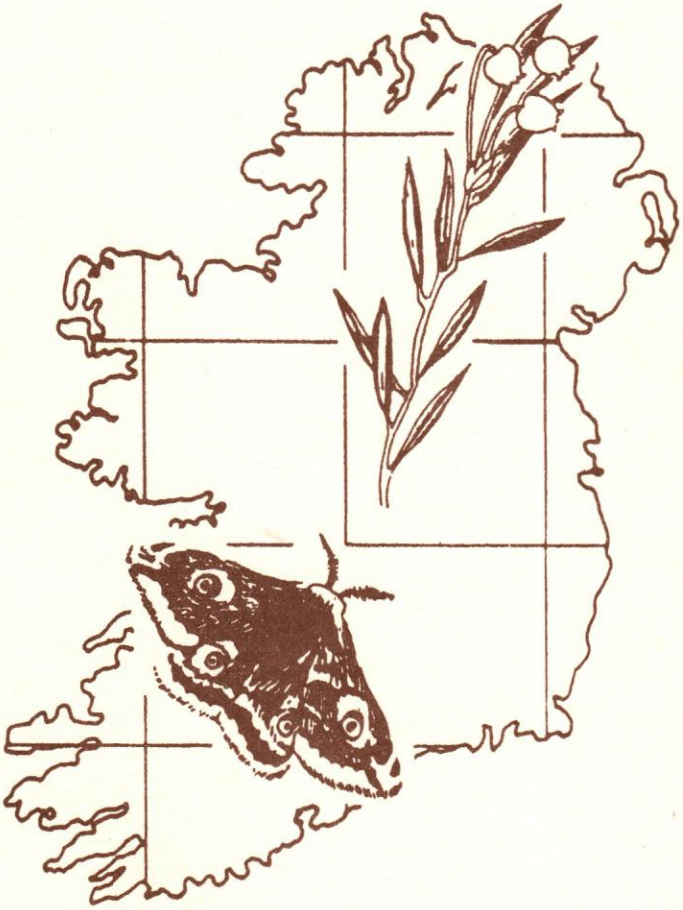
IRISH BIOGEOGRAPHICAL SOCIETY



Bulletin No. 27

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BULLETIN OF THE IRISH BIOGEOGRAPHICAL SOCIETY

Number 27

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EDITORIAL

This year has been a very successful year for the Society and, as a result, it has been necessary to have *Bulletin* Number 27 sewn due to its large size. Altogether, it has been possible to include ten articles, four of which concern County Donegal. This area has often been neglected by Irish naturalists and it is very welcome therefore to be able to publish work on its biogeography. The remaining papers range over a very diverse mix of subjects and two chironomid species are added to the Irish fauna. We are indebted to the authors for their contributions.

The Society is grateful to Dr Pat Wallace, Director of the National Museum of Ireland, for his invaluable support, to the Ulster Museum for a grant towards the cost of publication of the marine macroalgal article and our sponsors for their generous and essential financial assistance. The Editor wishes to thank Mr J. M. C. Holmes for his hard work in producing the camera-ready copy and the Committee for its encouragement and friendship.

J. P. O'Connor
Editor
15 September 2003

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OCCASIONAL PUBLICATIONS OF THE IRISH BIOGEOGRAPHICAL SOCIETY

Number 1

Proceedings of The Postglacial Colonization Conference

D. P. Sleeman, R. J. Devoy and P. C. Woodman (editors)

Published 1986. 88pp. Price 3.81 euros*

Number 2

Biogeography of Ireland: past, present and future

M. J. Costello and K. S. Kelly (editors)

Published 1993. 149pp. Price 15.24 euros*

Number 3

A checklist of Irish aquatic insects

P. Ashe, J. P. O'Connor and D. A. Murray

Published 1998. 80pp. Price 7.62 euros*

Number 4

A catalogue of the Irish Braconidae (Hymenoptera: Ichneumonoidea)

J. P. O'Connor, R. Nash and C. van Achterberg

Published 1999. 123pp. Price 6.35 euros*

Number 5

The distribution of the Ephemeroptera in Ireland

M. Kelly-Quinn and J. J. Bracken

Published 2000. 223pp. Price 12.70 euros*

Number 6

A catalogue of the Irish Chalcidoidea (Hymenoptera)

J. P. O'Connor, R. Nash and Z. Bouček

Published 2000. 135pp. Price 10.16 euros*

The former Irish pound prices are given in euros. *To the rest of the world, please add 4 euros for postage.

Copies of these publications are available from the Irish Biogeographical Society, c/o Dr J. P. O'Connor, National Museum of Ireland, Kidare Street, Dublin 2, Ireland.

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THE MARINE MACROALGAE OF COUNTY DONEGAL, IRELAND

Osborne Morton

Ulster Museum, Botanic Gardens, Belfast BT9 5AB, Northern Ireland.

Abstract

A survey of all the available records, published and unpublished, of the macroscopic, marine algae of County Donegal has been completed. Records of the herbarium specimens in the Ulster Museum; Trinity College, Dublin; University College, Galway and the Natural History Museum, London have also been assembled. These records, along with those collected by the author, bring together for the first time a considerable amount of information concerning the distribution of these algae within the county. Without doubt there will be further data which are in other museum collections elsewhere or in unpublished documents and therefore the list may not be fully comprehensive.

Introduction

Purpose and coverage

Records of the marine algae of Co. Donegal are to be found stored in many different publications, surveys, museum records and herbaria. Many of these are not readily available to those wishing to research the algae of Ireland. The purpose is to bring together all such records of the marine algae of Co. Donegal. The sources of all the records are noted.

All available data on the marine algae in the three major Divisions Rhodophyta, Chlorophyta and Heterokontophyta (Phaeophyta), have been extracted and entered here. These include records of specimens in the herbaria of the Ulster Museum (BEL); Trinity College, Dublin (TCD); University College, Galway (GALW) and The Natural History Museum, London (BM); various publications; the *BioMar* project and from excursions by the author. Altogether, this compilation gives an outline of the distribution of the marine algae of the county. Some records of Cyanophyta are included, but the coverage of this division is not a full appraisal.

The County Donegal shore environment

The shoreline of Co. Donegal includes the most northerly coast of Ireland, at Malin Head.

However, there are islands even further north – the Inishtrahull Islands. Much of the shore is exposed or very exposed. Nevertheless, there are a number of very sheltered loughs, such as Mulroy Bay and Lough Swilly, which penetrate deeply into the county and provide very sheltered conditions. A general discussion of environmental factors of the shores of the British Isles will be found in Lewis (1964). The rock is mainly schist or granite; with terraces of carboniferous limestone making up much of the shores of Donegal Bay.

In places, the shoreline is at the base of steep cliffs. Such areas cannot be examined except by diving, although strong wave action may make access difficult. Sheltered shores can be examined more often and in more detail, however, even here, in reasonably calm weather, strong waves can make collecting difficult, even dangerous at low water.

A survey of Rathlin O'Birne Island (G4780) was one of, if not the first, deepwater dives in Ireland. In 1980, two dives were made showing that algal communities existed to 32m below Chart Datum (Maggs and Guiry, 1982b). Since then, there have been further studies of the flora and fauna in the sublittoral elsewhere in the British Isles showing that species once thought to be rare and only recorded in the drift may be more common than realised.

The tidal range at Gweedore is 11ft at spring tides and 5ft at neap tides. As a result of strong wave action on exposed sites, the littoral zone in Co. Donegal rises high on the shore, higher than in sheltered shores of the loughs (Lewis, 1964: p. 24). When considering the effects of temperature, it is necessary to bear in mind both the water temperature and the air temperature. Air temperature as a factor influencing distribution on the shores of the British Isles is discussed by Lewis (1964). At Malin Head, it is between 3.9°C. and 7.2°C. in winter and 10.6°C. and 16.1°C. in summer. The surface temperature is between 7°C. and 8°C. in winter and 14°C. and 16°C. in summer (Lewis, 1964: p. 32). However little is known of the actual air conditions (temperature and humidity) close to the surface of a rocky shore – the "microclimate". Although little work has been done on this matter, there is no doubt that conditions of sea and air temperature close to the surface differ considerably from records of the Meteorological Office. Lewis (1964) points out that once the tide has receded the speed of drying depends on the gradient of the slope, aspect of the site and frequency of rain. Other algae present will have an important effect as will the solar radiation. Larger Fucales will afford protection to finer species. Conditions on an unbroken shore will be different from those

of an irregular shore broken into gullies, pools and overhangs. In such areas, particularly on exposed shores of Donegal, the rate of drying will be different in areas shaded from sun, wind, spray and the aspect of the rock. The effect of the fauna plays an important part. Fucoids and barnacles compete for space. Along with barnacles *Semibalanus balanoides* (L.), the limpet population, dominated by *Patella vulgata* L., and other gastropods, is important. The grazing effect of gastropods, presumably limpets, is often clearly to be seen on coralline algae and other encrusting species. Their grazing over the rock surface, when the tide is in, prevents the attachment of young spores (Lewis, 1964).

History

Until recently, little work has been done on seaweeds. Plants which grow between tide marks could not be readily observed and then only in reasonably calm weather, while those below low tide could only be collected as "drift" specimens. Further, for many years, there was no keen body of enthusiastic amateurs to make a hobby of collecting and studying seaweed as there was for other groups of plants or animals. Harvey (1811 – 1866) does, however, stress his indebtedness to amateurs in his *Manual of British Algae* (1841). Sawers was one of the earliest to make a study of algae anywhere in Ireland, publishing in 1854 a paper entitled "List of algae gathered in the north of Ireland". He collected the specimens in Loughs Foyle and Swilly, but unfortunately did not record from which lough and one cannot therefore be sure of the county. Lough Swilly is entirely in Co. Donegal but, while the western side of Lough Foyle is in the same county, the eastern side is in Co. Londonderry. The western shore is rocky or stony and the eastern side is mainly shingle, mud or sand. It is thus fairly certain that most of his records are from the western, Co. Donegal, side.

It was common in the 19th Century to collect drift material, as diving for sublittoral specimens was quite impossible. However, such material was not always labelled as "drift". Sawers (1854) notes the *Taonia atomaria* which he found was "floating" and Morris (1854) also reports a specimen collected by Sawers as found "floating". These two papers were the first on the algae of Co. Donegal.

The species list of the British Isles has been increasing, partly as a result of recent research and partly by the invasion of certain species. The best known of these is *Sargassum muticum* (Yendo) Fenholt (Boaden, 1995). Fortunately it has not been recorded from Co. Donegal

although it is common in Strangford Lough, Co. Down and on the south coast of England. Other species, not native to the British Isles, have been found in Ireland, among them: *Colpomenia peregrina* (Sauvageau) Hamel; *Asparagopsis armata* Harvey; *Bonnemaisonia hamifera* Hariot and *Codium fragile* (Suringar) Hariot. Farnham (1980), although referring to the south of England, gives examples of species which are now to be found in Ireland. Other species are not new as such but result from research which has shown that two species which were once considered to be one are now known to be two or even more. In some cases, DNA research has brought about the necessary changes. An example of this is in the genus *Ceramium*. The species "*Ceramium rubrum*" was accepted in Park and Dixon's checklist (1976) as one species. However, some years later, Maggs and Hommersand (1993) stated this to be an illegitimate name covering four species. As this is a difficult taxon, no effort has been made by the author to redetermine old specimens and it is clearly not possible to redetermine published records not supported by voucher specimens. It has therefore been necessary to leave all records of "*Ceramium rubrum*" prior to 1983 as *Ceramium rubrum*.

The first known algal records from Co. Donegal are from Bundoran in 1840 - some, probably most, collected by G. C. Hyndman:- *Cryptopleura ramosa* (BEL: F7112); *Osmundea pinnatifida* (BEL: F7235); *Rhodomela lycopodioides* (BEL: F2684); *Gastroclonium ovatum* (BEL: F2669) and *Codium tomentosum* (BEL: F80). He noted a few others from Tory Island presumably collected by himself in 1845 or shortly earlier (Hyndman, 1853; Adams, 1913).

The Mapping Scheme organised by the British Phycological Society in the 1960s greatly encouraged collecting, recording and the bringing together of records for an atlas. The full atlas was never published, although a "Provisional Atlas..." edited by Norton was published in 1985. This shows the paucity of records from Co. Donegal. Since then there have been surveys of the Irish coast which have included sublittoral records of algae collected by divers. These have greatly enlarged our knowledge of the species around Ireland and of their distribution. A new mapping scheme has now been completed and published (Hardy and Guiry, 2003).

Arrangement

In general, only the macro algae are recorded here. The nomenclature and classification adopted is based on the most recent checklist (Hardy and Guiry, 2003). The names in ***bold italics*** are those currently accepted, those in *italics* are well known synonyms, however no

attempt has been made to include all synonyms.

A short note about the species, or genera is in many cases included, as this may assist in the appreciation of the distribution and explain why the records of some taxa are so sparse although they may be not uncommon.

General distribution

For each species the general distribution in the North Atlantic is noted based mainly on South and Tittley (1986) and *The Seaweeds of the British Isles* (vols 1 – 4) along with other publications. Only general notes of the Atlantic distribution have been given. The comments on the distribution in Ireland are with special reference to Co. Donegal and are based on the records in Guiry (1978) and other publications such as the *Provisional Atlas of the Marine Algae of Britain and Ireland* (Norton, 1985). In that publication, *Fucus serratus* L., *F. spiralis* L. and *F. vesiculosus* L. are not shown in Co. Donegal at all. Many of the smaller species are without doubt under-recorded, in some cases partly because they cannot be identified with confidence and in other cases because they are small or parasitic.

The localities in Co. Donegal from which each species has been recorded are listed. These are, for the most part, arranged within fifteen "General Areas" which have been listed in a "clockwise" order around the Co. Donegal coast from Bundoran in the south to Londonderry in Lough Foyle (Fig. 1). Most of the records can be placed in one of these general areas and it is hoped that, by listing them in this manner, the reader will be able to obtain a general picture of the distribution of each species.

These General Areas are:-

1. **Donegal Bay**: from Bundoran to near Rathlin O'Birne.
2. **Rathlin O'Birne**: Rathlin O'Birne and the coast directly opposite.
3. **Gweebarra Bay**: the bay north of Rathlin O'Birne including the smaller bays and islands.
4. **Dunglow Bay**: the bay north of Gweebara Bay including Aran Island and north to, and including, Owey Island and Cruit Island.
5. **Inishfree Bay**: the bay north of Dunglow Bay at Gweedore, including the Stag Rocks north to the Bloody Foreland.
6. **Tory Island**: the island north of Inishbofin and about 15km north of Gortahork.

7. **Inishbofin Bay**: the island and mainland coast opposite Inishbofin; between Bloody Foreland and Sheephaven Bay.
8. **Sheephaven Bay**: the bay between Horn Head and Rosguill.
9. **Rosguill**: the peninsula of Rosguill, specifically the northern coast between Rinnafaghla Point and Melmore Head.
10. **Mulroy Bay**: the large convoluted bay between Melmore Head and Ballyhoorisky Point.
11. **Fanad**: a large peninsula on the north coast, especially the coast between Ballyhoorisky and Fanad Head.
12. **Lough Swilly**: the large lough on the north coast between Fanad Head and Malin Head.
13. **Inishtrahull**: an archipelago of small islands about 3km north of Inishowen.
14. **Inishowen**: the large peninsula between Loughs Swilly and Foyle, especially the coast between Malin Head and Dunagree Head.
15. **Lough Foyle**: the large lough between Inishowen and Co. Londonderry.

Some sites may be considered in two General Areas depending on the line separating the areas. Sites such as Ravedy Island (55°15.2'N. 07°46.8'W.) could be considered in Rosguill or Mulroy Bay.

Sites outside or between these "General Areas", such as Limeburners Rock, in the Atlantic north of Mulroy Bay are entered as was considered appropriate. Some sites are not shown on the Ordnance Survey maps and in some cases their location is uncertain. Sites within these General Areas are separated by semi-colons. The General Area is given first followed by the specific sites e.g. "Mulroy B. - The Narrows; Carrick B.; Deegagh Pt". Mulroy Bay is so contorted that little attempt has been made to arrange the sites within it in any order. A **bold slash** separates the different General Areas. In some of the old records, the collector noted only the general area, Mulroy Bay being a prime example. The Co. Donegal records, as referred to here, actually include a small part of Co. Londonderry on the west side of the River Foyle (Culmore and surrounding district), as this is an appropriate geographic and biological area.

Full details of the sites are often not given on some herbarium specimens or in some references and certain sites are to be found in more than one county. There is, for instance, a

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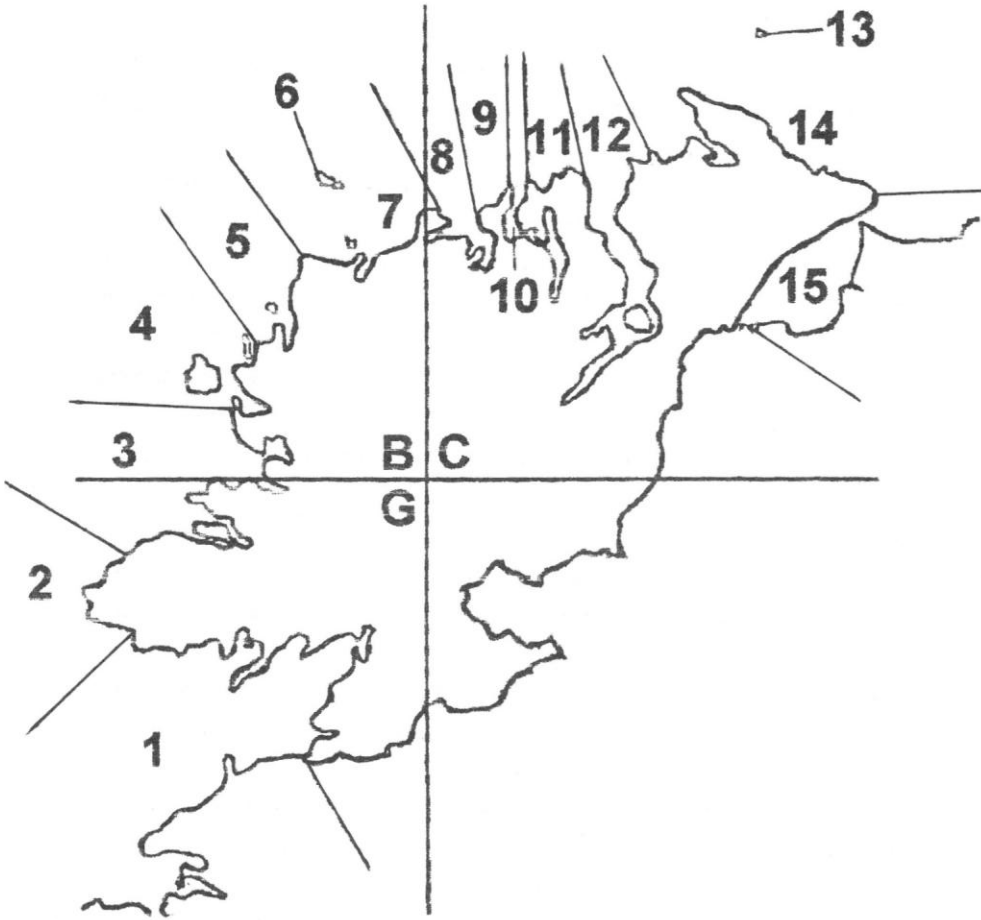
FIGURE 1. The General Areas.



Greencastle in Lough Foyle, Co. Donegal and at the entrance to Carlingford Lough in Co. Down. One of the most frustrating examples of this is "Blackrock". There are several Blackrocks in Co. Donegal as well as elsewhere in Ireland. Apart from this example, most sites not clearly indicated on a specimen or publication have been deduced from other information. "Bofin" was at first thought to be Inishbofin, the island off the north coast of Co. Donegal in Tory Sound. However other specimens clearly indicate that the "Bofin" referred is in Co. Galway.

The name "British Isles" is used in a general geographical sense and for convenience, although Ireland is not in "Britain". This is partly for reasons of simplicity and partly because it is used in this sense in many publications. It also includes the Isle of Man and Channel Isles.

In certain instances, the date of collection is not known and was not given by the collector. It obviously cannot be quoted, but a probable date may be suggested. Numbers preceded by the capital "F" are Ulster Museum (BEL) catalogue numbers and are unique to each specimen.

Taxonomic range

In general, only the macroscopic Rhodophyta, Chlorophyta and Heterokontophyta, with a few records of Cyanophyta from Co. Donegal, are included.

Symbols

, [comma] used where a site is detailed as near a well known locality e.g. "Magheragallon, Gweedore B.". It is also occasionally employed where a further note such as "subtidal" is added.

– [dash] follows the General Area detailing the records from within that area. Where several records are listed from the same General Area and from the same source, that source or reference is given at the end of the list of those records.

; [semi-colon] used between different records within the same General Area. It is also used within brackets where there are two sources of the actual record, e.g. two herbarium specimens or an herbarium specimen and a published record.

\ [bold slash] used after all the records from one General Area have been listed and before the next General Area is detailed.

& [ampersand] used where there are two records from the one site but collected at different times.

? [question mark] indicates an unconfirmed record.

( ) [round brackets] the sources of all records, whether publications, museum specimens or field records are within brackets. In some cases a record may be noted in more than one reference.

[ ] [square brackets] deduced or assumed details or information unconfirmed.

Abbreviations and contractions (used only in site records listed)

B. - Bay; BEL - Ulster Museum Herbarium; *BioMar* - the survey conducted under Mark Costello, see references; BM - Herbarium of the Natural History Museum, London; CD - Chart Datum; coll. - the collector of a specimen; comm. - communicated (by), i.e. either collected by or details provided by...; conf. - confirmed by...; det. - determined by...; E. - East; Hd - Head; I. (plural Is) - Island or Isle; L. - Lough; N. - North; *NILS* - Northern Ireland Littoral Survey; *NISS* - Northern Ireland Sublittoral Survey; *pers. comm.* - personal communication; Pt - Point; S. - South; TCD - Herbarium of Trinity College, Dublin; UCG - University College, Galway; W. - West.

Source of the records

Published references and unpublished research projects

Records have been extracted from all available published and unpublished sources. Guiry (1978) gave references to many publications. Since then, there have been many more giving further records. The *Provisional Atlas...* (ed. Norton, 1985) showed the sites of 155 species around the British Isles but indicated only the 10km grid square. In some, especially old publications, "cast up" or "drift" records were noted. However, it is probable that this was not always recorded. In general, drift specimens are not included here unless there are few records for the species. It seems that some collectors were mainly trying to catalogue all the different species and paid little attention to the exact site. The identification of some species is very difficult and they are poorly recorded, so they may be more common than the records indicate.

There are also unpublished records resulting from research projects such as the *BioMar* project. These are referred to in Italics: "(*BioMar*)". Some *BioMar* records are supported by voucher specimens in the herbarium of Trinity College, Dublin. Where there are two or more references for the same record, both may be given separated by a semi-colon within the brackets.

Shore excursions

Records were also made, mainly by the author, at various sites on the coast, not all of which are supported by voucher specimens. If a voucher specimen has been kept, it will be in the Ulster Museum Herbarium (BEL) and the catalogue number will be noted. These are shown giving the date of collection and initials (or name) of the recorder e.g. "1996 coll. OM". If they were determined or confirmed by another then "det." or "conf." followed by the initials (or name) is given. A list of the initials or full names of the collectors and determinors is given below.

Herbaria and voucher specimens consulted

If a specimen is stored in an herbarium, the abbreviated title of the herbarium is given followed by the catalogue number of the specimen if available. In some cases these support published records.

BEL Ulster Museum, Belfast. All the specimens in the herbarium are catalogued and the number, beginning with the letter "F" is given.

BM Natural History Museum, London.

TCD Trinity College, Dublin. As the main herbarium specimens are not catalogued, no reference number can be given. Those specimens which were collected in the *BioMar* project are numbered and the numbers are quoted.

UCG University College, Galway.

In the Ulster Museum, "(BEL: F1122)" indicates the specimen is stored in the Ulster Museum under the catalogue number "F1122". Other specimens are in the TCD Herbarium and are noted in a similar manner. If they are part of the *BioMar* project the number on the specimen sheet is given "(TCD: A900)" with the initials of the collector and determiner where available. Records from UCG are also noted giving their catalogue numbers.

Collectors and determiners (abbreviated)

ADC	Arthur Disbrowe Cotton	(1879 – 1962)
BEP	Bernard E. Picton	(*fl.* 1970s –)
CAM	Christine A. Maggs	(*fl.* 1970s –)
CCM	C. C. Morrow, (*BioMar*)	(*fl.* 1990s –)
CMH	C. M. Howson	(*fl.* 1980s –)

CSE	C. S. Emblow (*BioMar*)	(*fl.* 1990s -)
EM	E. Mooney	(*fl.* 1980s -)
EMS	E. M. Sides (*BioMar*)	(*fl.* 1970s -)
GCH	George Crawford Hyndman	(1796 - 1867)
HMP	H. M. Parkes	(1916 - 1992)
JB	J. Blomster	(*fl.* 1980s - 1990s)
JM	James A. Mahony	(*fl.* 1850s - 1880s)
JN	Julia Nunn	(*fl.* 1979 -)
KMD	Kathleen M. Drew	(*fl.* 1955s -)
McC	M. M. McCrea (*BioMar*)	(*fl.* 1990s -)
MdeV	M. de Valéra	(1912 - 1984)
MDG	Michael D. Guiry	(*fl.* 1969s -)
OM	Osborne Morton	(*fl.* 1968 -)
PD	P. Dinneen (*BioMar*)	(*fl.* 1990s -)
PT	P. Tierney (*BioMar*)	(*fl.* 1990s -)
WHH	William Henry Harvey	(1811 - 1866)
WFF	William F. Farnham	(1970s -)
WS	William Sawers	(*fl.* 1850s -)
YMC	Yvonne M. Chamberlain	(*fl.* 1970s -)

Collectors and determiners (not abbreviated)

Blackler	Margaret Constance Helen Blackler	(1902 - 1981)
Brenan	Samuel Arthur Brenan	(1837 - 1908)
Brennan	Agnes T. Brennan	(*fl.* 1943 - 1950)
Brown	R. Brown	(1773 - 1858)
Bustard	B. P. Bustard	(*fl.* 1970s)
Cary	Captain Cary	(*fl.* 1860s)
Connor	D. Connor	(*fl.* 1980s)
Dickinson	Carola Ivena Dickinson	(1900 - 1970)
Duke	B. Duke	(*fl.* 1915)
Hyndman	Miss Hyndman	(*fl.* 1800s)

Irvine	Linda M. Irvine	(*fl.* 1960s -)
Johnson	T. Johnson	(1863 - 1954)
Kelly	K. S. Kelly	(*fl.* 1970s)
Lea	T. S. Lea	(*fl.* 1890s)
Lewis	J. R. Lewis	(*fl.* 1960s -)
Martin	Major A. Martin	(*fl.* 1850s)
Minchin	Dan Minchin	(*fl.* 1969 -)
Moore	D. Moore	(1807 - 1879)
Morrison	C. Morrison	(*fl.* 1850s)
Newroth	P. R. Newroth	(*fl.* 1960s - 1970s)
O'Sullivan	D. J. O'Sullivan	(*fl.* 1950s - 1970s)
Ovens	Mrs Ovens	(*fl.* 1850s)
Owens	Owens	(*fl.* 1850s)
Rea	Margaret Williamson Rea	(*fl.* 1875 - 1930s)
Roberts	Margaret Roberts	(*fl.* 1960s - 1970s)
Sawers	William Sawers	(*fl.* 1850s)
Scannell	Mary Josephine Patricia Scannell	(*fl.* 1972s -)
Sherwood	Alison Sherwood	(*fl.* 1990s -)
Silva	Paul C. Silva	(*fl.* 1950s - 1990s)
Steentoft	M. Steentoft	(*fl.* 1990s -)
Welch	Robert John Welch	(1859 - 1936)
Williams	A. Williams	(*fl.* 1980s)

RHODOPHYTA

Rhodophyceae

Goniotrichales

Goniotrichiaceae

***Colacodictyon reticulatum* (Batters) J. Feldmann**

synonym *Colaconema reticulatum* Batters

An endophytic alga which frequently colonises *Desmarestia dresnayi* (Fletcher, 1987).

N. Atlantic: France and the British Isles (South and Tittley, 1986). Newton (1931) refers to it as very rare.

Ireland: only one old record of it in Batters (1902). Very rare.

L. Foyle - Moville B. 1852 comm. Robertson (Batters, 1896 & others).

Erythropeltidales

Erthropeltidaceae

***Erythrotrichia carnea* (Dillwyn) J. Agardh**

A small simple filamentous epiphyte of the littoral and sublittoral. Probably generally distributed but, being small, overlooked.

N. Atlantic: Portugal to Britain and the Faroës (South and Tittley, 1986).

Ireland: several counties of Ireland (Guiry, 1978).

Gweebarra B. - Portnoo 2000 coll. & det. OM (BEL: F11897)\ L. Foyle - Whitecastle to Drung 1937/39 (Blackler, 1951).

***Porphyropsis coccinea* (J. Agardh ex Areschoug) Rosenvinge**

A small alga no more than 4cm long and usually epiphytic.

N. Atlantic: Portugal to Norway and Spitzbergen. On the coast of America from Canada to Connecticut (South and Tittley, 1986).

Ireland: several counties in Ireland (Guiry, 1978). Until recently considered very rare, now known to be under-recorded in Cos Down and Antrim having been recorded by the *NILS* and the *NISS* (Morton, 1994). Only one record from Co. Donegal.

L. Foyle - Greencastle on *Desmarestia aculeata* 1937/39 (Blackler, 1951).

Bangiales

Bangiaceae

***Bangia atropurpurea* (Roth) C. Agardh**

Probably a not uncommon species but rarely recorded. Mainly epilithic.

N. Atlantic: most European coasts including Iceland also Canada (South and Tittley, 1986).

Ireland: several counties in Ireland (Guiry, 1978), rarely recorded.

Donegal B. - Murles [Pt] 1978 coll. MdeV (BEL: F1816)\ Mulroy B. - Gortnalughoge 1952/55 (Parkes, 1958a)\ L. Foyle - Greencastle to Moville 1937/39 (Blackler, 1951).

***Porphyra* C. Agardh**

The different species of *Porphyra* are not easily distinguished, and some may be confused and under-recorded. Most require taxonomic investigation.

***Porphyra laciniata* (Lightfoot) C. Agardh**

United under *P. purpurea* in many references, the relationship requires further investigation (Guiry, 1997).

N. Atlantic: not included in South and Tittley (1986).

Ireland: possibly recorded under *P. purpurea*, further research required.

Fanad - Ballyhoorisky (Brennan, 1950)\ Inishowen - Pollan B. (Brennan, 1950).

***Porphyra leucosticta* Thuret**

Epilithic and epiphytic in the littoral and sublittoral. Probably common but under-recorded.

N. Atlantic: distributed on both sides of the Atlantic in Europe and North America (South and Tittley, 1986).

Ireland: first recorded in Ireland at Larne and Murlough Lough by Hanna (1899), recorded from several counties in Ireland (Guiry, 1978). There is, however, only one recent record from Co. Donegal. Common in Northern Ireland (Morton, 1994).

Donegal B. - Murles Pt 1994 coll. & det. MDG (UCG: 008906 & *BioMar*).

***Porphyra linearis* Greville**

synonym *Porphyra umbilicaris* var. *linearis* Greville

A small narrow frond in the upper littoral, only found in the winter and spring.

N. Atlantic: Europe from Portugal to the Shetlands including Britain. North America, widely distributed around Newfoundland (South and Hooper, 1980; South and Tittley, 1986).

Ireland: only two records from Co. Donegal, but as a species of winter and spring, possibly more common. Frequent in Co. Antrim (Morton, 1994).

Mulroy B. - Ballyhoorisky Hd (Brennan, 1945 as *Porphyra umbilicaris* var. *linearis* Grev.) & 1944 coll. MdeV det. MDG (UCG: 007164)\ Melmore Hd (near) pre-1985 (Norton, 1985).

***Porphyra purpurea* (Roth) C. Agardh**

This species requires taxonomic investigation (Guiry, 1997). Littoral, epiphytic and epizoic.

N. Atlantic: Canada and Europe including Britain and Ireland (South and Tittley, 1986).

Ireland: most coastal counties in Ireland (Guiry, 1978). Probably more common than these records indicate; almost all records from Northern Ireland were by *NILS* (Morton, 1994).

Inishowen - Dunagree Pt 1998 coll. & det. OM (BEL: F11670).

***Porphyra umbilicalis* (Linnaeus) Kützing**

Similar to the other species of *Porphyra*. Littoral, epilithic.

N. Atlantic: much of Atlantic Europe, Iceland and Eastern Canada (South and Tittley, 1986).

Ireland: most coastal counties of Ireland (Guiry, 1978).

Donegal B. - Fintragh B. 1999 coll. & det. OM (BEL: F11841)\ Mulroy B. - Ballyhoorisky 1944 coll. MdeV det. MDG (UCG: 007174); Gortnalughoge & Ballyhoorisky Pt 1952/1955 (Parkes, 1958a)\ L. Swilly - Portnagarribane 1993 (*BioMar*)\ Inishowen - Carrickabraghy 1996 coll. McC det. MDG (TCD: A892; A893)\ L. Foyle - Greencastle; Saltpans Rock 1937/39 (Blackler, 1951).

Acrochaetiales

Acrochaetiaceae

***Acrochaetium* Nägeli**

synonym *Audouinella* Bory

Probably one of the most confused of all the marine Rhodophyta found in the British Isles (Dixon and Irvine, 1977), a number of the species require re-investigation. Most of the specimens are small, finely branched and difficult to identify, possibly all are under-recorded.

***Acrochaetium endozoicum* (Darbishire) Batters**

synonym *Audouinella endozoicum* (Darbishire) P. S. Dixon

An endozoic species in Bryozoa in the sublittoral. Widely distributed.

N. Atlantic: Europe from France to the coasts of the British Isles (Dixon and Irvine, 1977), but no further north than Scotland (South and Tittley, 1986).

Ireland: only one Co. Donegal record.

L. Foyle - Greencastle 1937/1939 (Blackler, 1951).

***Acrochaetium secundatum* (Lyngbye) Nägeli**

synonym *Audouinella secundata* (Lyngbye) Dixon

A very small epiphytic species, no more than 2mm long. Recorded under various synonyms on both sides of the Atlantic (South and Tittley, 1986). The relationship with *A. virgatulum* has been questioned by various authors (Dixon and Irvine, 1977).

N. Atlantic: generally distributed on both sides of the Atlantic and around the British Isles (Dixon and Irvine, 1977).

Ireland: recorded from Counties Clare, Cork, Donegal, Dublin, Galway, Mayo (Guiry, 1978).

L. Foyle - Greencastle 1937/39 (Blackler, 1951: as *Chromastrum secundatum*).

***Acrochaetium virgatulum* (Harvey) Bornet**

synonym *Audouinella virgatula* (Harvey) Dixon

A small alga, no more than 7mm long. The relationship with *A. secundatum* has been questioned (Dixon and Irvine, 1977).

N. Atlantic: Europe from Portugal to the Faroës, also Iceland and Greenland (South and Tittley, 1986).

Ireland: recorded under various names from many counties (Guiry, 1978).

Mulroy B. 1952/55 (Parkes, 1958b)\ L. Foyle - Greencastle 1937/39 (Blackler, 1951).

***Rhodochorton* Nägeli**

***Rhodochorton purpureum* (Lightfoot) Rosenvinge**

synonym *Audouinella purpurea* (Lightfoot) Woelkerling

Included in *Audouinella* by Guiry (1997) but now returned to genus *Rhodochorton*. The species is not easy to distinguish from *Rhodothamniella floridula*, both form erect filaments up to 3cm long. Not often recorded but probably not uncommon.

N. Atlantic: Europe from Portugal, Iceland and Greenland. North America from Canada to Connecticut (South and Tittley, 1986).

Ireland: several counties of Ireland (Guiry, 1978).

Gweebarra B. - Inishkeel 2000 coll. & det. OM (BEL: F11925 & ?F11926)\ L. Foyle - Saltpans Rock; Clare I.; Redcastle; Drung & Whitecastle 1937/39 (Blackler, 1951).

***Colaconema daviesii* (Dillwyn) Stegenga**

synonym *Acrochaetium daviesii* (Dillwyn) Nägeli

synonym *Audouinella daviesii* (Dillwyn) Woelkerling

Known to be virtually cosmopolitan (Dixon and Irvine, 1977). Erect branches tufted up to 1cm long, in the littoral and sublittoral, epiphytic.

N. Atlantic: Europe from Portugal to the Faroës and in North America from Newfoundland to Virginia (South and Tittley, 1986).

Ireland: generally distributed around the Irish coasts (Guiry, 1978) but no recently confirmed records from Co. Donegal.

Gweebarra B. - Portnoo 2000 coll. & det. OM but not confirmed (BEL: F11903)\ L. Foyle - Greencastle 1937/39 (Blackler, 1951) & Moville 1855 coll. WS (McMillan and Morton, 1979).

Palmariales

Palmariaceae

***Palmaria palmata* (Linnaeus) O. Kuntze**

synonym *Rhodymenia palmata* (Linnaeus) Greville

vernacular name Dulse

A common and well known alga, edible and to be bought in shops in Ireland. Epilithic and epiphytic, from mid to low-littoral and sublittoral, often growing on the stipes of *Laminaria*.

N. Atlantic: Azores to Spitzbergen, Iceland and Greenland. North America from eastern Canada to New Jersey (South and Tittley, 1986).

Ireland: abundant. First Co. Donegal record dated 1894. The 1854 record of Sawers may not be from Co. Donegal.

Donegal B. - Murles Pt 1994 (*BioMar*); Bunatrahan 2002 coll. & det. OM; promontory between Inver B. & McSwyne's B. 1894 (Duerden, 1895); Kiln Port 1999 coll. & det. OM; near St John's Pt 1999 coll. & det. OM; Rolagh, Kilcar 1980 coll. EM det. MDG (UCG: 006505)\ Gweebarra B. - Rossbeg and Portnoo 1955 coll. KMD (BM); Portnoo 2000 coll. & det. OM\ Inishfree B. - Rinageeagh Pt 1967 coll. & det. OM (Morton, 1967); Brinlack Port

1996 coll. McC & det. MDG (TCD: A939)\ Limeburners 1993 (*BioMar*)\ Sheephaven B. - Port-na-Blagh 1996 coll. & det. OM (BEL: F11286)\ Mulroy B. - between Drumnacraig & Invermore B.; Scoltnamaddy B. 1952/55 (Parkes, 1958a); Pan B.; White Mares B.; W. of Ballyhoorisky I. 1993 (*BioMar*)\ Fanad - E. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11348)\ L. Swilly - Ballyhoorisky Pt; Portnagarribane; Great Pollet Arch 1993 (*BioMar*); N. Ballymastocker B. 1997 coll. & det. OM\ Inishowen - Carrickabraghy 1996 coll. & det. MDG (TCD: A937; A935; A882; A883 & A899); Dunagree 1998 coll. & det. OM\ L. Foyle - Greencastle; Glenbyrnie; Ravenscliffe Reef 1937/39 (Blackler, 1951). The record in Sawers (1854) may be from L. Swilly or Foyle.

***Meiodiscus spetsbergensis* (Kjellman) Saunders et McLachlan**

synonym *Audouinella spetsbergensis* (Kjellman) Woelkerling

Small erect axes no more than 5mm (Dixon and Irvine, 1977). Epizoic and epiphytic in the sublittoral.

N. Atlantic: Spain to Spitzbergen, Iceland and Greenland. In North America from Canada to New Hampshire.

Ireland: recorded from Co. Donegal, undetailed, in Dixon and Irvine (1977) - no other Co. Donegal records.

Rhodothamniellaceae

***Rhodothamniella floridula* (Dillwyn) Feldmann**

synonym *Audouinella floridula* (Dillwyn) Woelkerling

synonym *Rhodochorton floridulum* (Dillwyn) Nägeli

A not uncommon alga in the low-littoral and sublittoral, often binding sand on rocks near sandy strands. Erect axes no more than 3cm long. Misidentification of *R. floridula* as *Rhodochorton purpureum* is not unlikely.

N. Atlantic: Atlantic coast of Europe from Spain to the Shetlands, around the British Isles, Spitzbergen, Greenland and Canada (South and Tittley, 1986; Dixon and Irvine, 1977).

Ireland: probably not uncommon, first recorded in Co. Donegal probably in the 1850s.

Donegal B. - Bunatrahan 2002 coll. & det. OM (BEL: F11967)\ Gweebarra B. - Portnoo 1955 coll. KMD (BM)\ Sheephaven B. - The Caskins 1996 coll. & det. OM conf. CAM (BEL: F11256; F11257; F11258)\ Inishowen - Dunagree Pt coll. & det. OM (BEL: F11665; F11666)\

L. Foyle - Moville coll. WS *circa* 1850s (BEL: F6414).

Ahnfeltiales

Ahnfeltiaceae

***Ahnfeltia plicata* (Hudson) Fries**

synonym *Porphyrodiscus simulans* Batters

Porphyrodiscus simulans is now known to be the tetrasporic phase in the life history of *Ahnfeltia* (Farnham and Fletcher, 1976). This tetrasporic phase is crustose while the gametangial phase is a small stiff black wire-like frond with few branches generally no more than several cms in length and often associated with sand. Although the crustose stage is not easily determined the gametangial phase, although small, cannot be confused with any other alga. Epilithic in low-littoral rock pools and the sublittoral. Generally distributed throughout the British Isles (Dixon and Irvine, 1977).

N. Atlantic: both sides of the Atlantic Ocean. Europe from the Azores north to the Faroës including the British Isles (South and Tittley, 1986).

Ireland: locally abundant. First recorded in Co. Donegal in 1886.

Donegal B. - Bunatrahan 2002 coll. & det. OM\ Gweebarra B. - Inishkeel 2000 coll. & det. OM (BEL: F11922)\ Inishfree B. - Brinlack Port 1996 coll. McC (TCD: A913)\ Sheephaven B. - Caskins 1996 coll. & det. OM (BEL: F11261); Downies 1886 coll. JM (BEL: F3368)\ Mulroy B. - Ballyhoorisky Pt 1993 (*BioMar*)\ Fanad - E. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11356; F11357)\ Inishowen - Pollan B. pre-1950 (Brennan, 1950); Dunagree Pt 1998 coll. & det. OM (BEL: F11668)\ L. Foyle - Moville to Whitecastle 1937/39 (Blackler, 1951). The record in Sawers (1854) may be from L. Foyle or Swilly.

Nemaliales

Galauxauraceae

***Scinaia* Bivona-Bermardi**

S. furcellata and *S. interrupta* were until 1926 considered to be one species. Old records not supported by voucher specimens are not included.

***Scinaia furcellata* (Turner) J. Agardh**

synonym *Scinaia forcellata* Bivona-Bernardi

including *Scinaia pseudocrispa* (Clemente) Cremades et Perez-Cirera

synonym *Ginnania furcellata* Montagne

Epilithic in the sublittoral. This species has been separated into two subspecies: *forcellata* and *scandinavica*. The latter is confined to Scandinavia while subsp. *forcellata* is of south-western coasts of Britain (Maggs and Guiry, 1982a) and in Ireland no further north than Co. Clare (Batters, 1902), since then a specimen has been found in Co. Donegal.

N. Atlantic: from the Atlantic coasts of North America and Europe (South and Tittley, 1986).

Ireland: very rare.

Dunglow B. - Toninishgun Pt 1997 coll. EMS det. CAM as *S. pseudocrispa* (TCD: A1168).

***Scinaia interrupta* (A. P. de Candolle) M. J. Wynne**

synonym *Scinaia turgida* Chemin

Listed as *Scinaia trigona* (Clemente y Rubio) Trevisian in Guiry (1997). Generally a south-western species of the sublittoral to depths of 30m (Dixon and Irvine, 1977).

N. Atlantic: a south-western species of European shores (Dixon and Irvine, 1977). Maggs and Guiry (1982a) refer to it as quite common in some areas of clear water and, although considered rare, it may be more common in the sublittoral.

Ireland: rare, has also been reported from the shores of Northern Ireland (Morton, 1994). Records dating from 1853.

Donegal B. - St John's Pt 1984 coll. & det. CMH (BEL: F5229)\ Tory I. - SW of Carrickadda 1995 coll. EMS det. MDG (TCD: A364)\ Foyle - Moville 1853 coll. WS conf. CAM as *Scinaia turgida* (McMillan and Morton, 1979; BEL: F1568) & between Moville & Greencastle 1853 coll. & det. WS as *Ginannia furcellata* det. OM as *S. turgida* (BEL: F6477).

***Helminthora divaricata* (C. Agardh) J. Agardh**

synonym *Helminthora stackhousei* (Clemente) Cremades et Perez-Cirera

The gametangial plants grow to 25cm however the tetrasporic plants have only been reported in culture: "discoid or filamentous growth with large cells" (Dixon and Irvine, 1977). Epiphytic in the sublittoral, very rare.

N. Atlantic: generally distributed along the Atlantic shores of Europe including the Britain Isles

and the Shetlands (South and Tittley, 1986).

Ireland: recorded from several counties in Ireland (Guiry, 1978).

Dunglow B. - Aranmore 1944 coll. & det. MdeV (UCG: 005361)\ Fanad - Doagh Beg drift 1998 coll. & det. CAM (BEL: F11628)\ Inishowen - Tullagh B. 1943 coll. & det. MdeV (UCG: 005359).

***Nemalion helminthoides* (Valley) Batters**

A very gelatinous alga, rather brown in colour. The complete life history has not yet been fully established. Epilithic in the midlittoral (Dixon and Irvine, 1977).

N. Atlantic: Europe from the Azores to the British Isles and Norway, and in North America from Quebec to Connecticut (South and Tittley, 1986).

Ireland: common in places.

Donegal B. - Bundoran 1891 coll. Lea (BM); Rolagh, Kilcar 1980 coll. EM det. MDG (UCG: 006267)\ Gweebarra B. - Portnoo 2000 coll. & det. OM\ Dunglow B. - Wyon Pt 1997 coll. EMS det. CAM (TCD: A1174)\ Inishfree B. - Bunbeg 1944 coll. & det. MdeV (UCG: 006273)\ Mulroy B. - 1952/55 (Parkes, 1958b); Dundooan Rocks 1993 coll. CSE det. MDG (TCD: A63); Ballyhoorisky I. 1993 (*BioMar*)\ L. Swilly - Portnagarribane & Great Pollet Arch 1993 coll. & det. CSE (TCD: A51)\ Inishowen - Carrickabraghy 1996 coll. McC (TCD: A903)\ L. Foyle - Greencastle & Drumaweir 1937/39 (Blackler, 1951).

Gelidiales

Gelidiaceae

Three members of the genus *Gelidium* are included in Dixon and Irvine (1977): *G. pusillum*; *G. latifolium*; and *G. sesquipedale*, these authors considered *G. pusillum* to include also *G. crinale* and *G. pulchellum* and *G. latifolium*. South and Tittley (1986) apparently agreed with this. Hardy and Guiry (2003) list six species: *G. corneum*, *G. crinale*, *G. maggsiae*, *G. pulchellum*, *G. pusillum* and *G. spinosum*. *G. maggsiae* Rico et Maggs was described as a new species (Rico and Guiry, 1997), and it is known only from Co. Galway. Guiry notes that the genus "requires further revision".

As identification is difficult and the synonymy complex, all the records noted below are to be considered with caution. On recent visits (2000) to the Gweebarra area, specimens of this genus

were found to be more common and well grown than in Northern Ireland. The general distribution as given below is based on South and Tittley (1986).

***Gelidium spinosum* (S. G. Gmelin) P. C. Silva**

synonym *Gelidium latifolium* Bornet et Thuret

The few records in the literature are under the name of *G. corneum* which may refer to *G. latifolium* agg. or *G. latifolium*. The determinations of old specimens is doubtful. Lower littoral and sublittoral, generally uncommon.

N. Atlantic: Europe from the Azores to Norway (South and Tittley, 1986).

Ireland: in places sporadically quite common. First recorded in Co. Donegal by Sawers about or before 1850s.

Gweebarra B. – Rossbeg 2000 coll. & det. OM (BEL: F11918); Inishkeel 2000 coll. & det. OM\ Mulroy B. – Knox's Hole 1993 as *G. latifolium* (*BioMar*); Ballywhooriskey 1942 coll. & det. MdeV\ L. Swilly – Buncrana *circa* 1850s coll. WS (BEL: F6455; F6456)\ Inishowen – Whitestrand B. 1943 coll. & det. MdeV (UCG: 004847)\ L. Foyle – Moville & Saltpans 1937/1939 (Blackler, 1951) both records as *G. corneum*\ Inishowen – Bulbinbeg 1998 coll. & det. OM (BEL: F11637; F11638). The record in Sawers (1854) may be from L. Swilly or Foyle.

***Gelidum pulchellum* (Turner) Kützing**

Dixon and Irvine (1977) included *G. pulchellum* under *G. pusillum* agg. Hardy and Guiry (2003) record it as a separate species and do not accept the opinion of Dixon and Irvine.

N. Atlantic: uncertain.

Ireland: very rare, only one Co. Donegal record.

Inishbofin B. – Meenclady 1996 coll. McC det. MDG (TCD: A868).

***Gelidium pusillum* (Stackhouse) Le Jolis**

This species is included in Dixon and Irvine (1977) and in Guiry (1997). Epilithic in the mid to lower littoral.

N. Atlantic: generally distributed on both sides of the Atlantic from the Azores to the British Isles and U.S.A. (South and Tittley, 1986).

Ireland: not uncommon but poorly recorded in Co. Donegal. Probably first recorded before the 1880s by J. Mahony.

"Donegal" (undetailed – probably pre-1880s) coll. JM as *G. cornecum* (BEL: F3464)\ Donegal B. – Doorin Pt 2002 coll. OM (BEL: F11954); St John's Pt 1999 coll. & det. OM (BEL: F11824); Fintragh B. 1999 coll. & det. OM (BEL: F11840)\ Gweebarra B. – Portnoo 2000 coll. & det. OM (BEL: F11905); Rossbeg 2000 coll. & det. OM (BEL: F11915)\ Sheephaven B. – The Caskins 1996 coll. & det. OM (BEL: F11280)\ Inishtrahull 2000 coll. JN det. OM (BEL: F11938)\ L. Foyle – N. Moville 1937/39 (Blackler, 1951)\ White Strand B. [there are two bays named "White Strand Bay"] (Brennan, 1950).

***Pterocladiella capillacea* (S. G. Gmelin) Santelicies et Hommersand**

synonym *Pterocladia capillaceae* (S. G. Gmelin) Bornet

Epilithic in deep pools in the low littoral and sublittoral (Dixon and Irvine, 1977; Norton, 1985). Very rare.

N. Atlantic: a southern species distributed along the Atlantic shores coasts of Europe, from the Azores north to Ireland and England (South and Tittley, 1986).

Ireland: several counties in the west (Guiry, 1978).

Dunglow B. – N. Cruit I. 1944 coll. MdeV det. MDG (UCG: 007250).

Gracilariales

Gracilariaceae

Confusion between *Gracilaria gracilis* (Stackhouse) Steentoft, Irvine et Farnham (as *Gracilaria verrucosa* (Hudson) Papenfuss or *Gracilaria confervoides* (L.) Greville) and *Gracilariopsis longissima* (Gmelin) Steentoft, Irvine et Farnham has led to uncertainty concerning the distribution of the species of this family (Steentoft and Farnham, 1997). Further, populations are mobile on pebbles and shells while others are drift. Unless recently confirmed, the following records should be viewed with caution.

***Gracilaria gracilis* (Stackhouse) Steentoft, L. M. Irvine et Farnham**

synonym *Gracilaria confervoides* (Linnaeus) Greville, *nom. illeg.*

synonym *Gracilaria verrucosa* (Hudson) Papenfuss

This species has been recorded growing mainly on bedrock but also on pebbles and shells. Perennial in the intertidal and in lagoon-like areas (Steentoft and Farnham 1997). Although there are no records from Co. Donegal, it is included here because of possible confusion with

Gracilariopsis longissima.

N. Atlantic: Ireland, England, Wales, France, Netherlands, Denmark, Norway and Sweden. Some of these records however are of "mobile populations" which can "appear and disappear". It seems that the northern boundary of the immobile populations in Europe is on the Boulonnais coast of France (Steentoft and Farnham, 1997). Steentoft did not find any specimens collected in the last 30 years in the BEL herbarium (*pers. comm.* 1996).

Ireland: there are records from Ireland, however none from Co. Donegal.

***Gracilariopsis longissima* (S. G. Gmelin) Steentoft, L. M. Irvine et Farnham**

This species chiefly grows in similar habitats to *G. gracilis* on rock, but often on shells and pebbles down to 15m in the sublittoral. The most northern records are from Scotland and Ireland, it has been occasionally found in southern England.

N. Atlantic: Germany, Netherlands, Denmark, Ireland, England and Scotland (Steentoft and Farnham, 1997).

Ireland: no recent records confirmed by Steentoft.

Dunglow B. - Wyon Pt 1997 coll. EMS det. CAM (TCD: A1172)\ Inishfree B. - Rutland South Channel 1996 coll. EMS det. MDG (TCD: A994) & coll. PT det. MDG (TCD: A1246 as *Gracilaria verrucosa*)\ Mulroy B. - Doaghmore Strand 1993 (*BioMar* as *G. verrucosa*)\ L. Swilly - Buncrana (BM)\ L. Foyle - 1852 coll. WS (McMillan and Morton, 1979 as *G. confervoides* var. *procerrima* BEL: F1511); Redcastle (dredged) 1937/39 (Blackler, 1951: as *G. confervoides*).

Bonnemaisoniales

Bonnemiasoniaceae

***Asparagopsis armata* Harvey**

synonym *Polysiphonia rufolanosa* Harvey

synonym *Falkenbergia rufolanosa* (Harvey) F. Schmitz

The gametangial and tetrasporangial phases of this species are quite different and were at first thought to be different species and were given different names: *Falkenbergia rufolanosa* as the tetrasporic phase and *Asparagopsis armata* the gametangial phase. Harvey (1855) originally described both phases from Australia (Farnham, 1980) under different names, (*F. rufolanosa*

under the name *Polysiphonia rufolanosa*). In Europe, the species was first found by Sauvageau in 1925 at Guethary and Cherbourg, France (Irwin *et al.*, 1975). As *Falkenbergia rufolanosa*, the tetrasporphyte, it was first recorded from the British Isles in 1939 in Galway harbour by M. de Valéra (Guiry *et al.*, 1979) and in 1941 the gametophyte (*Asparagopsis armata*) was found at two sites in Co. Galway (de Valéra, 1942). Since then it has been recorded from elsewhere in Ireland (Guiry *et al.*, 1979). *A. taxiformis* (Delile) Trev. may be conspecific, but further research is required (Farnham, 1980). Generally sublittoral, the gametangial phase is usually usually attached to other algae and the tetrasporangial phase usually epiphytic, epilithic or free floating (Dixon and Irvine, 1977).

N. Atlantic: Azores to the Shetlands and around the British Isles (South and Tittley, 1986).

Ireland: only the tetrasporic phase has so far been found in Co. Donegal and has not yet been recorded from Northern Ireland (Morton, 1994). Occasional, possibly both stages are spreading.

Gweebarra B. - Rossbeg near Portnoo 1955 coll. KMD (BM)\ Dunglow B. - Wyon Pt 1996 coll. EMS det. CAM (TCD: A1209)\ Mulroy B. - Millstone B. 1993 coll. EMS & det. CAM (TCD: A555)\ Inishowen - Carnalough 1957 coll. MdeV (Guiry *et al.*, 1979).

***Bonnemaisonia asparagoides* (Woodward) C. Agardh**

Like the previous species, this has two morphologically different phases in its life-history. The gametangial phase has a branched thallus up to 30cm in length while the tetrasporic phase is a prostrate crust. *Hymenoclonium serpens* is often referred to as the tetrasporic phase of *B. asparagoides*. However, the tetrasporic phase of *B. clavata* is indistinguishable from the *Hymenoclonium* phase of *Bonnemaisonia asparagoides* and therefore cannot be used as a synonym (Dixon and Irvine, 1977). First recorded in the British Isles in 1939 (Norton, 1985). Generally around the British Isles in the low littoral into the sublittoral (Dixon and Irvine, 1977).

N. Atlantic: Atlantic coasts of Europe from Portugal to Scotland and possibly Iceland (South and Tittley, 1986).

Ireland: recorded from ten counties (Guiry, 1978), all the records below are of the gametangial phase. Oldest Co. Donegal record is from Moville collected in 1855 by Sawers.

Donegal B. - Bundoran, drift, 1891 coll. Lea (BM); Studdagh Rock 1996 coll. & det. EMS

(TCD: A1149); S. of Muckross Hd 1996 coll. & det. EMS (TCD: A1032); SE of Carrigan Hd 1996 coll. & det. EMS (TCD: A1000)\ S. of Rathlin O'Birne 1996 coll. EMS det. MDG (TCD: A1223)\ Dunglow B. - E. of Toninishgun Pt 1996 coll. EMS det. CAM (TCD: A1231)\ Inishfree B. - Inishfree I. 1944 coll. & det. MdeV (UCG: 002849)\ Tory I. - E. Tomore 1995 coll. EMS det. MDG (TCD: A336); Rinnamorreeny 1995 coll. & det. EMS (TCD: A359)\ Inishbofin B. - Meenlaragh 1944 coll. & det. MdeV (UCG: 002851)\ Sheephaven B. - Duncap Is 1995 coll. & det. EMS (TCD: A320)\ Limeburners Rock 1993 (*BioMar*)\ Rosguill - E. Melmore Hd 1993 (*BioMar*)\ Mulroy B. - N. Ravedy I.; W. Knox's Hole; Deegagh Pt; White Mares B., Broadwater 1993 (*BioMar*)\ L. Swilly - S. side Anny Pt 1993 (*BioMar*)\ Inishtrahull - N. of Portmore 1995 coll. & det. EMS (TCD: A294)\ L. Foyle - Moville 1855 coll. WS (BEL: F6441); N. Moville, drift & Clare 1937/39 (Blackler, 1951).

***Bonnemaisonia hamifera* Hariot**

The gametangial phase of this species grows to 20 to 30cm in length while the tetrasporic phase, the *Trailliella* phase, forms monosiphonous filaments no more than 2cm long in small tufts.

This is a species of Japanese origin which became established in the north Atlantic Ocean towards the end of the 19th Century. The date of the first collection in the British Isles is not certain due to confusion between the tetrasporangial phase and a species of *Spermothamnion*. The first positive collection was made, as *Trailliella intricata* Batt., the tetrasporic phase, in Dorset in 1890 by Holmes (Batters, 1896). This tetrasporangial phase was recognised as *Trailliella intricata* prior to its association with *B. hamifera*. However, as the tetrasporangial phase of *B. nootana* (Esper) P. Silva, from the Pacific, is also recognised as "*Trailliella intricata*", this name cannot be cited as a synonym of *B. hamifera* (Dixon and Irvine, 1977). The records below are all of *Trailliella* and are considered to be *Bonnemaisonia hamifera*. Generally found in the low littoral and sublittoral.

N. Atlantic: Europe from France to the British Isles, Iceland and the Faroës. North America from Canada to Virginia (South and Tittley, 1986).

Ireland: recorded from five counties in Ireland (Guiry, 1978) with only two records from Co. Donegal but considered common in Northern Ireland by Morton (1994).

Mulroy B. - White Mares B. 1993 (*BioMar*); Gola More 1997 coll. & det. OM (BEL:

F11379).

***Naccaria wiggii* (Turner) Endlicher**

A sublittoral species growing to 25cm in height, southern distribution and very rare.

N. Atlantic: southwestern Europe from Spain, France, Ireland, England and Wales (South and Tittley, 1986).

Ireland: recorded from eight counties in Ireland (Guiry, 1978) but only once from Co. Donegal.

L. Foyle - Clare 1937/1939 (Blackler, 1951).

Cryptonemiales

Halymeniaceae

Grateloupia filicina* (J. V. Lamouroux) C. Agardh var. *filicina

Of the three species of *Grateloupia*, only this one is recorded from Ireland (South and Tittley, 1986). There are two varieties - *filicina* and *luxurians*, the latter is found in the south of England while the former occurs further north. Epilithic, littoral and sublittoral and widely distributed (Irvine, 1983).

N. Atlantic: European coasts to the British Isles and from North Carolina in the U.S.A. (Irvine, 1983).

Ireland: Guiry (1978) and Norton (1985) show records (of *G. filicina*) from southern counties but Irvine (1983) notes its distribution as "...northwards to Donegal". There is only one record from Co. Donegal. It has not been recorded from Northern Ireland (Morton, 1994).

Inishfree B. - Brinlack 1967 coll. OM conf. WFF (BEL: F2845).

***Halymenia latifolia* P. L. et H. M. Crouan ex Kützing**

According to Irvine (1983), this species has been recorded from a number of sites in the British Isles, some of which are based on misidentifications. Sublittoral and very rare.

N. Atlantic: Spain, Portugal and Ireland (South and Tittley, 1986).

Ireland: there is one record from Co. Galway (Irvine (1983) and we have one record from Co. Donegal.

Donegal B. - St John's Pt 1984 coll. & det. CAM (BEL: F5231).

Hildenbrandiales

Hildenbrandiaceae

***Hildenbrandia* sp.**

This genus consists of two very similar marine species, both encrusting on rock or stones from the upper littoral to the sublittoral. There is also a freshwater species (*H. rivularis* (Liebman) J. Agardh) not included here. The main difference between the two marine species, as described in Irvine and Chamberlain (1994), is the plane of cleavage of the tetraspores, a feature difficult to observe. Only *H. rubra* has been determined with confidence in Co. Donegal. The gametangial phase of the life history in unknown for both species. According to South and Tittley (1986), both species are found in Ireland.

Fanad - E. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11353; F11354)\ Inishowen - Bulbinbeg 1998 coll. & det. OM (BEL: F11635).

***Hildenbrandia rubra* (Sommerfelt) Meneghini**

A crustose epilithic alga forming stain-like patches on stones or rock in the littoral and sublittoral at all levels.

N. Atlantic: on the coasts of Europe from the Azores to the Faroës and throughout the British Isles to North America (South and Tittley, 1986; Irvine and Chamberline, 1994).

Ireland: frequent. The first record in 1854 may be outside Co. Donegal.

Mulroy B. - Gortnatraw B. 1993 (*BioMar*)\ L. Swilly - Great Pollet Arch 1993 (*BioMar*)\ Inishowen - Esky B. 1998 coll. & det. OM conf. Sherwood (BEL: F11656)\ L. Foyle - Carnagarve (dredged); Saltpans Rock; Drung to Whitecastle 1939/39 (Blackler, 1951). The record in Sawers (1854) may be from L. Swilly or L. Foyle.

Corallinales

Corallinaceae

A number of the Corallinaceae are difficult to identify with certainty and some of the following records, unless confirmed, should be considered with caution.

***Corallina* Linnaeus**

The species *Corallina elongata* and *C. officinalis* have on occasions been confused and misidentified, *Haliptilon squamatum* superficially resembles *C. elongata*.

***Corallina elongata* J. Ellis et Solander**

synonym *C. mediterranea* J. E. Areschoug

A species similar to *C. officinalis*. Low-littoral and sublittoral.

N. Atlantic: Europe as far north as Scotland (South and Tittley, 1986; Irvine and Chamberlain, 1994) but not on the shores of North America (South and Tittley, 1986).

Ireland: very rare.

Sheephaven B. – Port-na-Blagh 1996 coll. OM conf. Irvine (BEL: F11285).

***Corallina officinalis* Linnaeus**

One of the most common algae in rock pools from the littoral into the sublittoral. Dominant in shallow rock pools including those exposed to strong wave action.

N. Atlantic: Europe including Faroës, Iceland and Greenland and North America (South and Tittley, 1986).

Ireland: abundant, to be found on virtually every shore. First found in Co. Donegal in 1894.

Donegal B. – Bundoran 1975 coll. & det. OM; Murles 1978 coll. MdeV (BEL: F4103) also Murles Pt B. 1994 (*BioMar*); Doorin Pt 2002 coll. OM (BEL: F11952); on the E. coast of the promontory between Inver B. & McSwyne's B. 1894 (Duerden, 1895); Kiln Port 1999 coll. OM; near St John's Pt 1999 coll. & det. OM; Fintragh B. 1999 coll. & det. OM; Rolagh, Kilcar 1980 coll. EM det. MDG (UCG: 003900)\ Gweebarra B. – Portnoo 2000 coll. & det. OM; Inishkeel 2000 coll. & det. OM\ Inishfree B. – Gweedore B., near Magheragallon 1995 coll. & det. OM (BEL: F11202)\ Sheephaven B. – The Caskins 1996 coll. & det. OM (BEL: F11262)\ Limeburners Rock (*BioMar*)\ Fanad – W. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11340)\ Mulroy B. – Ballyhoorisky Is; Back Lough Narrows; Gortnatraw B. & Millstone B. 1993 (*BioMar*)\ Gola More 1997 coll. & det. OM\ L. Swilly – Great Pollet Arch 1993 (*BioMar*)\ Mulroy B. – Portnagarribane, Fanad (*BioMar*)\ Inishowen – Carrickbraghy 1996 coll. McC (TCD: A902); Esky B.; Bulbinbeg & Dunagree Pt 1998 coll. & det. OM\ Inishtrahull 2000 coll. JN det. OM\ L. Foyle – Greencastle; Moville; Saltpans Rock 1937/39 (Blackler, 1951).

***Jania rubens* (Linnaeus) J. V. Lamouroux**

There are two varieties: *rubens* and *corniculata* and, although both are found in Ireland, they are so similar they are not separated here. Epiphytic in the littoral and sublittoral.

N. Atlantic: European coasts of the Atlantic as far north as Norway (South and Tittley, 1986).
Ireland: west and south coasts (Guiry, 1978) with only two very old records from Northern Ireland (Morton, 1994). Very rare, first recorded in 1854.

Donegal B. - Murles Pt 1994 (*BioMar*)\ Sheephaven B. - Port-na-Blagh 1992 coll. OM det. Irvine as var. *rubens* (BEL: F10640) & det. OM (BEL: F10616)\ Mulroy B. 1952/55 (Parkes, 1958b)\ L. Foyle - Redcastle to Saltpans; Clare 1937/39 (Blackler, 1951). The record in Sawers (1854) may be from L. Swilly or Foyle.

***Lithophyllum incrustans* Philippi**

synonym *Lithothamnion incrustans* (Philippi) Heydrich

This species is not always easy to determine and some records should be considered with caution (Irvine and Chamberlain, 1994). Epilithic in rock pools of the littoral and sublittoral.
N. Atlantic: common on the Atlantic coast of Europe as far north as the Faroës (South and Tittley, 1986) and around the British Isles from the midlittoral into the sublittoral.
Ireland: very common, first recorded pre-1899.

Donegal B. - Bundoran 1891/98 (Johnson and Hensman, 1899 as *Lithothamnion incrustans*); St John's Pt 1999 coll. OM conf. YMC (BEL: F11831); Fintragh B. 1999 coll. OM det. YMC (BEL: F11844)\ Gweebarra B. - Portnoo 2000 coll. & det. OM (BEL: F11913)\ Dunglow B. - Gola Is 1891/98 (Johnson and Hensman, 1899: as *Lithothamnion incrustans*)\ Inishfree B. - Magheragallon, Gweedore B. 1995 coll. & det. OM (BEL: F11186; F11187 - not confirmed)\ Sheephaven B. - The Caskins 1996 coll. OM & conf. YMC (BEL: F11273); E. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11358) & W. Ballyhiernan B. 1997 coll. OM det. YMC (BEL: F11322) also (BEL: F11323 det. OM)\ Inishowen - Esky B. 1998 coll. & det. OM (BEL: F11661) & conf. YMC 1998 (BEL: F11662); Bulbinbeg 1998 coll. & det. OM (BEL: F11636)\ L. Foyle - Moville 1937/39 (Blackler, 1951).

***Lithophyllum orbiculatum* (Foslie) Foslie**

An encrusting species of the littoral. Possibly confused or identified as *L. incrustans*, noted as common in Irvine and Chamberlain (1994).
N. Atlantic: Atlantic shores of Europe including Iceland and in Canada (South and Tittley, 1986).
Ireland: probably common but poorly recorded, only one record from Co. Donegal. Recorded

as common in Northern Ireland (Morton, 1994).

L. Foyle – Storm Beach, Moville 1937/39 (Blackler, 1951: as *Pseudolithophyllum orbiculatum*).

***Titanoderma* Nägeli**

This name was in created in 1858 but ignored until it was restored in 1985, it is not used in Parke and Dixon's checklist (1976) but is used by Hardy and Guiry (2003). The algae are small, encrusting and difficult to determine. There are three species in the British Isles, one of which has four varieties (Irvine and Chamberlain, 1994). Two of these species have been recorded from Northern Ireland (Morton, 1994) and so far only one from Co. Donegal.

Ireland: Inishfree B. – Gweedore Bay 1995 coll. & det. OM as *Titanoderma* (BEL: F11208).

***Titanoderma pustulatum* (J. V. Lamouroux) Nägeli**

synonym *Dermatolithon pustulatum* (J. V. Lamouroux) Foslie

A littoral alga (Irvine and Chamberlain, 1994), almost certainly more common than the records suggest. There are four varieties in the British Isles, two of which are rare.

N. Atlantic: Europe from the Azores to Spitzbergen. North America from Canada to Connecticut (South and Tittley, 1986).

Ireland: apparently rare but small and probably much under-recorded.

Inishfree B. – Carnboy peninsula 1967 coll. & det. OM conf. YMC 1984 (BEL: F4068a)\ L. Foyle – Greencastle 1937/39 (Blackler, 1951: as *Lithophyllum pustulatum* f. *corallinae* (P. L. et H. M. Crouan) Foslie).

Titanoderma pustulatum* (J. V. Lamouroux) Nägeli var. *pustulatum

Possibly common but infrequently recorded. Epiphytic on *Chondrus*, *Mastocarpus* and holdfasts of *L. saccharina* and *F. serratus* (Irvine and Chamberlain, 1994).

N. Atlantic: Azores to Spitzbergen in Europe and Connecticut to Canada in America (South and Tittley, 1986).

Ireland: only one record, probably much under-recorded.

Inishowen – Bulbinbeg 1998 coll. OM conf. YMC (BEL: F11630 & F11631).

***Lithothamnion corallioides* (P. L. et H. M. Crouan) P. L. et H. M. Crouan**

Grows in two forms, as attached crustose plants and as unattached branched plants in maerl beds.

N. Atlantic: European coasts as far north as Scotland (South and Tittley, 1986). Quite common in places (Irvine and Chamberlain, 1994).

Ireland: several counties but with few records from Co. Donegal, probably more widespread.

Donegal B. - Black Rock, St John's Pt 1994 (*BioMar*)\ Mulroy B. - Pan B.; Mullaghanhardy Pt & Millstone B. 1993 (*BioMar*).

***Lithothamnion glaciale* Kjellman**

Low-littoral in shaded pools into the sublittoral to 34m (Irvine and Chamberlain, 1994). Generally easily identified and said to be common (Irvine and Chamberlain, 1994).

N. Atlantic: American and European shores as far north as the Faroës (South and Tittley, 1986).

Ireland: possibly common in the sublittoral but with few records from Co. Donegal.

Donegal B. - Black Rock, St John's Pt 1994 (*BioMar*)\ Mulroy B. - White Mares B. 1993 (*BioMar*).

***Melobesia membranacea* (Esper) J. V. Lamouroux**

A small but readily identified alga if looked at closely, often to be found epiphytic on *Furcellaria lumbricalis* and *Mastocarpus*.

N. Atlantic: North American and European coasts of the Atlantic (South and Tittley, 1986).

Ireland: very common.

Donegal B. - Bunatrahan 2002 coll. & det. OM; Fintragh B. 1999 coll. & det. OM (BEL: F11834)\ Gweebarra B. - Portnoo 2000 coll. & det. OM (BEL: F11902)\ Inishfree B. - near Carnboy 1967 coll. & det. OM 1967 & conf. YMC 1984 (BEL: F4068b)\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11263)\ Inishowen - Esky B. 1998 coll. & det. OM (BEL: F11657) & Dunagree Pt 1998 coll. & det. OM.

***Mesophyllum lichenoides* (J. Ellis) M. Lemoine**

A encrusting epiphyte of the low littoral and sublittoral.

N. Atlantic: European coasts of the Atlantic as far north as Scotland (South and Tittley, 1986; Norton, 1985).

Ireland: records indicate it to be a southern species (Guiry, 1978) but has been recorded in the 1980s from Derry, Antrim and Down (Morton, 1994). Occasional in Co. Donegal.

Donegal B. - Murles Pt 1994 (*BioMar*)\ Inishowen - Esky B. 1998 coll. OM conf. YMC

(BEL: F11660).

***Phymatolithon calcareum* (Pallas) Adey et D. L. McKibbin**

Found either as an attached crustose plant or an unattached branching thallus. Only the unattached plants have been found in the British Isles. The unattached plants are widely distributed, along with other species, as maerl in the sublittoral (Irvine and Chamberlain, 1994).

N. Atlantic: European coasts from Spain to the Shetlands (South and Tittley, 1986).

Ireland: first recorded pre-1899. Rare.

Donegal B. - Killybegs 1891/98 (as *Lithothamnion calcareum* (Harv.) Aresch.) (Johnson and Hensman, 1899)\ Mulroy B. - Knox's Hole 1993 (*BioMar*).

***Phymatolithon laevigatum* (Foslie) Foslie**

synonym *Lithothamnion laevigatum* Foslie

Epilithic encrusting thalli of the midlittoral to sublittoral. Not easily identified but generally distributed and very probably more common than indicated here (Irvine and Chamberlain, 1994).

N. Atlantic: European coasts, France to the Faroës, Iceland, Greenland and generally distributed around the British Isles. North America from Connecticut to Canada (South and Tittley, 1986; Irvine and Chamberlain, 1994).

Ireland: common, however few records for Co. Donegal. First recorded from Co. Donegal at Go Island pre-1899. Probably under-recorded.

Donegal B. - St John's Pt 1999 coll. OM conf. YMC (BEL: F11832)\ Gweebarra B. - Portnoo 2000 coll. & det. OM (BEL: F11914)\ Inishfree B. - Go I. pre-1899 as *L. laevigatum* Fosl. undated (Johnson and Hensman, 1899); Gola I. as *Lithothamnion laevigatum* Fosl. (Cotton, 1912; Lemoine, 1913).

***Phymatolithon lenormandii* (J. E. Areschoug) Adey**

The nomenclature of this species may have caused confusion in some of the old records, however more recent ones are supported by confirmed voucher specimens. Very common in both the littoral and sublittoral to 30m depth (Irvine and Chamberlain, 1994).

N. Atlantic: widely distributed on the Atlantic coasts of North America and Europe including Iceland and Greenland (South and Tittley, 1986). Southern England, Wales and Scotland -

however "woefully under-recorded" (Norton, 1985). Since then further study has shown it to be "common" in Northern Ireland (Morton, 1994).

Ireland: very common, first recorded 1894.

Donegal B. - Bundoran 1894 (Duerden, 1895); pre-1899 (Johnson and Hensman, 1899) & 1913 (Lemoine, 1913); Bunatrahan 2002 coll. & det. OM; Doorin Pt 2002 coll. OM (BEL: F11958); the E. coast of the promontory stretching between Inver B. & McSwyne's B. 1894 (Duerden, 1895); (undated) coll. Welch as *Lithothamnion polymorphum* (BEL: F373); St John's Pt 1999 coll. OM conf. YMC (BEL: F11831); Kiln Port 1999 coll. OM conf. YMC (BEL: F11846); Fintragh B. 1999 coll. & det. OM\ Gweebarra B. - Rossbeg 2000 coll. & det. OM (BEL: F11919); Inishkeel 2000 coll. & det. OM (BEL: F11930)\ Sheephaven B. - The Caskins 1996 coll. OM conf. YMC (BEL: F11274)\ Mulroy B. - Gola More 1997 coll. OM det. YMC (BEL: F11380; F11381; F11382 & F11383)\ Inishowen - Esky B. 1998 coll. & det. OM (BEL: F11663) & Dunagree Pt 1998 coll. OM & conf. YMC (BEL: F11674 & F11675)\ L. Foyle - Greencastle 1937/39 (Blackler, 1951).

***Phymatolithon purpureum* (P. L. et H. M. Crouan) Woelkerling et L. M. Irvine**

synonym *Lithothamnion polymorphum* (Linnaeus) Areschoug

An encrusting alga, very common in the littoral and sublittoral but much under-recorded.

N. Atlantic: Spain to France, the British Isles, Faroës, Spitzbergen and Canada (South and Tittley, 1986).

Ireland: very common. First recorded 1894.

Donegal B. - Bundoran coll. Welch (as *Lithothamnion polymorphum* BEL: F373) & coll. 1894 (Duerden, 1895); St John's Pt 1999 coll. OM conf. YMC (BEL: F11830 & F11831)\ Mulroy B. - Gola More 1997 coll. OM det. YMC (BEL: F11384)\ Inishowen - Dunagree Pt 1998 coll. OM & det. YMC (BEL: F11674).

Gigartinales

Calosiphonaceae

***Schmitzia hiscockiana* Maggs et Guiry**

This species was first described in 1985 by Maggs and Guiry (1985) who found it in the sublittoral at depths between 4 and 17m. Growing on mobile substrata such as pebbles and

cobbles (Karlsson, 1990).

N. Atlantic: known only from the British Isles and the western isles of Scotland to the Scilly Isles, with no records from the north or east of Britain (Maggs and Guiry, 1985).

Ireland: north-east, west and south Ireland (Maggs and Guiry, 1985). Only one record from Co. Donegal. Very rare.

Rathlin O'Birne area - Gloster Rock 1996 coll. & det. BEP (TCD: A1020).

Caulacantheceae

***Catenella caespitosa* (Withering) L. M. Irvine**

A small alga, no more than 2cm high, growing in the upper littoral *Pelvetia* zone where it may commonly be overlooked although abundant in places on sheltered shores.

N. Atlantic: generally distributed on the shores of Europe from the Azores to Iceland (Dixon and Irvine, 1977; South and Tittley, 1986) including the British Isles.

Ireland: common in the north-east of Ireland (Morton, 1994) and may be common, if looked for, in sheltered areas in Co. Donegal.

Donegal B. - Murles Pt 1994 (*BioMar*)\ Mulroy B. 1952/55 (Parkes, 1958b). The record in Sawers (1854) may be from L. Swilly or L. Foyle.

Choreocolacaceae

***Choreocolax polysiphoniae* Reinsch**

This small parasitic alga, no more than 1mm in diameter, grows on *Polysiphonia lanosa* but is not often recorded, probably because of its small size. As *P. lanosa* grows usually on *Ascophyllum* it will be generally found in more sheltered areas.

N. Atlantic: both sides of the Atlantic (South and Tittley, 1986) and from scattered localities in the British Isles (Irvine, 1983).

Ireland: having being looked for in Cos Down and Antrim, it has been commonly recorded in the last thirty years (Morton, 1994). It may be more common in Co. Donegal than this single record indicates.

L. Foyle - Greencastle 1937/39 (Blackler, 1951).

Cruoriaceae

***Cruoria pellita* (Lyngbye) Fries**

This species forms dark red crusts on rocks and mobile cobble substrates but not on maerl in

the sublittoral (Maggs and Guiry, 1989). It has been rarely recorded and some previous specimens have been misidentified (Dixon and Irvine, 1977).

N. Atlantic: Europe including Iceland and Greenland (South and Tittley, 1986) and widespread in the British Isles (Norton, 1985).

Ireland: well recorded Northern Ireland (Morton, 1994) but only one record from Co. Donegal. Rathlin O'Birne 1980 (Maggs and Guiry, 1982b).

Cystocloniaceae

***Calliblepharis ciliata* (Hudson) Kützing**

A southern and western species reaching it nothern limit in Mull in Scotland (South and Tittley, 1978). Epilithic, generally sublittoral (Dixon and Irvine, 1977). Rare.

N. Atlantic: Europe from Spain to Norway (Dixon and Irvine, 1977; South and Tittley, 1986) in western and southern coasts of Britain (Norton, 1985).

Ireland: common in the sublittoral in Northern Ireland (Morton, 1994) and probably generally elsewhere.

Donegal B. - S. of Doorin Pt 1994 (*BioMar*)\ Mulroy B. - White Mares B. 1993\ L. Swilly - Anny Pt 1993 (*BioMar*)\ Inishowen - Pollan B. 1943 coll. & det. Brennan (UCG: 003031)\ L. Foyle - Moville (dredged) 1937/39 (Blackler, 1951). The record in Sawers (1854) may be from L. Swilly or L. Foyle.

***Calliblepharis jubata* (Goodenough et Woodward) Kützing**

Generally a south-western alga. Epilithic and epiphytic in the lower littoral and upper sublittoral (Dixon and Irvine, 1977).

N. Atlantic: Europe from Portugal to Scotland (South and Tittley, 1986).

Ireland: generally distributed in Ireland but rare.

Donegal B. - Murles Pt 1978 coll. MdeV det. OM (BEL: F1837); 1994 (*BioMar*)\ Dunglow B. - NE Terman 1996 coll. McC det. MDG (TCD: A930)\ Mulroy B. 1952/55 (Parkes, 1958b).

***Cystoclonium purpureum* (Hudson) Batters**

A common species from the midlittoral to the sublittoral (Dixon and Irvine, 1977).

N. Atlantic: widespread in western Europe from Spain, Iceland to Greenland and in North America from Canada to New Jersey (South and Tittley, 1986). Common in the British Isles.

Ireland: common. First recorded in Co. Donegal in 1856.

Donegal B. - Bundoran 1891 coll. Lea (BM); Coolmore, Rossnowlagh 1955 coll. KMD (BM); Murles Pt 1994 coll. & det. MDG (UCG: 008898);1995 (*BioMar*); St John's Pt 1999 coll. & det. OM (BEL: F11821)\ Gweebarra B. - Portnoo 2000 coll. & det. OM (BEL: F11901); Inishkeel 2000 coll. & det. OM\ Dunglow B. - Illancrone I. 1996 coll. PT det. CAM (TCD: A1163); Aranmore Is 1944 coll. & det. Brennan (UCG: 004198)\ Inishbofin B. - Meenclady B. 1996 coll. McC det. MDG (TCD: A880)\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11295; F11275); Downies 1886 coll. JM (BEL: F3382; F3463; F3380; F3381)\ Inishfree B. - Brinlack 1996 coll. & det. McC (TCD: A875)\ Mulroy B. - 1952/55 (Parkes, 1958b); Mark's Pt (2) 1993 coll. EMS det. CAM (TCD: A564)\ L. Swilly - coll. WS (BEL: F6515); Portnagarribane 1993 coll. CSE det. MDG (TCD: A49)\ L. Foyle - Moville 1856 coll. WS (BEL: F3341); Greencastle to Drung; Redcastle & Clare 1937/39 (Blackler, 1951).

***Rhodophyllis* Kützing**

There may be more than one undescribed species not yet published. Some have been unofficially referred to as "*irviniana*" Guiry or "*Rhodophyllis* Big". Requires further investigation.

Donegal B. - Portnagh Rock 1996 coll. EMS det. CAM (TCD: A1226); cliffs to S. of Portnagh Rock 1982 coll. & det. BEP (BEL: F4022); St John's Pt 1982 coll. BEP conf. CAM (BEL: F4023; F4033) also coll. Connor & Williams det. BEP (BEL: F4020; F4021) & 1984 coll. & det. CMH (BEL: F5230); Studdagh Rock 1996 coll. CSE det. CAM (TCD: A1373 & A1374); Muckross Hd 1996 coll. EMS det. MDG (TCD: A1029); Carrigan Hd 1996 coll. CSE det. MDG (TCD: A1005 & A1006)\ Rathlin O'Birne - Rathlin O'Birne I. 1980 (Maggs and Guiry, 1982b); 1996 coll. & det. EMS (TCD: A1010)\ Tory I. - Tormore 1995 coll. BEP det. MDG (TCD: A362).

***Rhodophyllis divaricata* (Stackhouse) Papenfuss**

Sublittoral to at least 30m (Dixon and Irvine, 1977). Old records are probably drift specimens.

N. Atlantic: distributed along western European shores from Spain to Scotland (South and Tittley, 1986) including the British Isles.

Ireland: common in Northern Ireland in the sublittoral (*NISS*) and probably not uncommon in the sublittoral elsewhere. First recorded in Co. Donegal in 1886.

Donegal B. - Bundoran 1800s? coll. Miss Hyndman (BEL: F8307; TCD); Carrigan Hd 1996 coll. & det. CSE (TCD: A1003)\ S. of Doorin Pt 1994 (*BioMar*); St John's Pt 1982 coll. BEP & CMH conf. CAM (BEL: F4048 also UCG: 008589) & Portnagh Rock 1982 coll. BEP & CMH conf. CAM (BEL: F4032)\ Rathlin O'Birne, outside of Black Rock 1983 coll. CMH det. CAM (BEL: F4944)\ Tory I. - Tormore 1995 coll. EMS det. MDG (TCD: A361); W. of Marnid Pt 1995 coll. EMS det. MDG (TCD: A351); SW of Carrickadda coll. CSE det. MDG (TCD: A365)\ Mulroy B. - Knox's Hole; SW of Rough I.; Mullaghanhardy Pt 1993 (*BioMar*)\ L. Foyle - Greencastle 1856 coll. WS (BEL: F6605) & 1937/39 (Blackler, 1951); Ravenscliffe cast-up abundantly 1937/39 (Blackler, 1951).

Dumontiaceae

***Dilsea carnosa* (Schmidel) Kuntze**

A thick leathery alga easily determined and usually well recorded where it occurs. Epilithic and common in the low littoral and sublittoral to at least 24m (Irvine, 1983).

N. Atlantic: generally distributed on the Atlantic coast of Europe from Portugal to Spitzbergen and Iceland but not in America (South and Tittley, 1986). Few records for the east coast of England (Norton, 1985).

Ireland: common, but not nearly as common as *Palmaria palmata* which it vaguely resembles. First recorded in Co. Donegal in 1856.

Donegal B. - Bundoran 1891 coll. Lea (BM); Murles Pt 1994 coll. & det. MDG (UCG: 008881); Doorin Pt & W. of Rotten Rock 1994 (*BioMar*); near St John's Pt 1999 coll. & det. OM; Rolagh 1980 coll. EM det. MDG (UCG: 004560)\ Rathlin O'Birne 1980 coll. & det. CAM (UCG: 004477; Maggs and Guiry, 1982b)\ Gweebarra B. - Portnoo 2000 coll. & det. OM (BEL: F11899); Inishkeel 2000 coll. & det. OM\ Inishfree B. - Carnboy 1967 coll. & det. OM (BEL: F2861)\ Inishbofin B. - Meenclady B. 1996 coll. McC (TCD: A912)\ Rosguill - Outer Claddaghanillian B. 1993; Melmore Hd (*BioMar*)\ Mulroy B. - Ravedy I.; Knox's Hole; Back Lough Narrows & Tirloughan B. 1993 (*BioMar*); Dundeau 1871 coll. JM (BEL: F3453); Ballyhoorisky (Brennan, 1950)\ L. Swilly - Portnagarribane & Anny Pt 1993 (*BioMar*)\ Inishowen - Bulbinbeg 1998 coll. & det. OM (BEL: F11642)\ L. Foyle - Greencastle 1856

coll. WS (BEL: F6658) & Clare 1937/39 (Blackler, 1951).

***Dudresnaya verticillata* (Withering) Le Jolis**

Epilithic. Upper sublittoral to depths of at least 13m (Irvine, 1983).

N. Atlantic: widely distributed in Europe on southern and western shores from Spain to Scotland (South and Tittley, 1986). Well distributed in Britain on the southern and western shores (Irvine, 1983).

Ireland: Cork, Kerry, Galway and Mayo (Guiry, 1978) and recorded in Northern Ireland by the Sublittoral Survey (*NISS*). Rare, all records recent.

Dunglow - Inishmeal 1996 coll. & det. CSE (TCD: A1161); Toninishgun Pt 1997 coll. EMS det. CAM (TCD: A1169); South Channel 1996 coll. CCM (TCD: A1050)\ Mulroy B. - Scalpmore; Deegagh Pt; White Mares B.; Moross Castle & Greers I. 1993 (*BioMar*).

***Dumontia contorta* (S. G. Gmelin) Ruprecht**

synonym *Dumontia incrassata* (O. F. Müller) J. V. Lamouroux

A common epilithic species generally distributed from the upper littoral to the upper sublittoral (Irvine, 1983).

N. Atlantic: Europe from Portugal to the Faroës, Iceland and Greenland. Along north-eastern coast of northern America from Canada to Connecticut (South and Tittley, 1986). Common in Britain.

Ireland: pools of the upper littoral, common and first recorded in Co. Donegal in 1886.

Donegal B. - Bundoran 1891 coll. Lea (BM); 1955 coll. Dickinson (BM); 1975 coll. & det. OM; Bunatrahan 2002 coll. & det. OM (BEL: F11974); Coolmore, Rossnowlagh 1955 coll. KMD det. WFF (BM); Murles Pt 1978 coll. MdeV (BEL: F1824) & 1994 coll. & det. MDG (UCG: 008905; *BioMar*); Muckross Hd 1996 coll. PD (TCD: A854)\ Dunglow B. - Wyon Pt 1996 coll. EMS (TCD: A1206)\ Inishfree B. - Magheragallon 1995 coll. & det. OM (BEL: F11194)\ Inishbofin B. - Meenclady B. 1996 McC (TCD: A914 & A861)\ Sheephaven B. - Port-na-Blagh 1996 coll. & det. OM (BEL: F11293); Downing's B. 1886 coll. JM (BEL: F3361)\ Mulroy B. 1952/55 (Parkes, 1958b); Mark's Pt (2) 1993 coll. CCM det. MDG (TCD: A44)\ E. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11363)\ L. Foyle - N. Moville; Drung to Whitecastle; Ravenscliffe Reef 1937/39 (Blackler, 1951).

Furcellariaceae

***Furcellaria lumbricalis* (Hudson) J. V. Lamouroux**

synonym *Furcellaria fastigiata* (Turner) J. V. Lamouroux

A northern species similar to *Polyides rotundus* but easily distinguished. In rock pools of the lower littoral and the sublittoral, epilithic.

N. Atlantic: Europe from Spain to the Faroës and Iceland (South and Tittley, 1986). Generally distributed and common in Britain.

Ireland: there are no records from this county in Norton (1985) but it is common in littoral rock pools and usually abundantly encrusted with *Melobesia* and Bryozoa. First recorded in Co. Donegal in 1937/39.

Donegal B. - Bundoran (drift) 1891 coll. Lea (BM); Bunatrahan 2002 coll. & det. OM; Fintragh B. 1999 coll. & det. OM (BEL: F11835)\ Gweebarra B. - Rossbeg 2000 coll. & det. OM; Inishkeel 2000 coll. & det. OM\ Dunglow B. - NE Terman 1996 coll. McC det. MDG (TCD: A909)\ Inishfree B. - Maghergallon 1995 coll. & det. OM (BEL: F11207)\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11264)\ Mulroy B. - Sladdannavooghog 1952/55 (Parkes, 1958a); Mulroy B. 1979 coll. Minchin det. OM (BEL: F2375); Back Lough Narrows & E. of Gortnatraw B. 1993 (*BioMar*); Gola More 1997 coll. & det. OM (BEL: F11377)\ L. Swilly - Portnagarribane 1993 coll. CCM det. MDG (TCD: A45)\ Inishowen - Esky B. 1998 coll. & det. OM (BEL: F11652)\ L. Foyle - Greencastle; Drung to Redcastle; Clare to Saltpans Rocks 1937/39 (Blackler, 1951).

***Halarachnion ligulatum* (Woodward) Kützing**

synonym *Cruoria rosea* (P. L. et H. M. Crouan) P. L. et H. M. Crouan

The gametangial phase is a flattened erect short-lived frond growing up to 50cm long while the tetrasporic phase is a thin pale crust indistinguishable from *Cruoria rosea*. According to Maggs and Guiry (1989) this "crust should be regarded as a probable taxonomic synonym of *Halarachnion ligulatum*". The gametangial phase is mainly sublittoral to 17m depth and locally abundant (Norton, 1985). Because of the difficulty in identifying crustose phases comments on the habitats are not possible (Dixon and Irvine, 1977).

N. Atlantic: generally distributed on the European coast from Spain to the Shetlands (South and Tittley, 1986); locally abundant on the shores of both Britain and Ireland (Norton, 1985).

Ireland: recorded from several counties of Ireland (Guiry, 1978) but, being a sublittoral alga, may be under-recorded. Rare in Co. Donegal, first recorded in 1856, possibly more common in the sublittoral.

Donegal B. - Carrigan Hd 1996 coll. CSE det. MDG (TCD: A1000)\ Dunglow - Toninishgun Pt 1997 coll. & det. EMS (TCD: A1166 & A1046)\ L. Swilly - S. side of Anny Pt 1993 (*BioMar*)\ L. Foyle - Moville 1853 (drift) coll. WS (BEL: F1517; F1518; F6544 & 1937/39 (Blackler, 1951); Greencastle (drift) 1856 coll. WS (BEL: F6542; McMillan and Morton, 1979).

Gigartinaceae

***Chondrus crispus* Stackhouse**

vernacular names Irish Moss, Carragheen

Epilithic and very common on all shores from the midlittoral into the sublittoral (Dixon and Irvine, 1977). Harvested, with *Mastocarpus stellatus*, on the coasts of Ireland.

N. Atlantic: both sides of the Atlantic, in Europe from the Azores to the Faroës and Iceland and from Newfoundland to Delaware on the east coast of North America (South and Tittley, 1986). Very common in the British Isles. The fact that only two records of it in Co. Donegal are shown in Norton (1985) reveals how poorly the county had been then surveyed.

Ireland: very common in rock pools from the midlittoral to 24m sublittoral (Dixon and Irvine, 1977). First recorded in Co. Donegal in 1894.

Donegal B. - Bundoran 1975 coll. & det. OM; Bunatrahan 2002 coll. & det. OM (BEL: F11963); Murles 1978 coll. MdeV det. OM (BEL: F1821; F1822) & Murles Pt 1994 coll. & det. MDG (UCG: 008889 & 008890); Doorin Pt 2002 coll. OM (BEL: F11956); Fintragh B. 1999 coll. & det. OM; the Peninsula between Inver B. & McSwyne's B. 1894 (Duerden, 1895); Rolagh 1980 coll. EM det. MDG (UCG: 003502)\ Gweebarra B. - Inishkeel 2000 coll. & det. OM\ Inishfree B. - Brinlack 1996 coll. McC det. MDG (TCD: A904; A908; A877; A878 & A879)\ Inishbofin B. - Meenclady B. 1996 coll. McC det. MDG (TCD: A915 & A837)\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11251)\ Mulroy B. - Outer Claddaghanillian B.; Gortnatraw B.; Ballyhoorisky Pt 1993 (*BioMar*); Sladdannavooghog 1952/55 (Parkes, 1958a)\ Fanad - E. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11355; F11359)\ L. Swilly - Portnagarribane; Great Pollet Arch & S. side of Anny Pt 1993 (*BioMar*)\

Inishtrahull 2000 coll. JN det. OM\ Inishowen - Malin Hd (Brennan, 1950); Dunagree Pt 1998 coll. & det. OM\ L. Foyle - Greencastle to Culmore 1937/39 (Blackler, 1951).

Gloiosiphoniaceae

***Gloiosiphonia capillaris* (Hudson) Carmichael**

Epilithic in the lower littoral and sublittoral to 5m (Irvine, 1983). The erect gametangial phase produces carpospores which grow to form the tetrasporic crusts (Maggs, 1988). Found sporadically throughout the British Isles.

N. Atlantic: Portugal to the Shetlands and Iceland and in North America from Newfoundland to Connecticut (South and Tittley, 1986).

Ireland: Guiry (1978) shows records from seven counties and there are a few records from Northern Ireland (Morton, 1994). Only one record from Co. Donegal, very rare.

L. Swilly - Ballymastocker B. 1853 coll. WS (BEL: F6674; Sawers, 1854).

Kallymeniaceae

***Callocolax neglectus* F. Schmitz ex Batters**

A small species, reputedly parasitic, growing on *Callophyllis laciniata* in the sublittoral (Irvine, 1983). Probably not uncommon where *C. laciniata* in found and probably under-recorded.

N. Atlantic: occurring occasionally on both sides of the Atlantic from Spain to the Faroës and Greenland and around the British Isles. Massachusetts to Maine in North America (South and Tittley, 1986).

Ireland: several counties in Ireland (Norton, 1985), only one record from Co. Donegal, however, but may be more common.

Donegal B. - Moville drift 1937/39 (Blackler, 1951).

***Callophyllis laciniata* (Hudson) Kützing**

Epilithic and epiphytic on *Laminaria* from the upper sublittoral to a depth of at least 30m.

N. Atlantic: European coasts from Portugal to the Shetlands (South and Tittley, 1986) and generally distributed around the British Isles (Irvine, 1983).

Ireland: abundant and generally distributed in the sublittoral. First recorded in Co. Donegal in about 1845.

Donegal B. - Bundoran (drift) 1897 coll. Lea (BM); Doorin Pt 1994 coll. EMS det. CAM

(TCD: A594); Bullockmore 1984 coll. CMH (BEL: F5054); St John's Pt 1982 coll. BEP det. CMH (BEL: F3876)\ Rathlin O'Birne 1980 coll. & det. CAM (UCG: 003152; 003149; 003150; Maggs and Guiry, 1982b)\ Gweebarra B. - Portnoo 1955 coll. KMD (BM)\ Tory I. - *circa* 1845 coll. GCH (Hyndman, 1853); Rinnamorreeny 1995 coll. EMS det. MDG (TCD: A358); End of Tormore 1995 coll. EMS det. MDG & EMS (TCD: A329 & A339); Marnid Pt 1995 coll. EMS det. MDG (TCD: A353)\ Sheephaven B. - Duncap I. 1995 coll. EMS det. MDG (TCD: A312) & det. EMS (TCD: A316); Downies 1886 coll. JM (BEL: F3467)\ Rosguill - Melmore Hd 1993 (*BioMar*); Outer Claddaghanillian B. 1993 coll. & det. EMS (TCD: A73)\ Mulroy B. - Ravedy I.; Knox's Hole; White Mares B.; Mullaghanhardy Pt; Moross Castle 1993 (*BioMar*)\ L. Swilly - Anny Pt 1993 (*BioMar*)\ Inishtrahull - N. of Portmore 1995 coll. & det. EMS (TCD: A285); Gull I. 1995 coll. & det. EMS (TCD: A282); Scarony 1995 coll. & det. EMS (TCD: A279)\ L. Foyle - Moville *circa* 1850s coll. WS (BEL: F6633) & Clare 1937/39 (Blackler, 1951).

***Kallymenia reniformis* (Turner) J. Agardh**

Epilithic and epiphytic in the sublittoral to 27m (Irvine, 1983).

N. Atlantic: Azores to the British Isles and Massachusetts in North America (South and Tittley, 1986).

Ireland: many coastal counties of Ireland, all Co. Donegal records are recent, except for one from Greencastle in 1856.

Donegal B. - Bullockmore 1984 coll. & det. CMH (BEL: F5053); St John's Pt 1982 coll. BEP & det. CMH (BEL: F3877); 1983 coll. BEP det. CMH (BEL: F4657; F4658); 1983 coll. & det. CMH (BEL: F4960); Portnagh Rock 1996 coll. & det. EMS (TCD: A1148); Studdagh Rock 1996 coll. & det. CSE (TCD: A1154)\ Rathlin O'Birne 1980 coll. & det. CAM (UCG: 005524: 005530; 005540; 005523; Maggs and Guiry, 1982b); 1996 coll. & det. EMS (TCD: A1013)\ Tory I. - Scoltmorris 1995 coll. & det. EMS (TCD: A323); Rinnamorreeny 1995 coll. & det. CSE (TCD: A366); Tormore 1995 coll. EMS det. MDG (TCD: A335); Marnid Pt 1995 coll. & det. CSE (TCD: A357)\ Sheephaven B. - Horn Hd 1995 coll. & det. EMS (TCD: A306)\ Outer Claddaghanillian B. 1993 (*BioMar*)\ Limeburners Rock 1993 (*BioMar*)\ Rosguill - Melmore Hd 1993 (*BioMar*)\ Mulroy B. - Ravedy I. 1993; Knox's Hole 1993; Mullaghanhardy Pt 1993; Moross Castle 1993 (*BioMar*)\ Inishtrahull - Scarony 1995 coll. EMS

& det. MDG (TCD: A275); Gull I. 1995 coll. & det. EMS (TCD: A281); Portmore 1995 coll. & det. EMS (TCD: A288)\ Inishowen - Malin Hd (near) *circa* 1945 (Brennan, 1945; Blackler and McMillan, 1953)\ L. Foyle - Greencastle 1856 coll. & det. WS (BEL: F6678).

***Meredithia microphylla* (J. Agardh) J. Agargh**

synonym *Kallymenia microphylla* J. Agardh

A small alga compared to others in the Gigartinales. Until recently rarely recorded in Co. Donegal, sublittoral.

N. Atlantic: Europe from the Azores to the Shetlands (South and Tittley, 1986; Price and Tittley, 1978).

Ireland: common in the sublittoral in Northern Ireland (Morton, 1994).

Donegal B. - St John's Pt 1982 coll. BEP det. CMH (BEL: F3865); Studdagh Rock 1996 coll. CSE det. CAM (TCD: A1157)\ Rathlin O'Birne - The Stack 1980 coll. BEP det. CAM (UCG: 006133); Rathlin O'Birne 1996 coll. & det. EMS (TCD: A1018)\ Outer Claddaghanillian B. 1993 coll. & det. EMS & others (TCD: A74; A67)\ Mulroy B. - Knox's Hole 1993 (*BioMar*)\ Inishowen - Middle I. 1995 coll. & det. EMS (TCD: A297).

Peyssonneliaceae

***Peyssonnelia dubyi* P. L. et H. M. Crouan**

A thin prostrate dark red thallus closely attached to rock.

N. Atlantic: generally distributed on the Atlantic coasts of Europe from Norway to Portugal and in the Mediterranean.

Ireland: five counties in Ireland from Cork to Antrim (Guiry, 1978; Morton, 1994).

Donegal B. - Doorin Pt 2002 coll. OM (BEL: F11959).

Phyllophoraceae

***Coccotylus truncatus* (Pallas) M. J. Wynne et J. N. Heine**

synonym *Phyllophora truncata* (Pallas) A. D. Zinova

Until recently, this was referred to as *Phyllophora truncata* and the carposporangial growths described as the parasite *Actinococcus subcutaneus* (Lyngb. ex Hornem.) Rosenv. A northern species generally sublittoral and possibly overlooked. Scarce but not uncommon in the sublittoral (Dixon and Irvine, 1977).

N. Atlantic: widely distributed on both sides of the Atlantic from the British Isles at its southern

limit to the Shetlands, Spitzbergen, Iceland and Greenland, in North America from Canada to New Jersey (South and Tittley, 1986).

Ireland: five counties from Kerry to Antrim (Guiry, 1978). Rare, but may be more common in the sublittoral, as in Northern Ireland (Morton, 1994).

Tory I. – Rinnamorreeny 1995 coll. EMS det. MDG (TCD: 345)\ Inishowen – Dunagree Pt 1998 coll. & det. OM (BEL: F11673).

***Gymnogongrus griffithsiae* (Turner) Martius**

A species of southern distribution. Epilithic in the low-littoral and upper sublittoral. *Actinococcus aggregatus* was once thought to be a parasite but is now known to be the tetrasporic phase (Newton, 1931).

N. Atlantic: Europe from the Azores to the British Isles and from Massachusetts to Virginia in North America (South and Tittley, 1986).

Ireland: not recorded further north than Mayo in Dixon and Irvine (1977). However, there is one record from Co. Donegal and one from Northern Ireland (Morton, 1994), both old records. Very rare.

L. Swilly coll. WS (undated as *Gigartina griffithsia*) (BEL: F6540).

***Mastocarpus stellatus* (Stackhouse) Guiry**

synonym *Gigartina stellata* (Stackhouse) Batters

synonym *Petrocelis cruenta* J. Agardh

The two species *Mastocarpus stellatus* and *Chondrus crispus* are generally not distinguished by collectors of Carragheen. Epilithic and generally abundant in pools of the lower littoral and upper sublittoral. The encrusting "*Petrocelis cruenta*" is now known to be the tetrasporic phase.

N. Atlantic: both sides of the Atlantic, in Europe from Portugal to Iceland and in North America from Canada to Connecticut (South and Tittley, 1986).

Ireland: abundant and generally distributed. All the records relatively recent, none shown in Norton (1985). The earliest Co. Donegal record is probably 1845.

Donegal B. – Murles Pt 1994 coll. & det. MDG (UCG: 008884); 1995 (*BioMar*); Fintragh B. 1999 coll. & det. OM; Rolagh 1980 coll. EM det. MDG (UCG: 004999)\ Gweebarra B. – Rossbeg 2000 coll. & det. OM; Inishkeel 2000 coll. & det. OM\ Inishfree B. – Carnboy peninsula 1967 coll. & det. OM (BEL: F2785); Magheragallon 1995 coll. & det. OM\

Inishbofin B. - Meenclady B. 1996 coll. & det. McC (TCD: A900)\ Sheephaven B. - Port-na-Blagh 1996 coll. & det. OM (BEL: F11292); The Caskins 1996 coll. & det. OM (BEL: F11246; F11247)\ Mulroy B. - Mulroy B. 1952/55 (Parkes, 1958b); 1979 coll. Minchin (BEL: F2372); Gortnatraw B. 1993 (*BioMar*); Ballyhoorisky Pt & Is 1993 (*BioMar*); Gola More 1997 coll. & det. OM\ Fanad - W. Ballyhiernan B. 1997 coll. & det. OM\ L. Swilly - Portnagarribane & Great Pollet Arch 1993 (*BioMar*)\ Inishtrahull 2000 coll. JN det. OM\ Inishowen - Carrickabraghy 1996 coll. & det. McC (TCD: A898); Esky B.; Bulbinbeg & Dunagree Pt 1998 coll. & det. OM\ L. Foyle - Whitecastle to Greencastle 1937/39 (Blackler, 1951). The record in Sawers (1845) may be from L. Swilly or Foyle.

***Phyllophora crispa* (Hudson) P. S. Dixon**

Epilithic in shady pools in the low-littoral and sublittoral to 30m (Dixon and Irvine, 1977).

N. Atlantic: Europe from Poland as far north as Norway and Iceland. Not known from North America (South and Tittley, 1986), generally distributed around the British Isles.

Ireland: most records date from the 1960s. in places abundant but generally not uncommon. First recorded in Co. Donegal in 1850s.

Donegal B. - Bunatrahan 2002 coll. & det. OM (BEL: F11976); Murles Pt 1994 (*BioMar*); St John's Pt 1982 coll. CMH det. CAM (UCG: 006702; 006703) also coll. BEP conf. CAM (BEL: F3908); Portnagh Rock 1982 coll. & conf. CMH (BEL: F3913)\ Gweebarra B. - Portnoo 1955 coll. KMD (BM); 2000 coll. & det. OM (BEL: F11907)\ Dunglow B. - Toninishgun Pt 1996 coll. EMS det. CAM (TCD: A1227) & coll. CSE det. CAM (TCD: A1248); Arranmore 1944 coll. & det. Brennan (UCG: 006720)\ Bloody Foreland (Morton, 1967)\ Tory I. - Scoltmorris 1995 coll. & det. EMS (TCD: A322)\ Inishbofin B. - Meenclady 1996 coll. McC det. MDG (TCD: A862)\ Sheephaven B. - Horn Hd 1995 coll. & det. EMS (TCD: A309)\ Rosguill - Frenchman's Rock 1993 coll. CSE det. MDG (TCD: A65)\ Mulroy B. - Dundooan Rocks 1993 coll. CSE det. MDG (TCD: A59); Knock's Hole 1993 (*BioMar*)\ Fanad - E. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11365)\ L. Swilly coll. WS undated probably 1850s (BEL: F6563; Sawers, 1854)\ Inishowen - Bulbinbeg 1998 coll. & det. OM (BEL: F11640) & Dunagree Pt 1998 coll. & det. OM\ L. Foyle - Greencastle 1937/39 (Blackler, 1951).

***Phyllophora pseudoceranoïdes* (S. G. Gmelin) Newroth & A. R. A. Taylor**

synonym *Phyllophora membranifolia* Endlicher

Epilithic in pools of the low-littoral to 12m, sublittoral (Dixon and Irvine, 1977).

N. Atlantic: both sides of the Atlantic. Europe from Portugal to Shetlands, Iceland and Greenland. North America from Labrador to Delaware (South and Tittley, 1986).

Ireland: common in Northern Ireland (Morton, 1994) and generally distributed in the low-littoral rock pools and in the sublittoral. First recorded in Co. Donegal in 1854.

Donegal B. - Murles Pt 1994 coll. & det. MDG (UCG: 008897; *BioMar*)\ Inishfree B. - Carnboy 1967 coll. OM conf. Newroth (BEL: F2821)\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11270); Downies 1944 coll. & det. Brennan (UCG: 006645)\ L. Foyle - N. Moville 1937/39 (Blackler, 1951)\ L. Swilly coll. WS (BEL: F6568; Sawers, 1854).

***Phyllophora sicula* (Kützing) Guiry et L. M. Irvine**

Epilithic in the low-littoral and sublittoral to 15m (Dixon and Irvine, 1977).

N. Atlantic: European coasts from Portugal to the Faroës and Iceland, only on the south-west coasts of the British Isles (South and Tittley, 1986; Dixon and Irvine, 1977).

Ireland: only two Irish records shown in Norton (1985), and these are from the south coast. Very rare, one record from Co. Donegal. Not recorded from Northern Ireland in Morton (1994).

Inishfree B. - Brinlack Port 1996 coll. McC det. MDG (TCD: A896).

***Schottera nicaeënsis* (J. V. Lamouroux ex Duby) Guiry et Hollenberg**

Epilithic in the low and sublittoral to a depth of 15m.

N. Atlantic: Europe from Portugal to Scotland (South and Tittley, 1986). Not recorded from America. Generally on the south-western shores of the British Isles.

Ireland: rare, but possibly common in the sublittoral, almost all the records in Morton (1994) are sublittoral. First recorded in Co. Donegal in 1972.

Donegal B. - Murles Pt 1994; Doorin Pt 1995 (*BioMar*); St John's Pt 1972 coll. & det. BEP (UCG: 007599) & 1982 det. CMH (BEL: F3926); Portnagh Rock 1996 coll. & det. EMS (TCD: A997); Muckross Hd 1997 coll. & det. EMS (TCD: A1036); Carrigan Hd 1996 coll. & det. MDG (TCD: A1007)\ Rathlin O'Birne 1980 coll. & det. CAM (UCG: 007604 & 007605;

Maggs and Guiry, 1982b); 1996 coll. EMS det. MDG (TCD: A1024; A1017)\ Tory I. - Tormore 1995 coll. EMS det. MDG (TCD: A332); Rinnamorreeny 1995 coll. EMS det. MDG (TCD: A360)\ Limeburners Rock 1993 (*BioMar*).

Polyidaceae

***Polyides rotundus* (Hudson) Greville**

Similar to *Furcellaria lumbricalis* but readily distinguishable. Epilithic in littoral rock pools and in the sublittoral to about 12m (Dixon and Irvine, 1977).

N. Atlantic: common in Europe from Spain to Faroës and North America from Labrador to Connecticut (South and Tittley, 1986).

Ireland: common all around Ireland. First recorded in Co. Donegal 1937/39.

Donegal B. - Doorin Pt 2002\ Gweebarra B. - Rossbeg 2000 coll. & det. OM; Inishkeel 2000 coll. & det. OM\ Mulroy B. - Mark's Pt (2) 1993 (*BioMar*); off Doaghmore Strand 1993 coll. & det. BEP (TCD: A55)\ L. Swilly - S. side of Anny Pt 1993 (*BioMar*)\ Fanad - W. Ballyhiernian B. 1997 coll. & det. OM (BEL: F11336)\ L. Swilly - Portnagarribane 1993 coll. & det. CSE (TCD: A48); N. Ballymastocker B. 1997 coll. & det. OM (BEL: F11389)\ Inishowen - Esky B. 1998 coll. & det. OM (BEL: F11655); Dunagree Pt 1998 coll. & det. OM (BEL: F11671)\ L. Foyle - Moville 1854 coll. WS (BEL: F6598) & Ravenscliffe 1937/39 (Blackler, 1951).

Schizymeniaceae

***Schizymenia dubyi* (Chauvin ex Duby) J. Agardh**

synonym *Kallymenia dubyi* Harvey

synonym *Haematocelis rubens* J. Agardh

The tetrasporic phase of this species is now considered to be the crust previously known as *Haematocelis rubens* J. Ag. (Maggs and Guiry, 1982c). In pools of the mid-littoral to shallow sublittoral.

N. Atlantic: Europe from the Azores to Iceland including Ireland, England and Wales (South and Tittley, 1986).

Ireland: very rare with no recently confirmed records of attached plants.

Donegal (drift) (Watling *et al.*, 1970). The record coll. WS *circa* 1845 (Morris, 1854) may be from L. Swilly or Foyle.

Sphaerococcaceae

***Sphaerococcus coronopifolius* Stackhouse**

synonym *Haematocelis fissurata* P. L. et H. M. Crouan

The tetrasporic phase is a crust previously known under the name of *Haematocelis fissurata* (Maggs and Guiry, 1982c). An epilithic south-western species of the sub-littoral.

N. Atlantic: Europe from the Azores to Scotland (South and Tittley, 1986).

Ireland: very rare, the Bundoran specimen collected in 1852 was probably drift.

Donegal B. - Bundoran 1852 coll. WS (McMillan and Morton, 1979; BEL: F1504)\ Mulroy B. - Ballyhoorisky 1944 coll. & det. MdeV (UCG: 007761)\ Inishowen - Tullagh B. 1943 coll. & det. Brennan (UCG: 007762)\ Inishtrahull - N. of Portmore 1995 coll. & det. BEP (TCD: A295).

Plocamiales

Plocamiaceae

***Plocamium cartilagineum* (Linnaeus) P. S. Dixon**

synonym *Plocamium coccineum* Lyngbye

As this species is attractive and readily identified by its secund branching, it is well recorded and is to be found in many old collections - but not always well documented. Low littoral rock pools and deep into the sublittoral.

N. Atlantic: most European coasts from the Azores to Iceland, save the Baltic (South and Tittley, 1986), not recorded from North America or Greenland. Common around Britain and Ireland.

Ireland: generally common around Ireland on all shores in the littoral and sublittoral.

Donegal B. - Bundoran 1891 coll. Lea (BM); Bunatrahan 2002 coll. & det. OM; Murles Pt 1994 coll. & det. MDG (UCG: 008914)\ Rathlin O'Birne 1996 coll. & det. EMS (TCD: A1031)\ Gweebarra B. - Portnoo 2000 coll. & det. OM; Inishkeel 2000 coll. & det. OM\ Dunglow B. - NE Terman 1996 coll. McC (TCD: A860)\ Inishfree B. - Magheragallon 1995 coll. & det. OM\ Tory I. - *circa* 1845 coll. GCH (Hyndman, 1853); End of Tormore coll. & det. EMS (TCD: A342); Scoltmorris 1995 coll. & det. EMS (TCD: A325)\ Sheephaven B. - Horn Hd 1995 coll. & det. EMS (TCD: A308); Downies 1886/87 coll. JM (BEL: F3377;

F3356); Outer Claddaghanillian B. 1993 (*BioMar*)\ Limeburners Rock 1993 (*BioMar*)\ Rosguill - Melmore Hd (*BioMar*)\ Mulroy B. - Ravedy I.; Knox's Hole; Pan B.; White Mares B., Broadwater; Mullaghanhardy Pt; Moross Castle; Millstone B.; Tirloughan B.; Dundooan Rocks; & off Doaghmore Strand 1993 (*BioMar*)\ Fanad - W. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11344); Ballyhoorisky Pt 1993 (*BioMar*)\ L. Swilly - 1852 coll. WS (BEL: F3327); N. Ballymastocker B. 1997 coll. & det. OM; Anny Pt 1993 (*BioMar*)\ Inishowen - Middle I. 1995 coll. & det. EMS (TCD: A300). Inishtrahull - N. of Portmore 1995 coll. & det. EMS (TCD: A290)\ Inishowen - Dunagree Pt 1998 coll. & det. OM\ L. Foyle - Moville 1854 coll. WS 1854 (McMillan and Morton, 1979; F1501 also F6580 undated). The record in Sawers (1854) may be from L. Swilly or Foyle.

Rhodymeniales

Champiaceae

***Chylocladia verticillata* (Lightfoot) Bliding**

An epilithic species of the low-littoral and sublittoral. Widely distributed.

N. Atlantic: Europe from Portugal to Norway (South and Tittley, 1986) including the British Isles.

Ireland: widely distributed especially on more western shores. Common.

Donegal B. - Bundoran 1975 coll. & det. OM tetrasporic & cystocarpic (BEL: F103; F104); Murles 1978 coll. MdeV (BEL: F1823) & Murles Pt 1994 coll. & det. MDG (UCG: 008907 & *BioMar*)\ Gweebarra B. - Portnoo 1955 KMD (BM)\ Dunglow B. - NE Terman 1996 coll. McC det. MDG (TCD: A936)\ Mulroy B. - Broadwater 1953 coll. & det. HMP (UCG: 003606 & Parkes, 1958b)\ Fanad - W. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11333)\ L. Swilly - 1852 det. MDG "sterile but probably *C. verticillata*" (Guiry *et al.*, 1979; BEL: F7058) & Rathmullan 1852 coll. WS (BEL: F3342); Blackrock, Rathmullan 1853 coll. WS det. MDG "sterile but probably *C. verticillata*" (Guiry *et al.*, 1979; BEL: F7059) & 1855 coll. WS det. MDG with "tetrahedrally devided tetrasporangia and probably *Chylocladia verticillata*" (Guiry *et al.*, 1979; BEL: F7060)\ L. Foyle - Moville B. 1854 coll. WS (BEL: F7056) & 1855 coll. WS conf. ADC (BEL: F7057); 1983 coll. CMH (BEL: F4344); channel off Greencastle; Whitecastle; Drung & Moville 1937/39 (Blackler, 1951).

***Gastroclonium ovatum* (Hudson) Papenfuss**

An epilithic or epiphytic species of the low or sublittoral; quite common especially on south-western shores (Norton, 1985). Easily identified and well recorded.

N. Atlantic: Atlantic shores of Europe from the Azores, Spain, France and the British Isles including the Shetlands. Not recorded from Norway, Iceland or North America (South and Tittley, 1986).

Ireland: widespread and not uncommon, there are no records of it from Co. Donegal in Norton (1985), it is generally recorded all around Ireland.

Donegal B. - Bundoran 1840 GCH (BEL: F2669); Murles Pt 1994 (*BioMar*)\ Gweebarra B. - Portnoo 1955 coll. KMD (BM)\ Mulroy B. - Sladdannavooghog 1952/55 (Parkes, 1958a)\ Fanad - W. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11335)\ L. Swilly - Portnagarribane 1993 coll. & det. CCM (TCD: A47)\ Inishowen - Carrickabraghy 1996 coll. & det. McC (TCD: A934; A871 & A872); Malin Hd 1852 (BM); Esky B. & Bulbinbeg 1998 coll. & det. OM (BEL: F11643)\ L. Foyle - Greencastle 1937/39 (Blackler, 1951); Moville 1854 coll. WS (BEL: F7065).

***Gastroclonium reflexum* (Chauvin) Kützing**

synonym *Chylocladia reflexa* (Chauvin) Zanardini

Epiphytic and epilithic in the littoral and upper sublittoral. The species may be confused with *Chylocladia verticillata* and pass unrecorded.

N. Atlantic: Portugal to the British Isles, but no further north and not in America (South and Tittley, 1986).

Ireland: very rare.

L. Foyle - specimens collected by Sawers (1854) identified under this name (*G. reflexum*) from L. Swilly (BEL: F7058; F7059; F7060) were redetermined in 1978 as *Chylocladia verticillata* q.v. (Guiry *et al.*, 1979); Moville 1937/39 (Blackler, 1951: as *Chylocladia reflexa*).

Lomentariaceae

***Lomentaria articulata* (Hudson) Lyngbye**

An easily identified species and well recorded. Epilithic and epiphytic in the littoral and sublittoral to a depth of 18m (Irvine, 1983).

N. Atlantic: Europe from the Azores to the Shetlands and Norway, common around the British

Isles (South and Tittley, 1986).

Ireland: there are only two records from Co. Donegal in the *Provisional Atlas* (Norton, 1985). Common in Northern Ireland in shaded rock pools (Morton, 1994).

Donegal B. - Murles Pt 1994 coll. & det. MDG (UCG: 008908 & *BioMar*); Doorin Pt 2002 coll. OM; Bunatrahan 2002 coll. & det. OM; near St John's Pt 1999 coll. & det. OM; Muckross Hd 1982 coll. BEP (BEL: F3892); Rolagh 1980 coll. EM det. MDG (UCG: 005789)\ Gweebarra B. - Portnoo 2000 coll. & det. OM; Inishkeel 2000 coll. & det. OM\ Sheephaven B. - Port-na-Blagh 1996 coll. & det. OM; The Caskins 1996 coll. & det. OM (BEL: F11269)\ Mulroy B. - 1952/55 (Parkes, 1958b); Mark's Pt; Ballyhoorisky Pt & W. of Ballyhoorisky I. 1993 (*BioMar*); Gola More 1997 coll. & det. OM\ L. Swilly - Portnagarribane 1993 (*BioMar*); N. Ballymastocker B. 1997 coll. & det. OM\ Inishtrahull 2000 coll. JN det. OM\ Inishowen - Malin mill/well (?) coll. & det. JM (BEL: F3442); Tullagh B. 1943 coll. & det. MdeV (UCG: 005700); Carrickbraghy 1996 coll. & det. McC (TCD: A933); Dunagree Pt 1998 coll. OM\ L. Foyle - Greencastle 1856 coll. WS (BEL: F7075; F3345); Redcastle to Greencastle 1937/39 (Blackler, 1951). The record in Sawers (1854) may be from L. Swilly or Foyle.

***Lomentaria clavellosa* (Turner) Gaillon**

Epilithic or epiphytic, a common species of the low littoral and sublittoral. Generally distributed in the British Isles.

N. Atlantic: European coasts Portugal to Shetlands, Norway and Iceland and in North America from Maine to Connecticut (South and Tittley, 1986).

Ireland: widespread around Ireland. First recorded in Co. Donegal in L. Swilly in 1852 by Sawers.

Donegal B. - Murles 1978 coll. MdeV (BEL: F1831); Muckross Hd 1996 coll. PD (TCD: A845); Gloster Rock 1996 coll. BEP det. MDG (TCD: A1016)\ The Sound 1996 coll. CSE det. MDG (TCD: A1045)\ S. side of Limeburners Rock 1993 coll. & det. BEP (TCD: A61)\ Mulroy B. 1952/55 (Parkes, 1958b)\ L. Swilly - 1852 coll. WS (BEL: F7080); Black Rock near Rathmullan 1968 coll. & det. OM (BEL: F3016)\ Inishowen - Carrickbraghy 1996 coll. & det. McC (TCD: A932)\ Scarony SW 1995 coll. & det. CCM (TCD: A275)\ L. Foyle - Redcastle (dredged) & Clare 1937/39 (Blackler, 1951)\ Moville 1854 coll. WS (BEL: F7081).

***Lomentaria orcadensis* (Harvey) F. S. Collins ex W. R. Taylor**

Epilithic and epiphytic probably relatively common in the sublittoral.

N. Atlantic: North America and Europe from Portugal to Norway and Iceland (South and Tittley, 1986). Widely distributed in the British Isles (Irvine, 1983).

Ireland: widespread but sublittoral and probably under-recorded.

Rathlin O'Birne area - Rathlin O'Birne I. 1980 coll. & det. CAM (UCG: 005707; Maggs and Guiry, 1982b); Black Rock outside Rathlin O'Birne 1983 coll. CMH (BEL: F4654)\ Inishtrahull - Scarony SW 1995 coll. & det. EMS (TCD: A277).

Rhodymeniaceae

***Rhodymenia ardissonei* Feldmann**

Although Irvine (1983: p. 93) noted that reports of this species from the British Isles were based on misidentifications and it is not mentioned in South and Tittley (1986), *R. ardissonei* is included in Hardy and Guiry (2003) and there are recent records of it.

N. Atlantic and Ireland: *R. ardissonei* is not included in most checklists or references, its North Atlantic distribution is unknown.

Donegal B. - Studdagh Rock 1996 coll. & det. EMS (TCD: A1152); Muckross Hd 1997 coll. EMS & det. MDG (TCD: A1038); Gloster Rock 1996 coll. & det. BEP (TCD: A1025); Carrigan Hd 1996 coll. EMS det. MDG (TCD: A1012)\ Mulroy B. - W. of Knox's 1993 (*BioMar*).

***Rhodymenia holmesii* Ardissone**

synonym *Rhodymenia pseudopalmata* (Lamouroux) Silva var. *ellisiae* (Duby) Guiry et Hollenberg

Generally sublittoral, a southerly species with its northern limit at the Skerries (Erwin *et al.*, 1990). Poorly recorded and rare.

N. Atlantic: Spain north to Ireland and Britain (South and Tittley, 1986).

Ireland: all the Irish records are recent, the first record from Co. Donegal being from Rathlin O'Birne in 1980.

Donegal B. - Portnagh Rock, St John's Pt 1982 coll. CMH (BEL: F3848 & F3853)\ Rathlin O'Birne 1980 coll. & det. CAM (UCG: 007487; Maggs and Guiry, 1982b)\ Dunglow B. - Toninishgun Pt 1996 coll. EMS det. CAM (TCD: A1228; A1232); Rutland Channel 1996 coll.

& det. PT (TCD: A1235)\ Mulroy B. - Knox's Hole; Dundooan Rocks 1993 coll. & det. CCM (TCD: A64).

***Rhodymenia pseudopalmata* (J. V. Lamouroux) P. C. Silva**

This species could be confused with other species, however all the specimens below have been determined with confidence.

N. Atlantic: Azores to France, England and Ireland, but not found further north or in America (South and Tittley, 1986).

Ireland: a southern species as can be clearly seen in Norton (1985). All the records are recent.

Donegal - St John's Pt 1982 coll. & det. CMH (UCG: 007461)\ Rathlin O'Birne - Black Rock 1983 coll. CMH det. CAM (BEL: F4942) & 1996 coll. EMS det. MDG (TCD: A1026)\ Dunglow B. - NE Terman 1996 coll. McC det. MDG (TCD: A864)\ Tory I. - Tormore 1995 coll. EMS det. CAM (TCD: A632)\ Outer Claddaghanillian B. 1993 coll. & det. BEP & others (TCD: A71; A68)\ L. Swilly - Anny Pt 1993 (*BioMar*)\ Inishtrahull - Gull I. 1995 coll. & det. BEP (TCD: A284).

Ceramiales

Ceramiaceae

Aglaothamnion

Aglaothamnion was first created as a separate genus in 1941 for the uninucleate species in *Callithamnion*. However, this was not accepted by all, e.g. Parke and Dixon (1976) and South and Tittley (1986). Maggs and Hommersand (1993), however, separated the two genera and detailed the differences - the primary one being the uninucleate cells of *Aglaothamnion*. As the specimens are small and not easily determined, all may be under-recorded or the identifications doubtful unless recently confirmed.

***Aglaothamnion diaphanum* L'Hardy-Halos et Maggs**

Described as a new species in 1991 (L'Hardy-Halos and Maggs, 1991). Epiphytic in the sublittoral, but very rare in the British Isles, known only from Cornwall, Kerry and Donegal (Maggs and Hommersand, 1993).

N. Atlantic: England and Ireland as far as is known.

Ireland: only known fron Cos Donegal and Kerry.

Donegal B. – St John's Pt 1993, the type is from St John's Pt (Maggs and Hommersand, 1993).

***Aglaothamnion gallicum* (Nägeli) Halos ex Andé**

synonym *Aglaothamnion brodiaea* sensu Feldmann-Mazoyer

This species was formerly considered to be conspecific with *A. hookeri* and there are few records of its distribution.

N. Atlantic: France, the British Isles, Denmark and Sweden (Maggs and Hommersand, 1993).

Ireland: only one undetailed record from Co. Donegal (Maggs and Hommersand, 1993).

***Aglaothamnion hookeri* (Dillwyn) Maggs et Hommersand**

synonym *Aglaothamnion brodiaei* (Harvey) Feldmann-Mazoyer

Specimens named *Callithamnion polyspermum* C. Ag. were are included in *Callithamnion hookeri* by Dixon and Price (1981) as "there are no consistent morphological distinctions...", however further studies are needed. Records from the west Atlantic may be of another species (Maggs and Hommersand, 1993). In pools of the midlittoral to the low-littoral.

N. Atlantic: European Atlantic shores from the Azores to Iceland (South and Tittley, 1986).

Ireland: common in Cos Antrim and Down (Morton, 1994) and probably under-recorded in Donegal. First recorded by R. Brown prior to 1853.

Inishfree B. – Magheragallon 1995 coll. & det. OM (BEL: F11201)\ Mulroy B. 1952/55 (Parkes, 1958b)\ Dunree coll. R. Brown (Harvey, 1871: as *Callithamnion polyspermum*), it is probable that this is the record repeated in other publications (Gifford, 1853 and undetailed from "Donegal" in Batters, 1902; Dixon and Price, 1981)\ Inishowen – Carrickabraghy 1996 coll. McC det. CAM (TCD: A1267)\ L. Swilly: as "*Callith. Hookeri*?" coll. WS (BEL: F7123).

***Aglaothamnion roseum* (Roth) Maggs et L'Hardy-Halos**

synonym *Callithamnion roseum* (Roth) Lyngbye

Epilithic and epizoic from the low-littoral into the upper sublittoral. A south-western species (Maggs and Hommersand, 1993).

N. Atlantic: Europe from Portugal to Norway, records from the American shores require further examination (South and Tittley, 1986). Common on south-west shores of Britain and Ireland (Maggs and Hommersand, 1993).

Ireland: four counties in Ireland (Dixon and Price, 1981), probably widespread. There is only one record in Donegal and it requires confirmation, it may be more widespread. Recent records in Northern Ireland are from the *NILS* (Morton, 1994).

L. Foyle - Moville coll. WS probably 1850s (BEL: F7125).

***Aglaothamnion sepositum* (Gunnerus) Maggs et Hommersand**

synonym *Callithamnion sepositum* (Gunnerus) P. S. Dixon et J. H. Price

synonym *Callithamnion arbuscula* (Dillwyn) Lyngbye

Epilithic, often epizoic on mussels in the mid-littoral and widely distributed. One of the few northern species which approach the southern distribution limits on the shores of the British Isles.

N. Atlantic: widespread along the coasts of Europe from France, Faroës to Iceland (South and Tittley, 1993).

Ireland: several counties in Ireland (Dixon and Price, 1981). All recent records from Northern Ireland are from the *NILS* (Morton, 1994). Common in the British Isles.

Donegal B. - St John's Pt 1989 coll. & det. CAM (UCG: 009119)\ Inishfree B. - near Rinnalea Pt 1937/39 (Blackler, 1951)\ Mulroy B. - between Tranafaighaboy & Gortnalughoge 1952/55 (Parkes, 1958a: as *C. arbuscula*)\ L. Swilly coll. WS as "*Callith arbuscula*" (BEL: F7127)\ Inishowen - Carrickabraghy 1996 coll. McC det. CAM (TCD: A1311) & det. McC (TCD: A1256)\ L. Foyle - Greencastle; Saltpans Rock & N. Moville 1937/39 (Blackler, 1951: as *C. arbuscula*).

***Aglaothamnion tenuissimum* (Bonnemaison) Feldmann-Mazoyer**

synonym *Aglaothamnion byssoides* (Harvey) L'Hardy-Halos et Rueness

synonym *Callithamnion byssoides* Harvey

South and Tittley (1986) noted the distribution to be on both sides of the Atlantic but commented that there may be two taxa involved in this name - this is confirmed by Maggs and Hommersand (1993). It is widely distributed on the European coasts and on the shores of the British Isles (South and Tittley, 1986). Epiphytic and epizoic from mid-littoral pools to the sublittoral, generally on more sheltered shores (Maggs and Hommersand, 1993). The old records below are to be considered with caution.

N. Atlantic: widely distributed, Portugal to Scotland and in North America from Canada to

Virginia (South and Tittley, 1986).

Ireland: possibly fairly common but widely under-recorded.

Donegal B. - St John's Pt 1989 coll. & det. CAM (UCG: 009118)\ L. Swilly - Fort Stewart Ferry 1852 coll. WS (BEL: F3337); L. Swilly [undetailed] 1853 coll. WS (BEL: F10611); [undetailed] coll. Owens & Major Martin (Landsborough, 1857).

***Callithamnion* Lyngbye**

In most previous works *Aglaothamnion* was not distinguished as a separate genus from *Callithamnion*. However, Maggs and Hommersand (1993) considered the multinucleate vegetative cells of *Callithamnion* to be a significant feature and separated the two genera. Dixon and Price (1981) did not separate the two genera and commented that "The genus *Callithamnion* presents a supreme example of the taxonomic confusion in red algae". As the different species are not easily determined they are probably under-recorded and possibly confused.

***Callithamnion corymbosum* (J. E. Smith) Lyngbye**

Maggs and Hommersand (1993) consider four species of *Callithamnion* distinct from *Aglaothamnion* in the British Isles. Epiphytic and epilithic, low-littoral to the sublittoral and widespread around the British Isles.

N. Atlantic: Europe - Portugal to the Faroës and in America from Newfoundland to Virginia (South and Tittley, 1986). Widely distributed in the British Isles (Maggs and Hommersand, 1993).

Ireland: probably under-recorded due to difficulty of identification. The old records require confirmation. Only one confirmed record.

Gweebarra B. - Rossbeg 1955 coll. KMD (BM)\ Mulroy B. - subtidal 1988 coll. & det. CAM (BEL: F5931)\ L. Foyle - Greencastle 1856 coll. WS (BEL: F7119); L. Foyle 1854 coll. WS (McMillan and Morton, 1979; BEL: F1537; F7118; F3333; F3343).

***Callithamnion tetragonum* (Withering) S. F. Gray**

Generally epiphytic in pools in the lower littoral and sublittoral.

N. Atlantic: Azores to Iceland and in North America from Newfoundland to Virginia (South and Tittley, 1986). Generally distributed around the British Isles (Maggs and Hommersand, 1993).

Ireland: several counties in Ireland and fairly well recorded in Northern Ireland (Morton, 1994). Some records which are doubtful have not been included here, the older records require confirmation.

Co. Donegal [not detailed] (Maggs and Hommersand, 1993)\ Gweebarra B. - Portnoo 1955 coll. & det. KMD (BM)\ Dunglow B. - Toninishgun Pt 1996 coll. EMS det. CAM (TCD: A1230)\ Limeburners Rock 1993 coll. BEP det. MDG (TCD: A62)\ Moville 1854 coll. WS (BEL: F7133)\ Pollan B. 1943 coll. & det. MdeV (UCG: 003101).

***Seirospora interrupta* (J. E. Smith) F. Schmitz**

synonym *Seirospora seirosperma* (Harvey) P. S. Dixon

Epilithic and epiphytic mainly in the sublittoral to 20m depths. Maggs and Hommersand (1993) pointed out that the two species *S. seirosperma* and *S. interrupta* have now been merged, they are listed as two species in South and Tittley (1986). A small finely branched species.

N. Atlantic: Portugal to the Shetlands and in America from Canada, Massachusetts to New Jersey (South and Tittley, 1986). Widely distributed in the British Isles (Maggs and Hommersand, 1993).

Ireland: very rare in Northern Ireland (Morton, 1994) with only two records from Co. Donegal.

Mulroy B. - 1988 coll. CAM (BEL: F5928)\ L. Foyle - Moville 1855 coll. WS (BEL: F7401).

***Plumaria plumosa* (Hudson) Kuntze**

synonym *Plumaria elegans* (Bonnemaison) F. Schmitz

Probably well recorded as it is attractive and relatively easy to identify. Epilithic in shaded places of the lower shore. Recorded from both the American and European Atlantic coasts.

N. Atlantic: Portugal to Iceland and Newfoundland to New Jersey in North America (South and Tittley, 1986). Generally distributed around the British Isles (Maggs and Hommersand, 1993).

Ireland: common around Ireland and on the coasts of Co. Donegal. Only two records from Co. Donegal are shown in Norton (1985). Sawers' record from L. Swilly in the 1850s probably the earliest for the county.

Donegal B. - Rolagh 1980 coll. EM det. MDG (UCG: 006836)\ Gweebarra B. - Portnoo

2000 coll. OM; Dunmore Hd 1943 coll. & det. Brennan (UCG: 006838)\ Dunglow B. - NE Terman 1996 coll. McC (TCD: A856)\ Inishfree B. - Magheragallon 1995 coll. & det. OM (BEL: F11200); Brinlack Port 1996 coll. McC (TCD: A855 & A853)\ Inishbofin B. - Meenclady B. 1996 coll. McC det. MDG (TCD: A869)\ Mulroy B. - 1952/55 (Parkes, 1958b)\ L. Swilly probably 1850s coll. WS (BEL: F7294)\ Inishtrahull 2000 coll. JN det. OM\ Inishowen - Bulbinbeg 1998 coll. & det. OM (BEL: F11648)\ L. Foyle - Moville; Redcastle 1937/39 (Blackler, 1951).

***Ptilota gunneri* P. C. Silva, Maggs et L. M. Irvine**

synonym *Ptilota plumosa* (Hudson) C. Agardh

This species has been spreading south associated with changing climate (Farnham, 1980). Usually epiphytic from lower littoral into the sublittoral at 10m or more (Maggs and Hommersand, 1993). A northern species (Norton, 1985).

N. Atlantic: Europe from the British Isles to Spitzbergen and Iceland (South and Tittley, 1986).

Ireland: common and readily identified. First recorded sometime prior to 1845.

Donegal B. - Bundoran 1891 coll. Lea & 1894 coll. Johnson; Coolmore 1955 coll. KMD (BM; Cullinane and Murphy, 1976); St John's Pt 1989 coll. & det. CAM (UCG: 009120); Bullockmore 1982 coll. CMH (BEL: F5056)\ Tory I. - pre 1845 coll. GCH (Hyndman, 1853)\ Sheephaven B. - Downies 1886 coll. JM (BEL: F3360; F3460; F3461)\ Limburner Rock 1993 coll. & det. CSE (TCD: A57)\ Mulroy B. - drift 1953 (Parkes, 1958b)\ Port Kinnagoe 1915 coll. Duke (Cullinane and Murphy, 1976). The record in Sawers (1854) may be from L. Swilly or Foyle.

***Antithamnion cruciatum* (C. Agardh) Nägeli**

One of the small densely tufted algae which, like *Aglaothamnion* and *Callithamnion* and others, are not readily identified and are generally under-recorded. There are three species in Maggs and Hommersand (1993) one of which (*A. cruciatum*) is considered only a variety in South and Tittley (1986). Another species (*A. densum*) has recently been discovered (Maggs and Hommersand, 1993). Only *A. cruciatum* has so far been recorded from Co. Donegal. Epiphytic in mid-littoral to sublittoral on exposed shores.

N. Atlantic: Spain to the British Isles and Norway. In North America from Newfoundland to Virginia (South and Tittley, 1986).

Ireland: Cos Cork, Kerry, Clare, Galway and Donegal (Maggs and Hommersand, 1993). Only one confirmed record from Co. Donegal.

Mulroy B. 1988 coll. CAM (BEL: F5929) – first Irish record.

***Ceramium* Roth**

Maggs and Hommersand (1993) made a major reassessment of the genus. They noted that *C. rubrum* was an illegitimate name and that there were four species in the "*C. rubrum*" group: *C. pallidum*; *C. botryocarpum*; *C. nodulosum* and *C. secundatum*. They considered most records of *C. rubrum* from the British Isles to be based on one of these four species. Although not validly published, they employed these "provisional names" which are accepted in Hardy and Guiry (2003).

***Ceramium botryocarpum* A. W. Griffiths ex Harvey**

A name used by Maggs and Hommersand (1993) as one of the four provisional names in the *C. rubrum* complex. Epiphytic and epilithic in rock pools from the upper shore to the lower littoral.

N. Atlantic: France and various locations in Britain and Ireland (Maggs and Hommersand, 1993).

Ireland: Cos Cork, Clare and Dublin (Maggs and Hommersand, 1993). There are several records from Co. Donegal.

Donegal B. – St John's Pt 1999 coll. OM conf. CAM (BEL: F11816)\ Gweebarra B. – Inishkeel 2000 coll. & det. OM (BEL: F11928)\ Limeburners Rock 1993 coll. BEP det. CAM (TCD: A553)\ Inishowen – Esky B. 1998 coll. & det. OM (BEL: F11654)\ L. Foyle – S. pier (dredged); Carnagarve; Moville; Ravenscliffe Reef 1937/39 (Blackler, 1951).

***Ceramium ciliatum* (J. Ellis) Ducluzeau**

One of the "spiny" species clearly sorted out by Dixon (1960), epilithic and epizoic, widespread in the lower littoral rock pools and in the sublittoral.

N. Atlantic: European shores from the Azores to Britain and Ireland, but no records from North America (South and Tittley, 1986).

Ireland: generally widespread but not very common.

Gweebarra B. – Portnoo 2000 coll. & det. OM\ Inishbofin B. – Meenclady B. 1996 coll. McC det. CAM (TCD: A1320)\ Mulroy B. 1952/55 (Parkes, 1958b)\ Inishowen – Bulbinbeg

1998 coll. & det. OM (BEL: F11645). The record in Sawers (1854) may from L. Foyle or Swilly.

***Ceramium diaphanum* (Lightfoot) Roth**

synonym *Ceramium tenuissimum* (Roth) Areschoug, *nom illeg.*

An rather rare epiphytic species from extreme low-littoral and upper sublittoral.

N. Atlantic: European coasts from the Azores to the Faroës and in North America from Newfoundland to Virginia (South and Tittley, 1986).

Ireland: probably widely distributed in Ireland but rather rare.

Mulroy - Gortnatraw B. 1993 coll. CSE det. CAM (TCD: A562)\ L. Swilly coll. WS as *C. diaphanum*? (BEL: F7142); Rathmullan (Batters, 1902: as *C. tenuissimum*)\ L. Foyle - Greencastle 1856 coll. WS (BEL: F7143).

***Ceramium echinotum* J. Agardh**

One of the "spiny" species and relatively easily determined, epiphytic from rock pools in the mid-littoral also in the sublittoral (Maggs and Hommersand, 1993).

N. Atlantic: European coast from the Azores to Norway (South and Tittley, 1986).

Ireland: widely distributed in Ireland (Maggs and Hommersand, 1993) and not uncommon.

Donegal B. - Bundoran B. coll. probably Hyndman det. Rea (BEL: F7145; also F7150; F7148 conf. ADC)\ Mulroy B. - Back Lough Narrows 1993 coll. BEP det. CAM (TCD: A567)\ L. Swilly - Ballymastocker B. 1853 coll. WS (BEL: F3338)\ L. Swilly coll. *circa* 1853 (BEL: F7147).

***Ceramium gaditanum* (Clemente) Cremades**

synonym *Ceramium flabelligerum* J. Agardh

A spiny species and usually readily identifiable, however occasionally the spines are sparse and there may be doubt. Epilithic and epiphytic in the mid to lower littoral (Maggs and Hommersand, 1993).

N. Atlantic: Portugal to Norway and around the British Isles (South and Tittley, 1986).

Ireland: widely distributed in Ireland (Maggs and Hommersand, 1993) but probably not uncommon.

Donegal B. - Fintragh B. 1999 coll. & det. OM\ Sheephaven B. - Port-na-Blagh 1996 coll. & det. OM (BEL: F11287); The Caskins 1996 coll. & det. OM det. CAM (BEL: F11298)\

Inishowen - Carrickabraghy 1996 coll. McC det. CAM (TCD: A1294); Dunagree Pt 1998 coll. & det. OM (BEL: F11664)\ L. Swilly *circa* 1850 coll. WS (BEL: F7151)\ L. Foyle - Greencastle 1937/39 (Blackler, 1951: as *C. flabelligerum*). The record in Sawers (1854) may from L. Swilly or Foyle.

***Ceramium pallidum* (Nägeli ex Kützing) Maggs et Hommersand**

synonym *Ceramium armoricum* P. Dixon et H. Parkes

A name used by Maggs and Hommersand (1993) as one of the four provisional names in the *C. rubrum* complex. Noted as *C. amoricum* in Parke and Dixon (1968).

N. Atlantic: North American and European coasts of France and Britain (South and Tittley, 1986), however reassessment of the distribution is required (Maggs and Hommersand, 1993).

Ireland: widespread on all coasts (Maggs and Hommersand, 1993).

Donegal B. - St John's Pt 1999 coll. OM conf. CAM (BEL: F11815)\ Gweebarra B. - Portnoo 2000 coll. & det. OM\ Dunglow B. - NE Terman 1996 coll. McC det. CAM (TCD: A1291)\ Inishfree B. - Gweedore B. near Magheragallon 1995 coll. & det. OM (BEL: F11205)\ Sheephaven B. - The Caskins 1996 coll. OM det. CAM (BEL: F11245)\ Mulroy B. - Dundooan Rocks 1993 coll. BEP det. CAM (TCD: A557)\ L. Swilly - Portnagarribane 1993 coll. BEP det. CAM (TCD: A559)\ Inishtrahull 2000 coll. JN det. OM (BEL: F11936).

***Ceramium rubrum* agg.**

This illegitimate name appears to cover a complex of four species. The provisional names: *C. pallidum*, *C. botryocarpum*, *C. nodulosum* and *C. secundatum* are used in Maggs and Hommersand (1993). *C. nodulosum* is the valid name for the species usually known as *C. rubrum*. The name "*C. rubrum*" has been employed so often, in so many publications, including South and Tittley (1986), and attached to so many specimens, that it is used here for all records not redetermined.

N. Atlantic: Azores to the Faroës, Spitzbergen, Iceland and Greenland, from Canada to Virginia in North America (South and Tittley, 1986).

Ireland: common as *C. rubrum*.

Donegal B. - Kiln Port 1999 coll. OM; Fintragh B. 1999 coll. OM\ Gweebarra B. - Rossbeg 2000 coll. & det. OM; Inishkeel 2000 coll. & det. OM\ Mulroy B. in 1952/55 (Parkes, 1958b)\ Fanad - E. & W. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11361; F11339;

F11347)\ L. Swilly - Portnagarribane 1993 coll. BEP det. CAM (TCD: A560); N. Ballymastocker B. 1997 coll. & det. OM (BEL: F11367)\ L. Foyle - North Deep; Greencastle to Whitecastle 1937/39 (Blackler, 1951). The record in Sawers (1854) may from L. Swilly or Foyle.

***Ceramium secundatum* Lyngbye**

This name is used by Maggs and Hommersand (1993) as one of the four provisional names in the *C. rubrum* complex, frequently referred to as *C. pedicellatum* Duby.

N. Atlantic: Britain and Ireland, without further research the complete distribution is unknown.

Ireland: Cos Cork, Kerry, Clare Mayo, Donegal, Antrim and Down (Maggs and Hommersand, 1993).

Inishowen - Dunagree Pt 1998 coll. OM det. unconfirmed (BEL: F11667).

***Ceramium shuttleworthianum* (Kützing) Rabenhorst**

synonym *Ceramium acanthonotum* (Carmichael ex Harvey) J. Agardh

One of the "spiny" species, common and easily identified, often found growing on mussels (Lewis, 1964) and in relatively exposed positions.

N. Atlantic: Europe from Portugal to Iceland (South and Tittley, 1986) and generally around the British Isles.

Ireland: common in Ireland, first found in Co. Donegal by Sawers in 1853.

Donegal B. - Bundoran 1891 coll. Lea (BM); Bunatrahan 2002 coll. & det. OM; Murles Pt 1978 coll. MdeV det. OM (BEL: F1830) & 1994 (*BioMar*); Doorin Pt 2002 coll. OM; St John's Pt 1999 coll. & det. OM (BEL: F11825); Fintragh B. 1999 coll. & det. OM\ Gweebarra B. - Portnoo 2000 coll. OM\ Inishfree B. - Magheragallon 1995 coll. & det. OM (BEL: F11191)\ Sheephaven B. - Port-na-Blagh 1996 coll. & det. OM (BEL: F11283); Downies 1886 coll. JM det. OM (BEL: F3379)\ Mulroy B. - Tranafaighaboy & Gortnalughoge 1952/55 (Parkes, 1958a)\ Fanad - E. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11362)\ L. Swilly 1853 coll. WS (BEL: F7169)\ Inishtrahull 2000 coll. JN det. OM\ Inishowen - Carrickabraghy 1996 coll. McC det. CAM (TCD: A1310 & A1268); Dunagree Pt 1998 coll. & det. OM (BEL: F11669)\ L. Foyle - Saltpans Rock & Greencastle 1937/39 (Blackler, 1951). The record in Sawers (1854) may be from L. Swilly or Foyle.

***Ceramium siliquosum* (Kützing) Maggs et Hommersand**

Epiphytic in lower-littoral rock pools and sublittoral (Maggs and Hommersand, 1993).

N. Atlantic: not included in South and Tittley (1986), but recorded from Spain, France, England and Ireland, may be more be more widely distributed (Maggs and Hommersand, 1993).

Ireland: not recorded from Northern Ireland (Morton, 1994). The only Co. Donegal record is undetailed in Maggs and Hommersand (1993).

Donegal (undetailed) (Maggs and Hommersand, 1993).

***Ceramium strictum* sensu Harvey**

A valid name has not yet been determined for this species (Maggs and Hommersand, 1993).

Epiphytic and epizoic in pools from the upper shore to the low-littoral (Maggs and Hommersand, 1993).

N. Atlantic: European shores from the Azores to Iceland and in America from Quebec to New Jersey (South and Tittley, 1986); the American records require confirmation however (Maggs and Hommersand, 1993).

Ireland: Cos Cork, Waterford (Cullinane, 1973), Kerry, Clare, Galway and Dublin (Maggs and Hommersand, 1993).

Donegal B. – near St John's Pt 1999 coll. OM det. CAM (BEL: F11812)\ Inishfree B. – Magheragallon 1995 coll. & det. OM (BEL: F11211).

***Ceramiun virgatulum* Roth**

synonym *Ceramium nodulosum* (Lightfoot) Ducluzeau

Ceramium nodulosum is given as the valid name for one of the species in the *C. rubrum* complex in Maggs and Hommersand (1993).

N. Atlantic: the distribution requires reassessment but generally distributed around the British Isles (Maggs and Hommersand, 1993).

Ireland: only two records but may be more common, some of the records may be noted under *C. rubrum*.

Donegal B. – St John's Pt 1999 coll. & det. OM (BEL: F11822)\ Sheephaven B. – The Caskins 1996 coll. OM det. CAM (BEL: F11243; F11244; F11245).

***Griffithsia corallinoides* (Linnaeus) Trevisan**

South and Tittley (1986) list seven species from the North Atlantic, three of which are from the British Isles. One of these (*G. flosculose*) was transferred to *Halurus* by Maggs and Hommersand (1993). Generally epiphytic in the sublittoral. Very rare.

N. Atlantic: Portugal to the Faroës (South and Tittley, 1986) and generally around the British Isles (Maggs and Hommersand, 1993).

Ireland: from several counties (Guiry, 1978).

Mulroy B. - N. of Pan B.; Deegagh Pt; Campbells Bed; Whitemares B., Broadwater; Moross Channel; Stookan Rocks; S. of Greers I. 1993 (*BioMar*). The record in Sawers (1854) may be from L. Swilly or Foyle.

***Halurus* Kützing**

Maggs and Hommersand (1993) transferred *Griffithsia flosculosa* to *Halurus* as *H. flosculosus*.

***Halurus equisetifolius* (Lightfoot) Kützing**

Low-littoral to 14m in the sublittoral. Generally a southern species rare in the north.

N. Atlantic: Europe from Portugal to France and the British Isles (South and Tittley, 1986). Not recorded in Mull, Scotland (Price and Tittley, 1978) or North America (South and Tittley,1986).

Ireland: widely distributed in several counties (Guiry, 1978) but rare in Northern Ireland (Morton, 1994), more common on the south and west coasts (Maggs and Hommersand, 1993). First recorded in Co. Donegal in 1855.

Donegal B. - Bundoran (Duerden, 1896)\ Rathlin O'Birne area - Malin Beg Harbour 1980 coll. BEP det. CAM (UCG: 005154)\ Inishbofin B. - Meenclady B. 1996 coll. McC det. MDG (TCD: A916)\ L. Swilly - Rathmullan 1855 coll. WS (BEL: F7183).

***Halurus flosculosus* (J. Ellis) Maggs et Hommersand**

synonym *Griffithsia flosculosa* (J. Ellis) Batters

Epilithic in the very lower littoral to sublittoral at 10m or more.

N. Atlantic: Portugal to the Faroës and around the British Isles but not in America (South and Tittley, 1986; Maggs and Hommersand, 1993).

Ireland: common in several counties (Guiry, 1978) including Down and Antrim (Morton, 1994). First collected in Co. Donegal in 1853.

Donegal B. - St John's Pt 1982 coll. BEP det. CMH (BEL: F4559)\ Rathlin O'Birne - Malin Beg Harbour 1980 coll. BEP det. CAM (UCG: 005154)\ Gweebarra B. - Dunmore Hd 1943 coll. & det. MdeV (UCG: 005140)\ Rosguill - Melmore Hd (*BioMar*)\ Mulroy B. - Knox's Hole; Campbells Bed; S. of Mullaghanhardy Pt 1993 (*BioMar*); Ballyhoorisky 1944 coll. MdeV det. MDG (UCG: 005132)\ Inishowen - Tullagh B. 1943 coll. MdeV det. MDG (UCG: 005136)\ L. Foyle - Moville 1853 coll. WS (BEL: F7198); Greencastle 1937/39 (Blackler, 1951).

***Pterothamnion* Nägeli**

Pterothamnion crispum was, until recently, considered a variety of *Pterothamnion plumula*. It has now been reinstated as a separate species. However, Maggs and Hommersand (1993) point out that there are still some problems with the taxonomy. Both species are recorded from Ireland, but only *P. plumula* from Co. Donegal.

***Pterothamnion plumula* (J. Ellis) Nägeli**

synonym *Callithamnion plumula* (Ellis) Lyngbye

Lower littoral rock pools to 20m in the sublittoral. Generally distributed around the British Isles.

N. Atlantic: Portugal to Norway (Maggs and Hommersand, 1993). As South and Tittley (1986) do not separate *P. plumula* from *P. crispum*, the records of *P. plumula* in America, as given by South and Tittley (1986), may well include both species; it is indicated as present in Canada, Rhode Island and New Jersey.

Ireland: probably generally distributed. Some of the records below and in Morton (1994) probably include both species and require redetermination.

Dunglow B. - Wyon Pt 1996 coll. & det. CSE (TCD: A1176)\ Tory I. - SW of Carrickadda coll. EMS det. MDG (TCD: A363; A368)\ L. Swilly - Blackrock, Rathmullan 1853 (Sawers, 1854; MacMillan and Morton, 1979; BEL: F1544)\ L. Foyle - Moville 1855 coll. WS (BEL: F7363).

***Sphondylothamnion multifidum* (Hudson) Nägeli**

A fine alga but growing to 20cm. Epilithic in the sublittoral (Maggs and Hommersand, 1993).

N. Atlantic: south-western species in Europe from Portugal to the British Isles (South and Tittley, 1986), widespread on the western coasts of Ireland and Scotland (Maggs and

Hommersand, 1993).

Ireland: very rare, most of the recent records in Northern Ireland all recent records are from the *NISS* (Morton, 1994).

Aran I. - 1944 coll. & det. MdeV (UCG: 007789)\ Rutland Channel 1996 coll. & det. BEP (TCD: A1234)\ Mulroy B. - E. of Knox's Hole 1993 coll. & det. BEP (TCD: A79); W. of Knox's Hole 1993 (*BioMar*); Tawny 1988 coll. & det. CAM (UCG: 009091).

***Compsothamnion* (Nägeli) Schmitz**

A genus of small finely branched algae which, like *Callithamnion*, *Aglaothamnion*, *Pleonosporium* and others, need microscopic examination to be identified and are not well recorded. They may be more common than the records indicate. Further research is required in some cases.

***Compsothamnion decompositum* (J. Agardh) Maggs et L'Hardy-Halos**

synonym *Callithamnion decompositum* J. Agardh

Epilithic in the sublittoral. Only recorded from the British Isles in Co. Donegal (Maggs and Hommersand, 1993).

N. Atlantic: Portugal to the British Isles and the Faroës but not in North America (as *Callithamnion decompositum* in South and Tittley, 1986). In the British Isles, only from one site in Co. Donegal (Maggs and Hommersand, 1993).

Ireland: only one record in Co. Donegal.

Donegal (undetailed) (Maggs and Hommersand, 1993).

***Compsothamnion gracillimum* De Toni**

Generally epiphytic in the sublittoral, due to possible confusion with other species, the records should be viewed with caution as misidentification is not improbable.

N. Atlantic: Europe from Portugal to the British Isles and Norway (South and Tittley, 1986). Common on the south coast of England (Maggs and Hommersand, 1992).

Ireland: Cork (Cullinane, 1973), recorded in Northern Ireland especially in Co. Down but considered very rare (Morton, 1994). Only one old record from Co. Donegal.

L. Swilly - Rathmullan coll. WS 1855 as "*Callith. gracillm*" (BEL: F7107).

***Compsothamnion thuyoides* (J. E. Smith) Nägeli**

C. thuyoides is considered by some to be a variety *C. gracillimum* and confusion is not

improbable. Low-littoral in shaded pools and sublittoral.

N. Atlantic: Portugal to Scotland (South and Tittley, 1986), probably widely distributed in the British Isles (Maggs and Hommersand, 1993).

Ireland: only one, perhaps two, old and unconfirmed records in Northern Ireland (Morton, 1994) and only one in Co. Donegal.

Rathlin O'Birne I. 1980 (Maggs and Guiry, 1982b).

***Spermothamnion* Areschoug**

Five species of this genus are listed in South and Tittley (1986). Maggs and Hommersand (1993) reduced this to two. There are no records of *S. strictum* from Co. Donegal.

***Spermothamnion repens* (Dillwyn) Rosenvinge**

synonym *Callithamnion turneri* (Mertens) C. Agardh

A fine and variable species of the sublittoral. Growing as small tufts from a creeping axis.

N. Atlantic: European shores from the Azores to the Shetlands and in North America from Delaware to Canada (South and Tittley, 1983). Generally distributed around the British Isles.

Ireland: rare in Ireland with only three records from Co. Donegal.

Rathlin O'Birne I. 1980 (Maggs and Guiry, 1982b)\ L. Swilly 1854 coll. WS (BEL: F7403)\ L. Foyle - Moville 1856 coll. WS (McMillan and Morton, 1979; BEL: F1541).

***Pleonosporium borreri* (J. E. Smith) Nägeli**

A fine epiphytic or epizoic species of south-western shores. The specimens are small and similar to some other algae, may be more common than the records suggest.

N. Atlantic: European shores from the Azores to Norway and in North America from Massachusetts to Delaware (South and Tittley, 1986).

Ireland: only one Co. Donegal record.

Rathlin O'Birne 1996 coll. BEP det. CAM (TCD: A1249).

***Dasya hutchinsiae* Harvey**

D. hutchinsiae is the only common species of this genus in the British Isles. Grows in tufts to 7cm high. Epiphytic or epilithic in lower littoral or sublittoral to 20m deep.

N. Atlantic: Portugal to the British Isles (South and Tittley, 1986), generally south-west coasts (Maggs and Hommersand, 1993). Only one old record from Northern Ireland (Morton, 1994). All the Donegal records are recent. Very rare.

Ireland: probably not uncommon though more common further south and in the sublittoral.

Dunglow B. - Middle Sound 1996 coll. CCM (TCD: A1183); Illancrone 1996 coll. & det. PT (TCD: A1165); Wyon Pt 1996 coll. BEP det. CAM (TCD: A1187); 1997 coll. EMS det. CAM (TCD: A1175)\ Mulroy B. 1988 coll. CAM (BEL: F5930)\ Fanad [Hd] coll. & det. CAM (BEL: F11417).

***Heterosiphonia plumosa* (J. Ellis) Batters**

A fairly common species generally distributed. Epilithic or epiphytic, lower littoral and sublittoral to 30m.

N. Atlantic: Europe from Portugal to Scotland and around the British Isles (South and Tittley, 1986). Generally a western species in the British Isles and fairly common. Recorded in Northern Ireland (Morton, 1994).

Ireland: not uncommon in the sublittoral.

Donegal B. - Bundoran 1857 coll. anon (BEL: F1491); Portnagh Rock 1982 coll. & det. CMH (BEL: F3993) & coll. EMS det. CAM (TCD: A1142); Muckross Hd 1997 coll. & det. EMS (TCD: A1034)\ Rathlin O'Birne 1980 coll. & det. CAM (UCG: 005387) & 1983 coll. CMH (BEL: F4637) & 1996 det. EMS det. MDG (TCD: A1245)\ Gweebarra B. - Portnoo 1955 coll. KMD (BM)\ Dunglow B. - Wyon Pt 1996 coll. BEP det. CAM (TCD: A1209); Rutland Channel 1996 coll. PT det. CAM (TCD: A1236)\ Tory I. - Scoltmorris 1995 coll. & det. EMS (TCD: A355)\ Horn Hd 1995 coll. & det. EMS (TCD: A310)\ Rosguill - Outer Claddaghanillian B. 1993 coll. & det. EMS (TCD: A75); Melmore Hd 1993 (*BioMar*)\ Mulroy B. - 1952/55 (Parkes, 1958b); Knox's Hole 1993 (*BioMar*); Ballyhoorisky B. 1994 coll. MdeV det. MDG (UCG: 005400)\ L. Swilly - Anny Pt 1993 (*BioMar*)\ Inishtrahull - N. of Portmore 1995 coll. & det. EMS (TCD: A293)\ Inishowen - Pollan B. 1943 coll. MdeV det. MDG (UCG: 05393)\ L. Foyle - Moville to Greencastle (cast-up) & Clare (attached) 1937/39 (Blackler, 1951). The record in Sawers may be from L. Swilly or Foyle.

Delesseriaceae

***Apoglossum ruscifolium* (Turner) J. Agardh**

An attractive plant with small flat blades somewhat similar to *Membranoptera* and *Hypoglossum*. Readily identified, but sublittoral.

N. Atlantic: Europe from Portugal to the British Isles and Norway (South and Tittley, 1986).

Ireland: although Norton (1985) does not show any records from the north of Ireland, it was well recorded in the sublittoral by the *NISS* (Morton, 1994).

Donegal B. – St John's Pt 1982 coll. BEP & CMH conf. CMH (BEL: F3841); Black Rock 1996 coll. & det. CSE (TCD: A1027)\ Tory I. – Tormore 1995 coll. EMS det. CAM (TCD: A629)\ Mulroy B. – N. of Ravedy I. 1993 (*BioMar*); Gola More (possibly drift) 1997 coll. & det. OM (BEL: F11378)\ L. Foyle – Whitecastle to Drung; Greencastle to Moville (drift) 1937/39 (Blackler, 1951). The record by Sawers (1854) may be from L. Swilly or Foyle.

***Delesseria sanguinea* (Hudson) J. V. Lamouroux**

An attractive species with broad flat blades. Readily identified and well recorded in lower littoral rock pools and the sublittoral.

N. Atlantic: Portugal to Iceland, but not in North America (South and Tittley, 1986). Generally distributed.

Ireland: common.

Donegal B. – Bundoran 1891 coll. Lea (BM); Murles Pt 1994 coll. & det. MDG (UCG: 008903); Bullockmore 1984 coll. CAM 20m below CD (BEL: F5057); S. of Doorin Pt; Belta Rock; W. of Rotten Rock & Doorin Pt 1994 (*BioMar*); near St John's Pt 1999 coll. & det. OM\ Rathlin O'Birne 1980 (Maggs and Guiry, 1982b)\ Rossguill – N. of Frenchman's Rock 1993; Outer Claddaghanillian B. & E. of Melmore Hd 1993 (*BioMar*)\ Mulroy B. – N. of Ravedy I.; W. of Knox's Hole; Milstone B.; N. of Tirloughan B. & Dundooan Rocks 1993 (*BioMar*)\ L. Swilly – S. side of Anny Pt & W. of Dunree Hd 1993 (*BioMar*)\ L. Foyle – Greencastle 1937/39 (Blackler, 1951).

***Membranoptera alata* (Hudson) Stackhouse**

At first sight similar to *Hypoglossum* and *Apoglossum*. The three species are quite distinct and attractive, they are well recorded. Low-littoral rock pools.

N. Atlantic: Europe from Spain, to Iceland and Greenland, in North America from Canada to Massachusetts (South and Tittley, 1986), generally distributed around the British Isles (Norton, 1985).

Ireland: common.

Donegal B. – Bundoran (undated) (BEL: F2655); 1891 coll. Lea (BM); Murles Pt 1994 coll. & det. MDG (UCG: 008892); St John's Pt 1999 coll. & det. OM; Rolagh, Kilcar 1980 coll.

EM det. MDG (UCG: 006078)\ Gweebarra B. - Portnoo 2000 coll. & det. OM\ Inishfree B. - Maghergallon 1995 coll. & det. OM (BEL: F11206); Brinlack Port 1996 coll. McC (TCD: A911 & A858)\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11267)\ Mulroy B. - 1952/55 (Parkes, 1958b); S. of Greers I. 1993 (*BioMar*)\ L. Swilly - "Mrs Ovens & Major Martin" pre-1857 (Landsborough, 1857)\ Inishowen - Pollan B. 1943 coll. MdeV det. MDG (UCG: 006094); Esky B. 1943 coll. MdeV det. MDG (UCG: 006095); Bulbinbeg & Dunagree Pt 1998 coll. & det. OM\ L. Foyle - Moville 1854 coll. WS (BEL: F7244); Greencastle to Redcastle 1937/39 (Blackler, 1951).

***Nitophyllum punctatum* (Stackhouse) Greville**

Epilithic and epizoic in the lower littoral and sublittoral to 24m (Maggs and Hommersand, 1993).

N. Atlantic: Europe from the Azores to the Shetlands and generally around the British Isles.

Ireland: not uncommon in Co. Donegal.

Donegal B. - Bundoran (drift) 1975 coll. & det. OM (BEL: F109); Studdagh Rock 1996 coll. EMS det. CAM (TCD: A1153); Carrigan Hd 1996 coll. EMS det. CAM (TCD: A1220; A998) & det. EMS (TCD: A1002)\ Tory I. - W. Town, SW of Tormore 1995 coll. EMS also CCM det. CAM (TCD: A628; A633); End of Tormore 1995 coll. & det. EMS (TCD: A340)\ Horn Hd 1995 coll. & det. EMS (TCD: A315)\ Rosguill - E. of Melmore Hd 1993 (*BioMar*)\ Mulroy B. - Mulroy B. 1952/55 (Parkes, 1958b); N. of Ravedy I. 1993 (*BioMar*); Ballyhoorisky 1944 coll. & det. MdeV (UCG: 006441). Middle I. 1995 coll. & det. EMS (TCD: A304)\ Inishtrahull - N. of Portmore 1995 coll. & det. EMS (TCD: A286)\ L. Foyle - Greencastle 1937/39 (Blackler, 1951); Moville 1853 coll. WS (BEL: F7270; F7268; McMillan and Morton, 1979; F1502).

***Hypoglossum hypoglossoides* (Stackhouse) F. S. Collins et Hervey**

synonym *Delesseria hypoglossum* (Woodward) J. V. Lamouroux

A not uncommon species of the lower littoral rock pools and into the deep sublittoral.

N. Atlantic: European coasts from the Azores to the Shetlands and generally around the British Isles (South and Tittley, 1986).

Ireland: well recorded in Co. Donegal although there are no records in Norton (1985). Not uncommon in Northern Ireland (Morton, 1994).

Donegal B. - Belta Rock & Doorin Pt 1994 (*BioMar*); Studdagh Rock coll. & det. EMS 1996 (TCD: A1155); St John's Pt 1982 coll. & det. BEP (UCG: 005418); Bullockmore 1984 coll. CMH (sublittoral) (BEL: F5058); Carrigan Hd 1996 coll. & det. EMS (TCD: A1004)\ Rathlin O'Birne 1996 coll. & det. EMS (TCD: A1022)\ Tory I. - Tormore 1995 coll. EMS det. MDG (TCD: A337); Scoltmorris 1995 coll. & det. EMS (TCD: A348)\ Rosguill - Outer Claddaghanillian B.; E. of Melmore Hd; Limeburners Rock (*BioMar*)\ Mulroy B. - 1952/55 (Parkes, 1958b); Ravedy I. 1993 (*BioMar*); Campbells Bed 1993 (*BioMar*)\ L. Swilly - Anny Pt; Dunree Hd 1993 (*BioMar*) also noted as collected in L. Swilly by Major Martin (Johnson and Croall, 1859; Landsborough, 1857)\ Inishtrahull - SW Scarony 1995 coll. & det. EMS (TCD: A276)\ Middle I. 1995 coll. & det. EMS (TCD: A302)\ L. Foyle - Mouth of L. Foyle undated coll. WS (BEL: F7220); N. Moville 1853 coll. WS (BEL: F3336); Moville 1854 probably coll. by WS (McMillan and Morton, 1979; BEL: F1500) & Ravenscliffe 1937/39 (Blackler, 1951).

***Radicilingua thysanorhizans* (Holmes) Papenfuss**

On gravel, stones and other unstable habitats, sublittoral, in areas with strong tidal currents or exposed (Maggs and Hommersand, 1993). A south-western species.

N. Atlantic: Portugal to England (South and Tittley, 1986).

Ireland: Maggs and Hommersand (1993) state it to be widely distributed in Ireland except for the central eastern coast. All records from Northern Ireland are sublittoral (Morton, 1994).

Donegal B. - Carrigan Hd 1996 coll. & det. EMS (TCD: A1014)\ Rathlin O'Birne 1996 coll. & det. BEP (TCD: A1043; A1044)\ Tory I. - Tormore 1995 coll. EMS det. MDG (TCD: A330)\ Rosguill - Outer Claddaghanillian B. 1993 coll. & det. BEP (TCD: A66)\ Mulroy B. 1993 (*BioMar*)\ Inishtrahul - SW Scarony 1995 coll. & det. EMS (TCD: A279)\ Inishowen - Middle I. 1995 coll. EMS det. MDG (TCD: A301).

***Acrosorium venulosum* (Zanardini) Kylin**

synonym *Acrosorium unciatum* (Turner) Kylin

Cryptopleura ramosa var. *uncinata* closely resembles *A. venulosum* and old records, unless confirmed, are very doubtful.

N. Atlantic: Azores to Scotland with world-wide distribution (Maggs and Hommersand, 1993).

Ireland: identification not easy, possibly under-recorded.

Donegal B. - St John's Pt 1999 coll. & det. OM (BEL: F11817); S. of Muckross Hd 1997 coll. EMS & det. MDG (TCD: A1037)\ Rathlin O'Birne - SE Rathlin O'Birne 1980 coll. & det. CAM (UCG: 002595; Maggs and Guiry, 1982b) & 1996 coll. EMS det. MDG & EMS (TCD: A1008; A1015; A1023); Black Rock 1996 coll. EMS & det. MDG (TCD: A1041); Inlet N. of Lighthouse, Rathlin O'Birne 1983 coll. & det. CMH (BEL: F4962)\ Tory Is - End of Tormore 1995 coll. & det. EMS (TCD: A341)\ Sheephaven B. - N. of Horn Hd 1995 coll. & det. EMS (TCD: A307)\ Rosguill - Frenchman's Rock 1993; Limeburners Rock 1993; Outer Claddaghanillian B. 1993; Melmore Hd 1993 (all *BioMar*)\ Mulroy B. - Ravedy I. 1993 (*BioMar*)\ L. Swilly - Anny Pt 1993 (*BioMar*)\ Inishowen - N. of Portmore 1995 coll. & det. EMS (TCD: A289)\ L. Foyle - Grencastle coll. WS (BEL: F7087).

***Cryptopleura ramosa* (Hudson) Kylin ex Lily Newton**

Maggs and Hommersand (1993) describe the distinctions between *Cryptopleura ramosa* and *Acrosorium venulosum*. However, the species are similar and there may be some confusion, mis-identifications are possible.

N. Atlantic: eastern shores of the Atlantic from Portugal to the Faroës and very common around the British Isles. Not found in North America (South and Tittley, 1986).

Ireland: very common from the lower littoral into the sublittoral.

Donegal B. - Bunatrahan 2002 coll. & det. OM (BEL: F11968); Coolmore 1955 coll. KMD (BM); Bundoran 1840 possibly coll. GCH (BEL: F7112); 1891 coll. Lea (BM) & 1975 coll. & det. OM drift (BEL: F108); Doorin Pt 1994 (*BioMar*); Murles Pt 1994 coll. & det. MDG (UCG: 008891); Bullockmore 1984 coll. & det. CMH (BEL: F5052); St John's Pt 1982 coll. BEP & CAM (UCG: 004084; UCG: 004085; UCG: 004082; BEL: F3815; F3818) & 1989 coll. & det. CAM (UCG: 009103); Rolagh, Kilcar 1980 coll. EM det. MDG (UCG: 004004)\ Rathlin O'Birne - Malin Hd Harbour 1980 coll. BEP det. CAM (UCG: 003995; Maggs and Guiry, 1982b); W. Rathlin O'Birne I. 1980 coll. & det. CAM (UCG: 003993)\ Gweebarra B. - Portnoo 1955 coll. KMD (BM)\ Dunglow - NE Terman 1996 coll. MCG (TCD: A863)\ Inishbofin B. - Meenclady B. 1996 coll. McC (TCD: A880)\ Sheephaven B. - Duncap I. 1995 coll. EMS det. MDG (TCD: A313); The Caskins 1996 coll. & det. OM (BEL: F11266)\ Tory I. - End of Tormore 1995 coll. EMS det. MDG (TCD: A328) & det. EMS (TCD: A344)\ Rosguill - Frenchman's Rock & Melmore Hd 1993 (*BioMar*); Limeburners Rock 1993

(*BioMar*); Claddaghanillian 1993 coll. EMS det. MDG (*BioMar*; TCD: A76)\ Mulroy B. - Ravedy I. 1993; Knox's Hole 1993; Tirloughan B. 1993; Mark's Point (2) 1993 & Ballyhoorisky Pt 1993 (all *BioMar*). Fanad - E. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11350 & F11351)\ Inishtrahull - Gull I. 1995 coll. BEP det. MDG (TCD: A283) also coll. & det. EMS (TCD: A280)\ L. Swilly - Anny Pt 1993 (*BioMar*)\ Inishowen - Pollan B. 1943 coll. Brennan det. MdeV (UCG: 004077); Whitestrand B. 1943 coll. & det. MdeV (UCG: 004103); N. of Portmore 1995 coll. EMS det. MDG & EMS (TCD: A291 & A287); Esky B. 1944 coll. & det. MdeV (UCG: 004102); Bulbinbeg 1998 coll. & det. OM (BEL: F11651) det. CAM (BEL: F11650)\ L. Foyle - Greencastle 1937/39 (Blackler, 1951: det. as *Cryptopleura lacerata*); Moville (dredged) 1937/39 (Blackler, 1951: as *Acrosorium reptans*).

***Haraldiophyllum bonnemaisonii* (Kylin) A. D. Zinova**

synonym *Myriogramme bonnemaisonii* Kylin

Epilithic and epiphytic in exposed areas, sublittoral (Maggs and Hommersand, 1993).

N. Atlantic: Spain, France the British Isles to the Shetlands but not in North America (South and Tittley, 1986).

Ireland: being sublittoral it is probably under-recorded. There are two old record from Co. Donegal and several old records from Northern Ireland (Morton, 1994), the rest are recent records.

Donegal B. - Carrigan Hd 1996 coll. EMS det. MDG (TCD: A999); Bundoran 1866 probably coll. Captain Cary (Cullinane and Whelan, 1984); Portnagh Rock 1982 coll. BEP det. CAM (BEL: F3792); 1996 coll. CSE det. MDG (TCD: A996)\ Rathlin O'Birne - The Stack 1980 coll. BEP det. CAM (UCG: 006291); W. Rathlin O'Birne Is 1980 coll. & det. CAM (UCG: 006307); near Rathlin O'Birne (Norton, 1985); S. Rathlin O'Birne 1996 coll. EMS det. MDG (TCD: A1009; A1030); Gloster Rock 1996 coll. BEP det. MDG (TCD: A1028); Black Rock 1996 coll. PT det. MDG (TCD: A1021 also A1039; A1042)\ Tory I. - Rinnamorrenny 1995 coll. EMS det. MDG (TCD: A352); Marnid Pt 1995 coll. EMS det. MDG (TCD: A356)\ Sheephaven B. - Duncap Is 1995 coll. EMS & det. MDG (TCD: A314)\ Rosguill - Melmore Hd & Outer Claddaghanillian B. 1993 (*BioMar*)\ Mulroy B. - Knox's Hole 1993 (*BioMar*)\ L. Swilly - Anny Pt 1993 (*BioMar*)\ Inishowen - Middle I. 1995 coll. EMS det. MDG (TCD: A298)\ L. Foyle - Moville 1855 coll. WS (BEL: F7261).

***Erythroglossum laciniatum* (Lightfoot) Maggs et Hommersand**

synonym *Polyneura laciniata* (Lightfoot) Kylin

synonym *Polyneura gmelinii* (J. V. Lamouroux) Kylin

A very variable species, generally sublittoral to 30m.

N. Atlantic: Spain and Portugal to the Shetlands (South and Tittley, 1986).

Ireland: widely distributed in the sublittoral. Not uncommon in the sublittoral in Northern Ireland (Morton, 1994).

Donegal B. - S. of Doorin Pt 1994 coll. EMS det. CAM (TCD: A593); Portnagh Rock 1996 coll. EMS det. CAM (TCD: A1225 & A1140) & coll. PT det. CAM (TCD: A1145); Belta Rock 1994 coll. EMS det. MDG (TCD: A171); Studdagh Rock 1996 coll. & det. EMS (TCD: A1159); St John's Pt 1982 coll. CMH (BEL: F3799; UCG: 006926) & 1989 coll. & det. CAM (UCG: 009095); SE of Carrigan Hd 1996 coll. EMS det. CAM (TCD: A1219)\ Mulroy B. - Knox's Hole; Millstone B.; Tirloughan B. 1993 (*BioMar*)\ L. Foyle - Greencastle 1937/39 (Blackler, 1951).

***Phycodrys rubens* (Linnaeus) Batters**

A attractive, readily identifiable and well recorded species. It is well represented in some old collections.

N. Atlantic: widely distributed on both sides of the Atlantic. Europe from Portugal to Spitzberegen, Iceland, Greenland and in North America from Canada to New Jersey (South and Tittley, 1986).

Ireland: common.

Donegal B. - Doorin Pt 1994 (*BioMar*); St John's Pt 1989 coll. & det. CAM (UCG: 009092); Studdagh Rock 1996 coll. & det. EMS (TCD: A1150); Muckross Hd 1997 coll. & det. EMS (TCD: A1035)\ Rathlin O'Birne 1980 coll. & det. CAM (UCG: 006595; Maggs and Guiry, 1982b)\ Gweebarra B. - S. Dawros B. 1996 coll. McC det. MDG (TCD: A841); Dunmore Hd 1943 coll. & det. MdeV (UCG: 006587)\ Sheephaven B. - Duncap Is 1995 coll. & det. EMS (TCD: A317)\ Rosguill - Outer Claddaghanillian B.; Melmore Hd 1993 (*BioMar*)\ S. side of Limeburners Rock 1993 (*BioMar*)\ Mulroy B. - 1952/55 (Parkes, 1958b); Knox's Hole; Tirloughan B. 1993 (*BioMar*)\ L. Swilly - W. of Dunree Hd 1993 (*BioMar*)\ L. Foyle - Moville 1854 coll. WS (BEL: F7290). The record in Sawers (1854) may be from L. Swilly or

Foyle.

***Drachiella* Ernst et J. Feldmann**

South and Tittley (1986) list only one species, *D. spectabilis*. Maggs and Hommersand (1993) list two additionional species: *D. minuata*, previously known as *Myriogramme minuata* and *D. heterocarpa*, transferred from *Halymenia heterocarpa*.

***Drachiella heterocarpa* (Chauvin ex Duby) Maggs et Hommersand**

synonym *Myriogramme heterocarpum* (Chauvin ex Duby) Ernst et Feldmann

Maggs and Hommersand (1993) comment that "Although this species is currently known as *Myriogramme heterocarpum* (Chauvin ex Duby) Ernst & Feldmann, this combination was not made by Ernst and Feldmann (1957)".

Epilithic in the sublittoral, a south-western species reaching its northern limit at the Skerries in Northern Ireland (*NISS*).

N. Atlantic: northern Spain to France, Ireland and England (South and Tittley, 1986).

Ireland: rare.

Donegal B. - Portnagh Pock 1997 coll. CSE det. CAM (TCD: A1143 & A1144).

***Drachiella spectabilis* J. Ernst et Feldmann**

First recorded from Ireland in 1980 by Maggs and Guiry (1982b). Mainly south-westerly on exposed shores in the sublittoral to a depth of 30m (Maggs and Hommersand, 1993).

N. Atlantic: previously recorded from France, England and Wales (South and Tittley, 1986).

Ireland: only recently recorded.

Donegal B. - Rotten Rock 1994 (*BioMar*); St John's Pt 1982 coll. CMH det. CAM (UCG: 004504)\ Rathlin O'Birne 1980 coll. & det. CAM (UCG: 004509; BM; Maggs and Guiry, 1982b)\ Tory I. -1995 coll. & det. BEP (TCD: A326); Scoltmorris 1995 coll. & det. EMS (TCD: A324)\ Sheephaven B. - Duncap I. 1995 coll. EMS det. MDG (TCD: A311)\ Rosguill - Outer Claddaghanillian B. 1993 coll. & det. BEP (TCD: A60); Melmore Hd 1993 (*BioMar*)\ Mulroy B. - Ravedy I. 1993 (*BioMar*)\ Inistrahull - N. of Portmore 1995 coll. & det. BEP (TCD: A296).

Rhodomelaceae

***Boergeseniella fruticulosa* (Wulfen) Kylin**

synonym *Polysiphonia fruticulosa* (Wulfen) Sprengel

Growing as much-branched tufts up to 15cm long. A common south-western species epiphytic or epilithic, littoral and sublittoral (Maggs and Hommersand, 1993).

N. Atlantic: Azores to the British Isles and the Faroës (South and Tittley, 1986).

Ireland: very rare in the north of Ireland and in Northern Ireland all the records are of the 19th century (Morton, 1994). Possibly under-recorded on the west coast.

Donegal B. - Doorin Pt 1989 coll. & det. CAM (UCG: 009128); Murles 1978 coll. MdeV (BEL: F1818)\ Mulroy B. - Sladdannavooghog 1952/55 (Parkes, 1958a).

***Boergeseniella thuyoides* (Harvey) Kylin**

synonym *Pterosiphonia thuyoides* (Harvey) F.Schmitz

Forming much-branched tufts up to 15cm long. A common south-western species of the lower and sublittoral.

N. Atlantic: Portugal to the British Isles northwards to Orkney (South and Tittley, 1986). Rare in Scotland, Mull apparently being its northern limit (Price and Tittley, 1978).

Ireland: recorded from most coastal counties in Ireland (Guiry, 1978) but with few recent records in Northern Ireland (Morton, 1994) and few in Co. Donegal.

Donegal B. - Coolmore, Rossnowlagh 1955 coll. KMD (BM); Muckross Hd 1996 coll. PD det. CAM (TCD: A1319)\ Inishbofin B. - Meenclady B. 1995 coll. McC det. MDG (TCD: A926)\ L. Foyle - Clare 1937/39 (Blackler, 1951). The record in Sawers (1854) may be from L. Swilly or Foyle.

***Bostrychia scorpioides* (Hudson) Montagne ex Kützing**

Growing on rock or mud at extreme high water mark in sheltered situations, and possibly overlooked.

N. Atlantic: Portugal to the south western coasts of the British Isles and Orkney (South and Tittley, 1986; Maggs and Hommersand, 1993).

Ireland: probably locally common, recorded from most coastal counties, however there is only one Co. Donegal record.

Mulroy B. 1952/55 (Parkes, 1958b).

***Brongniartella byssoides* (Goodenough et Woodward) F. Schmitz**

Epilithic and epiphytic in the sublittoral to depths of 30m on unstable surfaces (Maggs and Hommersand, 1993).

N. Atlantic: Portugal, around the British Isles to the Shetlands and Norway (South and Tittley, 1986).

Ireland: generally distributed and comparatively common in Co. Donegal. Few records from Northern Ireland all of which are 19th century (Morton, 1994).

Donegal B. - Bullockmore 1984 coll. CAM (BEL: F5050); Studdagh Rock 1996 coll. CSE det. CAM (TCD: A1162)\ Rathlin O'Birne 1983 coll. CAM (BEL: F4638)\ Gweebarra B. - Portnoo 1955 coll. KMD (BM)\ Dunglow B. - W. Inishmeal 1996 coll. CSE det. CAM (TCD: A1160); Toninishgun Pt 1996 coll. EMS det. CAM (TCD: A1229); Aranmore Is 1944 coll. Brennan det. MdeV (UCG: 001913; 002912)\ Inishfree I. 1944 coll. Brennan det. MdeV (UCG: 002904)\ Inishbofin B. - Meenlaragh 1944 coll. Brennan det. MdeV (UCG: 002918)\ Mulroy B. - Ravedy I.; Pan B. 1993 (*BioMar*)\ L. Swilly - Anny Pt 1993 (*BioMar*)\ Inishtrahull - N. of Portmore 1995 coll. & det. EMS (TCD: A292)\ L. Foyle - Greencastle; Clare; Redcastle; Drung; Whitecastle & cast up near Moville 1937/39 (Blackler, 1951)\ Moville 1853 & 1855 coll. WS (BEL: F7097 & F3329). The record in Sawers (1854) may be from L. Swilly or Foyle.

***Chondria* C. Agardh**

Three species of this genus are recorded from the British Isles. One of these, *Chondria coerulescens*, is found in the British Isles only in the south coasts of England (Maggs and Hommersand, 1993) and is not found in Ireland at all.

***Chondria capillaris* (Hudson) M. J. Wynne**

synonym *Chondria tenuissima* C. Agardh

Lower littoral and sublittoral in moderately exposed sites.

N. Atlantic: Europe from the Azores to Ireland and England and in North America from Connecticut to Virginia (South and Tittley, 1986).

Ireland: only one record, not supported by a voucher specimen, from Co. Donegal and none from Northern Ireland (Morton, 1994).

L. Foyle - Drung & Greencastle 1937/39 (Blackler, 1951).

***Chondria dasyphylla* (Woodward) C. Agardh**

Epilithic in the mid to sublittoral and widely distributed in the British Isles.

N. Atlantic: Europe from Portugal to the British Isles and in North America from New Hampshire to Virginia (South and Tittley, 1986).

Ireland: occasional, very rare in Northern Ireland (Morton, 1994).

Gweebarra B. - Portnoo 1955 coll. KMD (BM)\ Dunglow B. - Wyon Pt 1996 coll. BEP det. CAM (TCD: A1191) also coll. & det. EMS (TCD: A1192); Rutland South Channel 1996 coll. & det. EMS (TCD: A1051)\ Mulroy B. 1952/55 (Parkes, 1958b); Back Lough Narrows 1993 coll. BEP det. MDG (TCD: A39)\ L. Foyle - Moville 1854 coll. & det. WS (BEL: F7099); Clare (growing); Magilligan; Moville & Carnagarve (dredged) 1937/39 (Blackler, 1951). The record in Sawers (1854) may be from L. Swilly or Foyle.

***Laurencia* Nägeli**

Parke and Dixon (1976) included only three species of *Laurencia* in their check-list, South and Tittley (1986) listed four. Maggs and Hommersand (1993) added a further two and noted that it had been proposed that all the British species of *Laurencia* save *L. obtusa* and *L. pyrimidalis* should be moved to *Osmundea* Stackhouse. This was agreed in Hardy and Guiry (2003). As *L. pyrimidalis* is found on the very south coast of Britain, *Laurencia obtusa* is the only species of the genus found in Ireland.

***Laurencia obtusa* (Hudson) J. V. Lamouroux**

Epiphytic, midlittoral to sublittoral. Several growth forms were formerly considered.

N. Atlantic: Europe from the Canaries and the British Isles. Other records, Azores and France, are uncertain as they may be varieties now considered to be separate species (Maggs and Hommersand, 1993).

Ireland: occasional.

Donegal B. - Bundoran, undetailed (BEL: F2706); Doorin Pt 1989 coll. & det. CAM (UCG: 009127; Foster and Dring, 1994)\ Gweebarra B. - Rossbeg 1955 coll. & det. MdeV (UCG: 008702)\ Mulroy B. - 1952/55 (Parkes, 1958b).

***Odonthalia dentata* (Linnaeus) Lyngbye**

A common northern species reaching its southen limits in the British Isles.

N. Atlantic: British Isles, Norway, the Baltic, Iceland, Spitzbergen, Greenland and Canada

(South and Tittley, 1986).

Ireland: six sites in Co. Donegal are shown in Norton (1985). Common in Northern Ireland (Morton, 1994) and Co. Donegal where it reaches its southern limit.

Donegal B. - Studdagh Rock 1996 coll. & det. CSE (TCD: A1146)\ Dunglow B. - Arranmore Is 1944 coll. & det. MdeV (UCG: 006470)\ Inishfree - Bunbeg 1944 coll. & det. MdeV (UCG: 006473)\ Inishbofin B. - Meenlaragh 1944 coll. & det. MdeV (UCG: 006468)\ Sheephaven B. - Downies 1944 coll. & det. MdeV (UCG: 006467; 006469)\ Mulroy B. - Mulroy B. 1952/55 (Parkes, 1958b); Ballyhoorisky 1944 coll. & det. MdeV (UCG: 006471) & Ballyhoorisky Pt 1993 coll. BEP det. MDG (TCD: A42)\ Inishtrahull - Middle I. 1995 coll. & det. CSE (TCD: A303)\ Inishowen - Pollan B. 1943 coll. & det. MdeV (UCG: 006466)\ L. Foyle - Greencastle 1937/39 (Blackler, 1951). The record in Sawers (1854) may be from L. Swilly or Foyle.

***Osmundea* Stackhouse**

The two genera *Laurencia* and *Osmundea* are separated in Guiry (1997), with five species in *Osmundea*, see *Laurencia* above. It is probable that, as a result, there may be some mis-identifications of the older records.

***Osmundea hybrida* (A. P. de Candolle) K. W. Nam**

synonym *Laurencia hybrida* (A. P. de Candolle) J. V. Lestiboudois

Epilithic in mid to lower littoral, generally distributed but not common around the British Isles.

N. Atlantic: Portugal to the Shetlands (South and Tittley, 1986; Maggs and Hommersand, 1993).

Ireland: common in Northern Ireland (Morton, 1994) but not so commonly recorded in Co. Donegal.

Donegal B. - Murles Pt 1994 (*BioMar*), 1994 coll. et det. MDG (UCG: 0008886)\ Inishowen - Bulbinbeg 1998 coll. & det. OM (BEL: F11639)\ L. Swilly - undated coll. WS (BEL: F7228)\ L. Foyle - Drung to Whitecastle 1937/39 (Blackler, 1951).

***Osmundea osmunda* (S. G. Gmelin) K. W. Nam et Maggs**

synonym *Laurencia osmunda* (S. G. Gmelin) Maggs et Hommersand

Epilithic and epiphytic from very low-littoral to sublittoral.

N. Atlantic: France, Netherlands and the British Isles (Maggs and Hommersand, 1993).

Ireland: older records of this species are in doubt until they are re-determined.

Donegal B. - Murles Pt 1994 coll. MDG (UCG: 008900)\ Mulroy B. - Ballyhoorisky Pt coll. BEP & det. MDG 1993 (TCD: A40)\ L. Swilly - Portnagarribane 1993 coll. CCM det. MDG (TCD: A43)\ Inishowen - Carrickbraghy 1996 (TCD: A921).

***Osmundea pinnatifida* (Hudson) Stackhouse**

synonym *Laurencia pinnatifida* (Hudson) J. V. Lamouroux

Epilithic in the mid-littoral to low-water, common and often found covering quite large areas.

N. Atlantic: Portugal to the Shetlands and generally distributed around the British Isles (Maggs and Hommersand, 1993).

Ireland: the most common species of the genus, forming distinct zones in places and growing well in shaded sites.

Donegal B. - Bundoran 1840 (BEL: F7235 also F2639 undated); 1850 (TCD); 1891 coll. Lea (BM); 1955 coll. Dickinson (BM); 1975 coll. & det. OM (BEL: F102); Bunatrahan 2002 coll. & det. OM (BEL: F11962); Murles Pt 1994 (*BioMar*); Doorin Pt 2002 coll. OM; near Killybegs (Norton, 1985); Fintragh B. 1999 coll. OM; Rolagh, Kilcar 1980 coll. EM det. MDG (UCG: 0005625)\ Gweebarra B. - Portnoo 2000 coll. & det. OM. Sheephaven B. - Port-na-Blagh 1996 coll. & det. OM (BEL: F11289); The Caskins 1996 coll. & det. OM (BEL: F11265)\ Mulroy B. - Sladdannavooghog 1952/55 (Parkes, 1958a); Ballyhoorisky Pt pre-1950 (Brennan, 1950); 1993 (*BioMar*); Mark's Pt; Gortnatraw B. both 1993 (both *BioMar*)\ Fanad - N. Ballymastocker B. 1997 coll. & det. OM (BEL: F11372)\ L. Swilly - Great Pollet Arch 1993 (*BioMar*)\ Inishtrahull 2000 coll. JN det. OM (BEL: F11942)\ Inishowen - Malin Hd 1863 coll. JM (BEL: F3365)\ L. Foyle - Drung to Greencastle 1937/39 (Blackler, 1951); Greencastle (undated) coll. WS (BEL: F7237).

***Osmundea ramosissima* (Oeder) Athanasiadis**

Most specimens identified as *O. truncata* are probably *O. ramosisssima*. Usually epiphytic on *Fucus* in the mid to lower littoral (Maggs and Hommersand, 1993).

N. Atlantic: distribution probably confused due to taxonomic changes. Europe from France to the British Isles and the south of Norway (Maggs and Hommersand, 1993).

Ireland: only one confirmed record, but probably under-recorded.

Donegal B. - Doorin Pt 1989 coll. & det. CAM (UCG: 009130).

***Polysiphonia* Greville**

Maggs and Hommersand (1993) and Hardy and Guiry (2003) list 19 species of this genus in the British Isles excluding species placed in *Boergesniella* and *Pterosiphonia*. A total of 14 of these have been recorded from Co. Donegal. However, some species are not easily identified and misidentifications are not unlikely.

***Polysiphonia atlantica* Kapraun et J. N. Norris**

synonym *Polysiphonia macrocarpa* Harvey

Epizoic and epiphytic in the littoral zone.

N. Atlantic: European shores from Portugal to the Shetlands (South and Tittley, 1986), also in the west Atlantic. Mainly on the south and west coasts of the British Isles (Maggs and Hommersand, 1993).

Ireland: several counties in Ireland (Guiry, 1978). Noted as common but under-recorded in Northern Ireland (Morton, 1994).

Gweebarra B. - Portnoo 2000 coll. & det. OM (BEL: F11908)\ L. Foyle - Greencastle & Saltpans Rock 1937/39 (Blackler, 1951).

***Polysiphonia brodiei* (Dillwyn) Sprengel**

Epilithic and epiphytic in rock pools from the mid-littoral to 8m sublittoral (Maggs and Hommersand, 1993).

N. Atlantic: Portugal northwards to the Faroës and Norway and from Canada in North America (South and Tittley, 1986). Commonly distributed around the British Isles (Maggs and Hommersand, 1993).

Ireland: common.

Donegal B. - Murles 1978 coll. MdeV (BEL: F1826); Muckross Hd 1996 coll. PD det. CAM (TCD: A1279)\ W. of Black Rock 1996 coll. CSE det. CAM (TCD: A1218)\ Inishfree B. - Gweedore B. 1995 coll. & det. OM (BEL: F11199)\ Dunglow B. - NE Terman 1996 coll. McC det. CAM (TCD: A1290)\ Inishfree B. - Brinkack Port 1996 coll. McC det. CAM (TCD: A1297)\ Fanad - Fanad Hd 1989 coll. & det. CAM (UCG: 009121)\ L. Swilly - Great Pollet Arch 1993 coll. CSE det. CAM (TCD: A561)\ Inishowen - Carrickabrachy 1996 coll. McC det. MDG (TCD: A873; A874; A1309; A1254). The record in Sawers (1854) may be from L.

Swilly or Foyle.

***Polysiphonia elongata* (Hudson) Sprengel**

Generally in littoral pools and the sublittoral to 27m depth (Maggs and Hommersand, 1993).

N. Atlantic: Portugal to the Faroës and Canada (South and Tittley, 1986), generally distributed around the British Isles (Maggs and Hommersand, 1993).

Ireland: common.

Donegal B. - Murles Pt 1994 coll. & det. MDG (UCG: 008887; *BioMar*)\ Dunglow B. - Wyon Pt 1996 coll. EMS det. CAM (TCD: A188)\ Inishowen - Portmore Harbour 1995 coll. EMS det. CAM (TCD: A626)\ L. Foyle - near Greencastle *circa* 1850s coll. WS (BEL: F7315); Moville 1853 coll. WS (BEL: F3335) & 1937/39 (Blackler, 1951). The record in Sawers (1854) may be from L. Swilly of Foyle.

***Polysiphonia elongella* Harvey**

Epiphytic and epilithic from very low-littoral to sublittoral. Older records require redetermination.

N. Atlantic: Europe from France to the Shetlands (South and Tittley, 1986).

Ireland: no recent records from Northern Ireland (Morton, 1994) or Co. Donegal.

L. Foyle - near Greencastle *circa* 1850s coll. WS (BEL: F7317). The record in Sawers (1854) may be from L. Swilly or Foyle.

***Polysiphonia fibrata* (Dillwyn) Harvey**

Epiphytic and epizoic generally midlittoral to lower littoral.

N. Atlantic: Europe from Spain and France to the British Isles and the Shetlands (South and Tittley, 1986), widely distributed in the British Isles (Maggs and Hommersand, 1993).

Ireland: rare.

Donegal B. - St John's Pt 1989 coll. & det. CAM (UCG: 009106)\ Gweebarra B. - Portnoo 2000 coll. & det. OM (BEL: F11911)\ Inishowen - Carrickabrady 1996 coll. McC det. CAM (TCD: A1315)\ Fanad Hd 1989 coll. & det. CAM (UCG: 009122)\ L. Foyle - Greencastle 1937/39 (Blackler, 1951).

***Polysiphonia fibrillosa* (Dillwyn) Sprengel**

synonym *Polysiphonia violaceae sensu* Harvey

From lower littoral rock pools to the sublittoral. Maggs and Hommersand (1993) note the

variability in this species.

N. Atlantic: generally distributed from France, around the British Isles, to Norway (Maggs and Hommersand, 1993).

Ireland: extremely rare.

Inishfree B. - near Magheragallon 1995 coll. & det. OM (BEL: F11190). The record in Sawers (1854) may be from L. Swilly or Foyle.

***Polysiphonia fucoides* (Hudson) Greville**

synonym *Polysiphonia nigrescens* (Hudson) Greville ex Harvey

synonym *Polysiphonia violaceae* (Roth) Sprengel

Epilithic from the midlittoral to at least 20m depth (Maggs and Hommersand, 1993).

N. Atlantic: Portugal to the British Isles and the Shetlands, on the west coast of North America from Newfoundland to North Carolina (Maggs and Hommersand, 1993).

Ireland: probably fairly common around the shores.

Donegal B. - Bunatrahan 2002 coll. & det. OM (BEL: F11973); Murles 1978 coll. MdeV (BEL: F1819)\ Dunglow B. - Rutland 1996 coll. EMS det. CAM (TCD: A1217); Rutland South Channel 1996 coll. PT det. CAM (TCD: A1244)\ Mulroy B. 1952/55 (Parkes, 1958b); Gortnatraw B. 1993 coll. CSE det. CAM (TCD: A563)\ L. Swilly - Anny Pt 1993 coll. & det. CSE (TCD: A54)\ L. Foyle - Greencastle 1852 coll. WS (BEL: F7336); 1937/39 (Blackler, 1951); Whitecastle to Moville; dredged off Carnagarve & Magilligan 1937/39 (Blackler, 1951). The record in Sawers (1854) may be from L. Swilly or Foyle.

***Polysiphonia furcellata* (C. Agardh) Harvey**

Loose-lying or attached, generally in the sublittoral (Maggs and Hommersand, 1993).

N. Atlantic: Portugal to the south and west coasts of the British Isles, also the Isle of Man, the Channel Isles, the Canaries, but not in North America (South and Tittley, 1986; Maggs and Hommersand, 1993).

Ireland: one old, and unconfirmed, record from Northern Ireland (Morton, 1994).

The only record from "Donegal" is undetailed in Maggs and Hommersand (1993).

***Polysiphonia harveyi* J. Bailey**

This species has only recently been recognized in the British Isles (Maggs and Hommersand, 1993). Epiphytic from high water to lower littoral.

N. Atlantic: Europe from France to Norway and on the east coast of North America from Newfoundland to South Carolina. In the British Isles from England, Scotland, Ireland, the Channel Isles (Maggs and Hommersand, 1993).

Ireland: not recorded from Northern Ireland (Morton, 1994).

The only record from Donegal is undetailed in Maggs and Hommersand (1993).

***Polysiphonia lanosa* (Linnaeus) Tandy**

synonym *Polysiphonia fastigiata* (Roth) Greville

This is the most common species of *Polysiphonia*, epiphytic on *Ascophyllum nodosum* and almost always to be found wherever *A. nodosum* occurs. Rarely epiphytic on *Fucus*.

N. Atlantic: Spain to Norway, Iceland, Greenland and North America (South and Tittley, 1986). Common and readily identified and well recorded, however there are no records of it in Co. Donegal in Norton (1985).

Ireland: very common except on expopsed shores.

Gweebarra B. - Rossbeg 2000 coll. OM; Inishkeel 2000 coll. OM\ Dunglow B. - near Terman 1996 coll. McC det. CAM (TCD: A1276)\ Tory I. - *circa* 1845 coll. GCH? (Hyndman, 1853)\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11255)\ Mulroy B. - Scoltnamaddy; Portnalong; near Bunlin B. & Millford Port 1952/55 (Parkes, 1958a & 1958b); Gola More 1997 coll. & det. OM\ Fanad - E. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11366)\ Inishtrahull 2000 coll. JN det. OM\ Inishowen - Esky B. 1998 coll. OM\ L. Foyle - Moville coll. WS (BEL: F7333); Whitecastle to Greencastle 1937/39 (Blackler, 1951). The records in Sawers (1854) may be from L. Swilly or Foyle.

***Polysiphonia nigra* (Hudson) Batters**

Epilithic in rock pools of the lower littoral and the sublittoral, generally distributed around the British Isles.

N. Atlantic: Portugal to Norway and including the Shetlands (South and Tittley, 1986).

Ireland: uncommon but probably under-recorded.

Dunglow B. - Rutland South Channel 1996 coll. EMS det. CAM (TCD: A1215); Wyon Pt 1996 coll. EMS det. CAM (TCD: A1189); Inishkeeragh 1996 coll. & det. CSE (TCD: A1216)\ Mulroy B. 1952/55 (Parkes, 1958b); Bar Rocks 1993 coll. CSE det. CAM (TCD: A554)\ L. Swilly - Buncrana 1854 coll. WS (BEL: F7334).

***Polysiphonia simulans* Harvey**

In pools at low-water.

N. Atlantic: France, England and Ireland (South and Tittley, 1986). Maggs and Hommersand (1993) note that records outside the British Isles and the Channel Isles appear to be misidentifications.

Ireland: rare, only one record from Co. Donegal, there are none from Northern Ireland (Morton, 1994). Maggs and Hommersand's comment throws doubt on this single record.

Mulroy B. 1952/55 (Parkes, 1958b).

***Polysiphonia stricta* (Dillwyn) Greville**

synonym *Polysiphonia urceolata* (Lightfoot ex Dillwyn) Greville

synonym *Polysiphonia spiralis* L. Batten

Epiphytic and epizoic from low-water in the sublittoral. Generally distributed around the British Isles.

N. Atlantic: Spain to the British Isles, Faroës and Iceland, on the Atlantic shores of North America from New Jersey to Canada and Greenland (South and Tittley, 1986).

Ireland: common.

Donegal B. - Murles Pt 1978 coll. MdeV (BEL: F1815); near St John's Pt 1999 coll. OM det. CAM (BEL: F11810); Portnagh Rock 1996 coll. EMS det. CAM (TCD: A1158); Fintragh B. 1999 coll. & det. OM conf. CAM (BEL: F11833 & F11842)\ Rathlin O'Birne 1996 coll. EMS det. CAM (TCD: A1242)\ Gweebarra B. - Portnoo 2000 coll. & det. OM (BEL: F11910)\ Dunglow B. - Illancrone I. 1997 coll. PT det. CAM (TCD: A1170)\ Inishfree B. - Magheragallon 1995 coll. & det. OM (BEL: F11192); Bricklack 1996 coll. McC det. CAM (TCD: A1275)\ Limeburners Rock 1993 coll. EMS det. CAM (TCD: A552)\ Mulroy B. 1952/55 (Parkes, 1958b)\ Fanad - Fanad Hd 1989 coll. & det. CAM (UCG: 009123; Kim *et al.*, 2000)\ Inishtrahull 2000 coll. JN det. OM not confirmed (BEL: F11939)\ Inishowen - Carrickbraghy 1996 coll. McC det. CAM (TCD: A1323; A1257)\ L. Foyle - Greencastle 1853 coll. WS (BEL: F7344); Moville 1853 coll. WS (BEL: F7345) & 1937/39 (Blackler, 1951).

***Polysiphonia subulifera* (C. Agardh) Harvey**

Epiphytic in the very low-littoral into the sublittoral to 20m.

N. Atlantic: Northern France to the British Isles (South and Tittley, 1986).

Ireland: only one record from Co. Donegal, however it may be more widespread. There are only a few old records of it from Northern Ireland (Morton, 1994). Very rare.

L. Foyle - Dredged North Deep 1937/39 (Blackler, 1951).

***Pterosiphonia parasitica* (Hudson) Falkenberg**

Epilithic and epiphytic in deep low-water pools and the sublittoral. Generally distributed around the British Isles.

N. Atlantic: Azores to Norway and Iceland (South and Tittley, 1986; Maggs and Hommersand, 1993).

Ireland: fairly common in the sublittoral Co. Donegal and common in Northern Ireland (Morton, 1994).

Donegal B. - Murles Pt 1994 coll. & det. MDG (UCG: 008894); St John's Pt sublittoral 1982 coll. BEP det. CMH (BEL: F4564); Bullockmore, St John's Pt 1984 coll. CMH (BEL: F5055); S. of Doorin Pt 1994 (*BioMar*)\ Rathlin O'Birne 1980 coll. & det. CAM (UCG: 007295; Maggs and Guiry, 1982b)\ Dunglow B. - Toninishgun Pt 1996 coll. BEP det. MDG (TCD: A1047)\ Tory I. - SW of Carrickadda 1995 coll. & det. EMS (TCD: A367)\ Rosguill - Outer Claddaghanillian B. 1993 coll. & det. EMS (TCD: A78)\ Mulroy B. - Knox's Hole 1993 (*BioMar*)\ L. Swilly 1853 coll. WS (BEL: F7357; Sawers, 1854).

***Rhodomela confervoides* (Hudson) P. C. Silva**

Usually epiphytic in low-water rock pools and the sublittoral to 27m, generally distributed around the British Isles (Maggs and Hommersand, 1993).

N. Atlantic: Spain to Spitzbergen and in North America from Canada to New Jersey and Greenland (South and Tittley, 1986) and generally around the British Isles (Maggs and Hommersand, 1993).

Ireland: common in Ireland (Guiry, 1978; Morton, 1994).

Donegal B. - Bundoran 1857 collector unknown (BEL: F1421); Bunatrahan 2002 coll. & det. OM (BEL: F11975); Murles Pt 1994 coll. & det. MDG (UCG: 008888); Kiln Port 1999 coll. OM; St John's Pt 1976 coll. MdeV det. MDG (UCG: 007429)\ Sheephaven B. - Downies 1944 coll. & det. MdeV (UCG: 007446)\ Mulroy B. - Ballyhoorisky 1944 coll. & det. MdeV (UCG: 007445); opposite Carrowkeel 1990 coll. & det. CAM (UCG: 009107)\ L. Swilly - Anny Pt 1993 coll. BEP det. CAM (TCD: A558)\ L. Foyle - Moville 1850s coll. WS (BEL:

F7392); Clare and N. Moville 1937/39 (Blackler, 1951).

***Rhodomela lycopodioides* (Linnaeus) C. Agardh**

Generally epiphytic on *Laminaria* in the lower littoral rock pools and the sublittoral. (Maggs and Hommersand, 1993).

N. Atlantic: British Isles to Norway and Iceland, Greenland, and Arctic Canada (South and Tittley, 1986). A northern species.

Ireland: rare. Few recent records from Northern Ireland (Morton, 1994).

Donegal B. - Bundoran 1840 coll. GCH (BEL: F2684)\ Gweebarra B. - Portnoo 2000 coll. & det. OM (BEL: F11901)\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11277)\ Inishowen - Pollan B. 1943 coll. & det. MdeV (UCG: 007453); near Malin (Norton, 1985). The records in Sawers (1854) may be from L. Swilly or Foyle.

Chlorophyta

Chlorophyceae

Chloroccales

Endosphaeraceae

***Gomontia polyrhiza* (Lagerheim) Bornet et Flahault**

The sporophyte is unicellular and morphologically indistinguishable from similar phases in the life history of *Monostroma grevillei* (Thuret) Wittrock and *Eugomontia sacculata* Kornmann. The gametophyte is a microscopic disc. The confirmed distribution of the species can only include those localities from which the sporophytes have been cultured to give rise to gametophytes. Found in mollusc shells in both the littoral and sublittoral (Burrows, 1991).

N. Atlantic: Portugal to the Faroës, Greenland, Canada and the U.S.A. (South and Tittley, 1986). Likely to be common in Britain (Burrows, 1991). Further research is required on this species.

Ireland: very rare.

L. Foyle - Moville on barnacles 1937/39 (Blackler, 1951).

Chaetophorales

Chaetophoraceae

***Pringsheimiella scutata* (Reinke) Hoechnel ex Marchewianka**

Occuring as a small epiphytic discs up to 2mm diameter on algae of the lower littoral and sublittoral.

N. Atlantic: Spain to the British Isles, Norway, Iceland and Greenland. In North America from Canada to Connecticut (South and Tittley, 1986).

Ireland: very rare. Recorded in Northern Ireland by the *NILS*. Probably not uncommon.

L. Foyle - Greencastle epiphytic on *Polysiphonia fastigiata* 1937/39 (Blackler, 1951).

Ulvales

Monostromataceae

***Monostroma obscurum* (Kützing) J. Agardh**

A thin foliose lamina up to 10cm in length which splits into segments. Included in South and Tittley (1986) as *Ulvaria obscura* (Kützing) Gayral.

N. Atlantic: Spain to France, the British Isles, Norway, Iceland, Spitzbergen, the Faroës and Greenland. North America from Canada to New Jersey (South and Tittley, 1986).

Ireland: very rare, only one record.

Mulroy B. 1952/55 (Parkes, 1958b).

Ulvaceae

***Blidingia* Kylin**

Three species are included in Burrows (1991) and in Guiry (1997). *B. marginata* var. *subsala* (Kjellman) Bliding, was raised to a subspecies by Burrows, who noted that it was possibly only a "habitat modification" (Burrows, 1991).

***Blidingia marginata* (J. Agardh) P. Dangeard**

Small, 1-5cm long with tubular branched thalli.

N. Atlantic: Europe from Spain to Spitzbergen, Greenland and around the British Isles. North America from Canada to Virginia (South and Tittley, 1986).

Ireland: Guiry (1978) noted only one reference to this species - from Wexford. It has been recorded about a dozen times in Northern Ireland (Morton, 1994). Very rare but may possibly

have been passed unnoticed.

L. Foyle - Moville 1937/39 (Blackler, 1951).

***Enteromorpha* Link**

Burrows (1991) described seven species from the British Isles. She united *E. intestinalis* and *E. compressa* as two subspecies in the one species. Guiry (1997) separated them and added *E. intestinaloides* Koeman et van den Hoek (in the southern North Sea). He united *E. crinita* and *E. ramulosa* in *E. muscoides*. The different species are all similar and tubular of varying lengths, generally branched to some degree. Microscopical examination is often required for identification.

***Enteromorpha compressa* (Linnaeus) Nees**

Listed by Burrows (1991) as a subspecies: *E. intestinalis* subsp. *compressa*.

N. Atlantic: European shores from the Azores to Spitsbergen, Iceland and Greenland. North America from Canada to Virginia (South and Tittley, 1986).

Ireland: abundant.

Donegal B. - Bunatrahan 2002 coll. & det. OM as *E. intestinalis* subsp. *compressa* (BEL: F11972)\ Inishowen - Carrickabraghy 1996 coll. McC det. MAG (TCD: A890 & A891); Bulbinbeg 1978 coll. OM det. JB (BEL: F11647) & Dunagree Pt 1998 coll. OM det. JB (BEL: F11672)\ L. Foyle - Moville 1937/39 (Blackler, 1951: as *E. compressa*).

***Enteromorpha intestinalis* agg.**

Burrows (1991) considered this taxon to consist of two subspecies: *intestinalis* and *compressa*. Recent research has indicated that they are two genetically distinct species (Blomster *et al.*, 1998). The older references, and some more recent records, however, do not determine the subspecies and the records can only be given here as an aggregate.

Donegal B. - Fintragh B. 1999 coll. & det. OM; St John's Pt 1999 coll. & det. OM (BEL: F11826)\ Gweebarra B. - Portnoo 2000 coll. & det. OM (BEL: F11912)\ Mulroy B. - between stations Drumnacraig & Invermore B. also E. of Ballyhoorisky Pt at the entrance of Mulroy B. 1952/55 (Parkes, 1958a)\ Inishtrahull 2000 coll. JN det. OM (BEL: F11940).

***Enteromorpha intestinalis* (Linnaeus) Nees**

Considered by Burrows (1991) as a subspecies: *E. intestinalis* subsp. *intestinalis*.

N. Atlantic: Azores along the shores of Europe to Iceland and Greenland. North America from

Canada to Maryland (South and Tittley, 1986).

Ireland: abundant.

Donegal B. - Bunatrahan 2002 coll. & det. OM (BEL: F11966); Doorin Pt 2002 coll. OM\ Gweebarra B. - Inishkeel 2000 coll. & det. OM\ Sheephaven B. - The Caskins 1996 coll. OM det. JB (BEL: F11259)\ Inishowen - Dunagree Pt 1988 coll. & det. OM (BEL: F11672)\ L. Foyle - Moville very abundant - "Occurs all along the Lough" 1937/39 (Blackler, 1951: as *E. intestinalis*).

***Enteromorpha linza* (Linnaeus) J. Agardh**

One of the unbranched species of *Enteromorpha*.

N. Atlantic: Azores along the European shores to Iceland and in North America from Canada to Virginia (South and Tittley, 1986).

Ireland: abundant.

Donegal B. - Bundoran 1857 [coll Brenan] (BEL: F1391)\ Mulroy B. 1952/55 (Parkes, 1958b)\ Inishowen - Carrickabraghy 1996 coll. McC det. CAM (TCD: A1277); Dunagree B. 1998 coll. OM det. JB (BEL: F11672)\ L. Foyle - Greencastle; Moville; Drung to Whitecastle 1937/39 (Blackler, 1951: as *Ulva linza*).

***Enteromorpha muscoides* (Clemente) Cremades**

synonym *Enteromorpha clathrata* (Roth) Greville

synonym *Enteromorpha crinita* Nees

synonym *Enteromorpha ramulosa* (J. E. Smith) Carmichael

Enteromorpha muscoides is not included in Burrows (1991) but is listed as a separate species in Hardy and Guiry (2003). Generally distributed around the British Isles. Tufts with branched thalli to 15cm long and with different morphological forms (Burrows, 1991).

N. Atlantic: Europe from the Azores to the Shetlands, Iceland and Greenland. In North America from Canada (South and Tittley, 1986) to the Caribbean (Burrows, 1991).

Ireland: recorded from several counties (Guiry, 1978) and on a number of occasions in Northern Ireland (Morton, 1994), probably not uncommon.

Inishfree B. - Gweedore B. 1995 coll. OM det. JB (BEL: F11196)\ Mulroy B. - Gola More 1997 coll. OM det. JB (BEL: F11376)\ Fanad - Doagh Beg 1997 coll. & det. JB (BEL: F11686!)\ L. Foyle - Moville and Ravenscliffe Reef 1937/39 (Blackler, 1951: as *E. ramulosa*

var. *robusta*).

***Enteromorpha ralfsii* Harvey**

Thallus of tangled threads, occasionally branching. There are few records of this alga from the British Isles and it may have been overlooked (Burrows, 1991).

N. Atlantic: Spain, around the British Isles to Norway and Canada (South and Tittley, 1986).

Ireland: Guiry (1978) notes references from Cork and Donegal and there are one or two from Northern Ireland (Morton, 1994). Very rare, only one record from Co. Donegal.

Mulroy B. 1952/55 (Parkes, 1958b).

***Ulva* Linnaeus**

In Burrows (1991), only three species of *Ulva* are recorded from the British Isles. Koeman and van den Hoek (1980), however, recognise five species and note that the "diversity in *Ulva* is still being underestimated for British and Irish shores". Hardy and Guiry (2003) list two species from the British Isles. It is quite probable that this genus is under-represented.

***Ulva lactuca* Linnaeus**

vernacular name Sea lettuce

One of the most common green alga on the shore.

N. Atlantic: on almost all shores of the North Atlantic (South and Tittley, 1986).

Ireland: very common, however, some of these records may be of other species noted in Koeman (1980) and worthy of confirmation.

Donegal B. - Fintragh B. 1999 coll. & det. OM (BEL: F11839); Kiln Port 1999 coll. & det. OM (BEL: F11847)\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11279)\ Mulroy B. 1952/55 (Parkes, 1958b)\ L. Swilly - N. Ballymastocker B. 1997 coll. & det. OM (BEL: F11373)\ Inishtrahull 2000 coll. JN det. OM (BEL: F11941)\ Inishowen - Bulbinbeg 1998 coll. & det. OM (BEL: F11646)\ L. Foyle - Greencastle to Culmore 1937/39 (Blackler, 1951).

***Ulva rigida* C. Agardh**

Very similar to *U. lactuca* but distinguishable by microscopic "teeth" at the base part of the thallus.

N. Atlantic: most shores of the north Atlantic - European and American (South and Tittley, 1986).

Ireland: very rare.

Donegal B. – Fintragh B. 1999 coll. & det. OM (BEL: F11838); Rolagh 1980 coll. EM det. MDG (UCG: 008032)\ Gweebarra B. – Inishkeel 2000 coll. & det. OM (BEL: 11929)\ Inishfree B. – Magheragallon 1995 coll. & det. OM (BEL: F11197).

Prasiolales

Prasiolaceae

***Prasiola* (C. Agardh) Meneghini**

There are four species in the British Isles, only one of which has been recorded from Co. Donegal, the other species may exist but are un-recorded. All are very similar.

***Prasiola stipitata* Suhr ex Jessen**

Growing as small tufts no more than 1cm high just above the upper littoral, or in the upper littoral zone, where it may be overlooked and unrecorded. Erratic in its distribution and associated with sea bird droppings. South and Tittley (1986) consider *P. stipitata* and *P. furfuraceae* to be the one species. Both have been recorded in Northern Ireland (Morton, 1994).

N. Atlantic: France, the British Isles, Iceland and Greenland. On the Atlantic coast of North America from Canada to Massachusetts (South and Tittley, 1986).

Ireland: Norton (1986) shows it to be fairly widespread in Britain and well recorded in the south-east of England but with only a few records for all of Ireland and none from Co. Donegal.

L. Foyle – Moville to Greencastle; Saltpans Rock; Redcastle; Drung to Whitecastle 1937/39 (Blackler, 1951).

Acrosiphoniales

Acrosiphoniaceae

***Acrosiphonia arcta* (Dillwyn) Gain**

synonym *Spongomorpha arcta* (Dillwyn) Kützing

Very similar to *S. aeruginosa*.

N. Atlantic: Azores, Spain, France, England, Wales and Norway. In America from Canada to Virginia (South and Tittley, 1986). Generally common on the coasts of the British Isles

(Burrows, 1991).

Ireland: Cork, Waterford and Donegal (Guiry, 1978), recorded as common in Northern Ireland (Morton, 1994) and may be common in Donegal.

Donegal B. – Murles Pt 1994 coll. & det. MDG (UCG: 008893); Rolagh 1980 coll. EM det. MDG (UCG: 007830)\ L. Foyle – Moville 1937/39 (Blackler, 1951).

***Spongomorpha aeruginosa* (Linnaeus) Hoek**

Branched uniseriate filaments no more than 3-4cm long. Littoral and sub-littoral, epiphytic. There are two similar species. *Chlorochytrium inclusum* is now known to be a stage in the life history of *S. aeruginosa* (Burrows, 1991: p. 30).

N. Atlantic: Europe from Spain to the Faroës, Iceland and Greenland. On the Atlantic shores of America from Canada to Connecticut (South and Tittley, 1986).

Ireland: probably fairly common and under-recorded.

Mulroy B. – between Ballyhoorisky Pt & Sladdannavooghog 1952/55 (Parkes, 1958: as *S. lanosa*)\ L. Foyle – Greencastle; Moville; Ravenscliffe Reef 1937/39 (Blackler, 1951: as *S. lanosa*).

***Urospora penicilliformis* (Roth) Areschoug**

Similar to *Ulothrix*, in the upper littoral.

N. Atlantic: Europe from Spain to Iceland, Greenland and around the British Isles, also in North America from Canada to Virginia (South and Tittley, 1986).

Ireland: Cos Cork, Kerry, Clare, and Galway (Guiry, 1978). Few records from Co. Donegal. Probably common.

L. Foyle – Moville "In *Bangia* community" Glenbyrnie to Ravenscliffe Reef as *U. isogona* 1937/39 (Blackler, 1951).

Cladophorales

Cladophoraceae

***Chaetomorpha* Kützing**

Hardy and Guiry (2003) list five species from the British Isles, but comment that a complete revision is required. All are simple filaments, each of a single row of unbranched cells. A complete reappraisal of this genus is necessary.

***Chaetomorpha linum* (O. F. Müller) Kützing**

Some records of *C. aerea* and *C. mediterranea*, previously considered synonyms, are now considered separe species (*C. aerea* and *Rhizoclonium tortuosum*, a synonym of *C. mediterranea*) in Hardy and Guiry (2003) may be included below.

N. Atlantic: Azores to the British Isles and Norway on the European coasts. In North America from Virginia to Canada (South and Tittley, 1986).

Ireland: widespread. Indicated to have been recorded from about eight counties in Guiry (1978). Common in Northern Ireland (Morton, 1994).

Donegal B. – Murles Pt 1994 coll. & det. MDG (UCG: 008915); Fintragh B. 1999 coll. & det. OM (BEL: F11843)\ Gweebarra B. – Inishkeel 2000 coll. & det. OM (BEL: F11927)\ Inishfree B. – Magheragallon 1995 coll. & det. OM (BEL: F11204)\ Inishbofin – Meenclady 1996 coll. McC det. MDG (TCD: A857)\ Mulroy B. – Tranafaighaboy or Gortnalughoge 1952/55 (Parkes, 1958a: as *C. ? aera*)\ Inishowen – Carrickabraghy 1996 coll. McC det. CAM (TCD: A1306; A1274).

***Chaetomorpha melagonium* (F. Weber et D. Mohr) Kützing**

Filaments straight and attached, dark green, outline of filament clearly shows a constriction between the cells.

N. Atlantic: recorded from Spain to the British Isles and to Norway, Spitzbergen, the Faroës, Iceland, Greenland and the Atlantic coast of North America (South and Tittley, 1986). Burrows (1991) includes both attached and unattached forms in this species.

Ireland: only one record.

Inishowen – Bulbinbeg 1998 coll. & det. OM (BEL: F11644).

***Cladophora* Kützing**

A large genus with 18 species from the British Isles listed in Hardy and Guiry (2003) and 17 in Burrows (1991), not easily distinguished. Van den Hoek (1963) gives a detailed revision of all species and notes that the marine species are distributed largely in the southern and temperate regions. Some species are common in rock pools of the littoral. All uniseriate branched filaments. Probably most are under-recorded.

***Cladophora albida* (Nees) Kützing**

A common species of the littoral, 5–15cm long (Burrows, 1991).

N. Atlantic: Spain north to the British Isles and on the Atlantic coasts of North America from Canada to Florida (South and Tittley, 1986).

Ireland: common and under-recorded.

L. Foyle - Clare 1937/39 (Blackler, 1951).

***Cladophora hutchinsiae* (Dillwyn) Kützing**

Littoral and sublittoral up to 35cm long.

N. Atlantic: Spain to the British Isles (South and Tittley, 1986).

Ireland: the distribution is very uncertain (Burrows, 1991; Cullinane, 1973).

L. Foyle - Moville 1937/39 (Blackler, 1951).

***Cladophora laetevirens* (Dillwyn) Kützing**

Epilithic in rock pools in the littoral and and upper sublittoral, up to 20cm long (Burrows, 1991).

N. Atlantic: Spain north to the British Isles (South and Tittley, 1986) where it is widely distributed (Burrows, 1991).

Ireland: only five records from Northern Ireland (Morton, 1994).

Donegal B. - Bundoran collector unknown (BEL: F2674; F7835; F8606).

***Cladophora lehmanniana* (Lindenberg) Kützing**

synonym *Cladophora macallana* Harvey

A branched thallus up to 9cm in length (Burrows, 1991). Littoral and sublittoral (van den Hoek, 1963).

N. Atlantic: Spain to England and Ireland (South and Tittley, 1986).

Ireland: rarely recorded. However, this may be due to confusion with other species (Burrows, 1991). Only one record from Northern Ireland (Morton, 1994).

L. Foyle - Greencastle & Whitecastle to Drung 1937/39 (Blackler, 1951: as *C. utriculosa* Kütz.).

***Cladophora pygmaea* Reinke**

Very small branched thallus growing to less than 2mm long. Mainly sublittoral to a depth of 30m or more (Burrows, 1991).

N. Atlantic: France, southern North Sea, west Baltic, Ireland, the Shetlands and the Atlantic coast of North America (South and Tittley, 1986).

Ireland: only one record. Three records from Northern Ireland (Morton, 1994).

Donegal B. - noted from Co. Donegal, undetailed (Burrows, 1991).

***Cladophora rupestris* (Linnaeus) Kützing**

The commonest species of *Cladophora*. Grows to 20cm high in rock pools of the littoral (Burrows, 1991). Generally epilithic.

N. Atlantic: Spain to the British Isles, the Faroës, Iceland and Greenland, also North America from Canada to Massachusetts (South and Tittley, 1986).

Ireland: common on many shores of the British Isles but not shown from Co. Donegal in Norton (1985), no doubt under-recorded.

Donegal B. - Bundoran 1891 coll. Lea (Hoek, 1963); Murles 1978 coll. MdeV (BEL: F1820) & 1994 (*BioMar*); Doorin Pt 2002 coll. OM (BEL: F11951); Rolagh 1980 coll. EM det. MDG (UCG: 003662)\ Inishfree B. - Brinlack Port 1996 coll. McC det. MDG (TCD: A859 & A881)\ Tory I. - *circa* 1845 coll. GCH? (Hyndman, 1853 also BEL: F2666 not detailed)\ Sheephaven B. - Meenclady B. 1996 two specimens both coll. McC det. MDG (TCD: A897) & det. CAM (TCD: A1298); Downies 1886 coll. JM (BEL: F3423)\ Fanad - W. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11327)\ Mulroy B. - 1952/55 (Parkes, 1958b); Gortnatraw B. 1993 coll. CSE det. MDG (TCD: A52); Mark's Pt; Ballyhoorisky Pt 1993 (*BioMar*)\ L. Foyle - Greencastle to Culmore 1937/39 (Blackler, 1951).

***Cladophora sericea* (Hudson) Kützing**

A well branched species growing to 25cm high, epilithic in the littoral. Common but few records shown in Norton (1985), noted as common in Northern Ireland in Morton (1994).

N. Atlantic: Spain to the British Isles, Iceland and Greenland. North America from Canada to New Jersey (South and Tittley, 1986).

Ireland: few old records.

Donegal B. - Bundoran 1846 coll. WHH? (BEL: F10362)\ L. Foyle - Greencastle & off Redcastle (dredged) 1937/39 (Blackler, 1951).

***Rhizoclonium tortuosum* (Dillwyn) Kützing**

Although Burrows (1991) considered *R. tortuosum* and *R. riparium* to be conspecific, this has not been generally accepted (Guiry, 1997). Very similar to unattached plants of *Chaetomorpha*.

N. Atlantic: generally North Atlantic (South and Tittley, 1986) and probably world-wide

(Burrows, 1991).

Ireland: few records.

Mulroy B. 1952/55 (Parkes, 1958b)\ L. Foyle - Bathouse rocks & Ravenscliffe Reef, Moville; Saltpans to Clare 1937/39 (Blackler, 1951).

Bryopsidales

Bryopsisaceae

This genus can easily be distinguished from other algae, however the two species cannot always be easily distinguished from each other.

***Bryopsis* sp.**

Fanad - W. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11337; F11338).

***Bryopsis hypnoides* J. V. Lamouroux**

Branches not in two opposite rows. Epilithic and littoral and sublittoral, in deep shaded rock pools at low water.

N. Atlantic: both sides of the north Atlantic but no further north than the Shetlands and the Maritime Provinces of Canada (South and Tittley, 1986).

Ireland: occasional.

Donegal B. - Bundoran [coll Brenan] det. OM (BEL: F2515)\ L. Foyle - Moville; Redcastle & Maiden Rocks to Drung 1937/39 (Blackler, 1951).

***Bryopsis plumosa* (Hudson) C. Agardh**

Branches in two opposite rows. Generally distributed around the British Isles in places common but never abundant. Epilithic and littoral and sublittoral, in deep shaded rock pools at low water.

N. Atlantic: both sides of the north Atlantic as far north as Iceland and in North America from Newfoundland to Virginia (South and Tittley, 1986).

Ireland: occasional.

Donegal B. - Bundoran collector unknown (BEL: F1381)\ Rathlin O'Birne 1983 coll. CMH (BEL: F4655)\ Tory I. - Marnid Pt 1995 coll. & det. CSE (TCD: A354)\ Mulroy B. - Mark's Pt (2) 1993 (*BioMar*)\ L. Swilly - Stuaker B. 1853 coll. WS (McMillan and Morton, 1979; BEL: F1546)\ L. Foyle - Redcastle; Maiden Rocks & Drung 1937/39 (Blackler, 1951).

Codiacaea

***Codium adhaerens* C. Agardh**

Growing in as a felt on the rocks, irregular in shape. Epilithic in the low-littoral and sublittoral.

N. Atlantic: Azores, Spain, France and England and Ireland (South and Tittley, 1986).

Ireland: first recorded in Ireland in 1834 on Rathlin Island, Co. Antrim by D. Moore (Harvey, 1871). Very rare.

Tory I. - 1845 coll. GCH det. Silva 1955 (TCD), this single record is repeated in other references.

***Codium bursa* (Linnaeus) C. Agardh**

Grows as a sphere up to 30cm across. Epilithic and sublittoral.

N. Atlantic: Europe from the Azores to England and Ireland, no records further north or outside Europe (South and Tittley, 1986).

Ireland: very rare.

Mulroy B. - Kindrum 1977 coll. Bustard & Kelly det. OM (BEL: F1189 - F1190; Morton, 1978; Burrows, 1991); Lagmore B. 1988 noted & det. JN.

***Codium fragile* (Suringar) Hariot**

Two subspecies: *atlanticum* and *tomentosoides*. In a some references and records, the subspecies has not been noted and the records can only be given here at specific level. The species has an extensive geographic distribution being recorded from all continents (Silva, 1955). Originally described from Japan (Goff *et al.*, 1992), both subspecies were probably introduced from the Pacific and are now outcompeting *C. tomentosum* (Farnham, 1980). Before Cotton (1912), this species, *C. fragile*, had not been distinguished from *C. tomentosum*. It is not included in Harvey's *Phycologia Britannica* (1871).

Donegal B. - Murles Pt 1994 (*BioMar*); Doorin Pt 1989 (Foster and Dring, 1994)\ Inishowen - Carrickabraghy 1966 coll. McC det. MDG (TCD: A886).

***Codium fragile* (Suringar) Hariot subsp. *atlanticum* (Cotton) P. Silva**

synonym *Codium mucronatum* Cotton

Dark green dichotomously branched up to 40cm long. Possibly introduced from the Pacific in historical times and collected in Bantry Bay by Miss Hutchins (*circa* 1808) (Silva, 1955). The

more common of the two subspecies and the most common *Codium* in Ireland. Epilithic, midlittoral and sublittoral.

N. Atlantic: British Isles to Norway and not found outside Europe (Burrows, 1991; South and Tittley, 1986).

Ireland: very common and in places abundant.

Donegal B. - Bundoran 1850 coll. WHH (Cotton, 1912; Silva, 1955); Murles 1978 coll. MdeV (BEL: F1829)\ Inishfree B. - Rinagerragh Pt 1967 coll. & det. OM det. HMP (BEL: F3044; Parkes, 1975)\ Tory I. 1845 coll. GCH det. HMP (BEL: F79)\ Sheephaven B. - Downing's B. 1886 coll. JM det. HMP (BEL: F82)\ Mulroy B. - at several stations 1952/55 (Parkes, 1958b); Gortnalughoge; Invermore B.; Ballyhoorisky Pt 1952 (Parkes, 1975)\ Inishowen - Malin Hd 1863 coll. JM det. HMP (BEL: F83); Esky B. 1998 coll. & det. OM (BEL: F11658)\ L. Foyle - Greencastle; Ravenscliffe Reef; Drung; Whitecastle 1937/39 (Blackler, 1951).

***Codium fragile* (Suringar) Hariot subsp. *tomentosoides* (van Goor) P. C. Silva**

This invasive subspecies seems to be a recent addition to the flora of Europe and was first collected in Holland in 1900 and in Britain in the 1939, probably originating from Japan (Silva, 1955). It colonised the North Sea and spread into the Mediterranean Sea, the Atlantic and Pacific coasts of the United States (Goff *et al.*, 1992). It is spreading rapidly (Parkes, 1975) and is abundant in the pools of the midlittoral in some sheltered sites (at Rossbeg 2000, OM). Its success may be due to its rapid reproduction, principally by parthenogenesis (Goff *et al.*, 1992). Epilithic, littoral and sublittoral.

N. Atlantic: much wider distribution than *C. fragile* subsp. *atlanticum*. West coast of Europe from France to Iceland including England, Ireland and Wales. On east coast of America from Maine to New Jersey and Virginia (South and Tittley, 1986).

Ireland: generally widespread around Ireland, however no records from Cos Down or Londonderry in Morton (1994).

Donegal B. - Bundoran 1975 coll. & det. OM (BEL: F106); Doorin Pt 2002 coll. OM; St John's Pt 1972 coll. MdeV (Parkes, 1975) & 1999 coll. & det. OM (BEL: F11823); Rolagh, Kilcar 1980 coll. EM det. MDG (UCG: 003801)\ Gweebarra B. - N. of Glencolumbkille (drift) 1970 coll. Scannell (Parkes, 1975); Rossbeg 2000 coll. & det. OM (BEL: F11916); Inishkeel

2000 coll. OM\ Inishfree B. - Magheragallon 1995 coll. & det. OM (BEL: F11203; F11212)\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11276)\ Mulroy B. - Gola More 1997 coll. & det. OM (BEL: F11275)\ Fanad - E. & W. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11342).

***Codium tomentosum* Stackhouse**

A dichotomously branched species similar to *C. fragile*. There is evidence that it is dying out on the coasts of the British Isles (Burrows, 1991). Epilithic, littoral and sublittoral.

N. Atlantic: Azores, Portugal to England, Ireland and the Netherlands (South and Tittley, 1986; Burrows, 1991).

Ireland: recorded from most maritime counties. Common.

Donegal B. - Bundoran 1840 coll. GCH det. HMP (BEL: F80) & 1894 coll. Johnson (Parkes, 1975)\ Gweebarra B. - Portnoo 1942 coll. HMP (Parkes, 1975); Go I. 1896 (Parkes, 1975); Gola I. (undated) coll. Johnson (Parkes, 1975)\ Tory I. - *circa* 1845 coll. poss GCH det. HMP (Hyndman, 1853; BEL: F78); 1952 coll. O'Sullivan (Parkes, 1975)\ Mulroy B. - 1952/55 (Parkes, 1958b); Sladdannavooghog 1953 coll. HMP (Parkes, 1975); Scoltnamaddy 1952 coll. HMP (Parkes, 1975)\ Inishowen - Malin Hd 1897 (Silva, 1955); Esky B. & Bulbinbeg 1998 coll. & det. OM (BEL: F11629)\ L. Foyle - Moville 1937/39 (Blackler, 1951; Parkes, 1975); Drung to Whitecastle 1937 coll. Blackler (Parkes, 1975).

Ulotrichales

Ulotrichaceae

***Ulothrix* Kützing**

Hardy and Guiry (2003) list four species of this genus from the British Isles. The differences between *Urospora* and *Ulothrix* are microscopic. Probably the species of both genera are under-recorded.

***Ulothrix flacca* (Dillwyn) Thuret**

Unbranched filaments forming woolly clumps in the littoral. Common all around the British Isles (Burrows, 1991).

N. Atlantic: Atlantic coast of Europe from Azores to Iceland and Greenland. In North America from Canada to Delaware (South and Tittley, 1986).

Ireland: common in Northern Ireland (Morton, 1994). However, only one record from Co. Donegal, no doubt much under-recorded.

Donegal B. - Doorin Pt 2002 coll. OM (BEL: F11957)\ L. Foyle - Moville on *Desmarestia aculeata* 1937/39 (Blackler, 1951).

***Ulothrix speciosa* (Carmichael) Kützing**

Probably common and confused with other species throughout the littoral.

N. Atlantic: widely distributed in the British Isles (Burrows, 1991), France northwards along the European coasts to Greenland. In North America from Canada to New Hampshire (South and Tittley, 1986).

Ireland: common in Northern Ireland but poorly recorded in Co. Donegal. Probably vastly under-recorded.

L. Foyle - Greencastle on *Corallina officinalis* 1937/39 (Blackler, 1951).

Heterokontophyta

(Phaeophyta)

Phaeophyceae

Sphacelariales

Sphacelariaceae

***Cladostephus spongiosus* (Hudson) C. Agardh**

Cladostephus verticillatus was treated as a separate species in Parke and Dixon (1968) but later reduced to two formae (Parke and Dixon, 1976). Those records which have been identified down to form are listed separately here. Abundant and widespread in rock pools of the littoral and sublittoral. The two formae can be distinguised by the whorls of ramuli which are very close together and difficulate to distinguish in *spongiosus* and close, but distinct, in *verticilatus*.

N. Atlantic: Azores, along the coast of Europe to Iceland and on the Atlantic shores of North America (South and Tittley, 1986).

Ireland: common.

Donegal B. - Doorin Pt 2002 coll. OM\ Dunglow B. - Wyon Pt 1996 coll. & det. EMS (TCD: A1207); NE Terman 1996 coll. McC det. CAM (TCD: A1283)\ Inishbofin B. -

Meenclady B. 1996 coll. McC det. CAM (TCD: A1321)\ Mulroy B. - Ballyhoorisky Pt 1993 (*BioMar*)\ Inishowen - Dunagree Pt 1998 coll. & det. OM.

Cladostephus spongiosus* (Hudson) C. Agardh f. *spongiosus

Gweebarra B. - Inishkeel 2000 coll. & det. OM (BEL: F11924)\ Inishfree B. - near Magheragallon in Gweedore B. 1995 coll. & det. OM (BEL: F11206)\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11278)\ Mulroy B. - 1952/55 (Parkes, 1958b)\ Fanad - W. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11328)\ L. Swilly - Portnagarribane 1993 coll. & det. CSE (TCD: A50)\ Inishowen - Greencastle 1856 coll. WS det. OM (BEL: F7543; F3325)\ L. Foyle - Greencastle to Whitecastle 1937/39 (Blackler, 1951).

***Cladostephus spongiosus* (Hudson) C. Agardh f. *verticillatus* (Lightfoot) Prud'homme van Reine**

Mulroy B. - 1952/55 (Parkes, 1958b)\ Greencastle, dredged off Roe Bridge 1937/39 (Blackler, 1951).

***Sphacelaria* Lyngbye**

Hardy and Guiry (2003) list 12 species of *Sphacelaria* in the British Isles. The different species are not easy to distinguish and are probably all under-recorded. Generally tufted and densely branched, epiphytic in the littoral and sublittoral.

***Sphacelaria cirrosa* (Roth) C. Agardh**

Small tufts of of branching filaments. Low littoral to upper sublittoral.

N. Atlantic: Azores to the Shetlands and on the east coast of North America: Virginia to Canada (South and Tittley, 1986).

Ireland: no-doubt under-recorded, common in Northern Ireland (Morton, 1994).

Mulroy B. 1952/55 (as *S. pennata* (Huds.) Lyngb. var. *pennata* f. *septentrionalis* (Sauv.) Irvine) 1952/55 (Parkes, 1958b)\ L. Foyle - Greencastle 1937/39 (as *S. cirrosa*) & Clare 1937/39 (as *S. cirrosa* var. *pennata*) (Blackler, 1951).

***Sphacelaria fusca* (Hudson) S. F. Gray**

Similar to *S. cirrosa*, considered to be rather rare.

N. Atlantic: Portugal to the British Isles and on the east coast of North America (South and Tittley, 1986).

Ireland: considered rare until the *NILS* showed it to be more common and previously

overlooked (Morton, 1994).

Mulroy B. - Sladdannavooghog 1952/55 (Parkes, 1958a).

***Sphacelaria plumosa* Lyngbye**

A small (5-10cm) species with opposite branches. Sublittoral.

N. Atlantic: southern North Sea, British Isles, Spitsbergen, Iceland, Greenland. East coast of North America: Maine to Canada and Greenland (South and Tittley, 1986).

Ireland: probably overlooked.

L. Foyle - Greencastle 1852 coll. WS (BEL: F7466).

***Sphacelaria plumula* Zanardini**

A small (1-2cm) species with opposite branches. Sublittoral.

N. Atlantic: Azores to the British Isles and Canada (South and Tittley, 1986). Norton (1985) shows a few scattered sites in the British Isles and notes it as being uncommon but nevertheless under-recorded.

Ireland: Norton (1985) shows only four sites in Ireland, only one of which is in Co. Donegal. It is not recorded from Northern Ireland (Morton, 1994). Very rare.

Rathlin O'Birne I. 1980 (Maggs and Guiry, 1982b)\ L. Foyle - Greencastle, 1937/39 (Blackler, 1951).

***Halopteris filicina* (Grateloup) Kützing**

A tufted densely branched alga up to 10cm long.

N. Atlantic: Europe from the Azores to the British Isles (South and Tittley, 1986). Norton (1985) shows it to be generally a south-westerly species.

Ireland: probably not uncommon in the sublittoral but poorly recorded. Fairly well recorded by the *NISS* (Morton, 1994).

Donegal B. - Portnagh Rock sublittoral 1982 coll. BEP conf. CAM (BEL: F5312)\ Tory I. - Marnid Pt 1995 coll. & det. CSE (TCD: A349); Rinnamorreeny 1995 coll. & det. EMS (TCD: A343).

***Stypocaulon scoparia* (Linnaeus) Kützing**

synonym *Halopteris scoparia* (Linnaeus) Sauvageau

Tufted alga up to 15cm high, epilithic in the sublittoral.

N. Atlantic: Azores to the British Isles and on the coast of Canada (South and Tittley, 1986).

Ireland: generally a south-western species (Norton, 1985). Very rare.

Sheephaven B. – Downies 1944 coll. & det. MdeV (UCG: 005296)\ L. Foyle – Greencastle 1854 coll. WS (BEL: F7559); Clare, Moville & Greencastle 1937/39 (Blackler, 1951).

Dictyotales

Zonerieae

***Dictyopteris polypodioides* (A. P. de Candolle) J. V. Lamouroux**

synonym *Dictyopteris membranacea* (Stackhouse) Batters

Growing as a thin dichotomous membrane with a midrib. A south-western species (Norton, 1985) recorded from the sublittoral to depths of 25m below CD.

N. Atlantic: Azores to the British Isles (South and Tittley, 1986).

Ireland: known in Northern Ireland only from the *NISS* (Morton, 1994).

Donegal B. – Portnagh Rock 1982 coll. CMH (BEL: F5316); St John's Pt 1989 (Foster and Dring, 1994); Studdagh Rock 1996 coll. & det. EMS (TCD: A1147); Carrigan Hd 1996 coll. & det. EMS (TCD: A1011)\ Rathlin O'Birne 1980 (BEL: F4071; BM; Maggs and Guiry, 1982b)\ Dunglow B. – Arranmore I. 1944 coll. & det. MdeV (UCG: 004393; Brennan, 1945)\ Tory I. – Tormore 1995 coll. EMS det. MDG (TCD: A334); Scoltmorris 1995 coll. & det. EMS (TCD: A347)\ Rosguill – Outer Claddaghanillian B. & E. of Melmore Hd 1993 (*BioMar*).

Dictyotacea

***Dictyota dichotoma* (Hudson) J. V. Lamouroux**

Growing as a thin dichotomous membrane without a midrib. Littoral and sublittoral.

N. Atlantic: Azores to the British Isles including Shetland and from Virginia in North America (South and Tittley, 1986).

Ireland: widespread and common in lower littoral rock pools and sublittoral. First collected in Co. Donegal by Sawers in Stuaker Bay in 1853.

Donegal B. – Bundoran 1891 coll. Lea (BM); Murles Pt 1994 coll. & det. MDG (UCG: 008904); S. of Doorin Pt 1994 (*BioMar*) & Doorin Pt 2002 coll. OM; Portnagh Rock 1982 coll. BEP det. CMH (BEL: F3731); St John's Pt 1989 (Foster and Dring, 1994) & 1999 coll. & det. OM (BEL: F11820); Fintragh B. 1999 coll. & det. OM; Rolagh 1980 coll. EM det.

MDG (UCG: 004464)\ Rathlin O'Birne 1980 coll. & det. CAM (UCG: 004450; Maggs and Guiry, 1982)\ Gweebarra B. - Inishkeel 2000 coll. OM. Dunglow B. - Wyon Pt 1996 coll. & det. EMS (TCD: A1206); NE Terman 1996 coll. McC (TCD: A838)\ Tory I. - Tormore 1995 coll. EMS det. MDG (TCD: A333); near Scoltmorris 1995 coll. EMS det. CAM (TCD: A631)\ Sheephaven B. - Duncap I. 1995 coll. & det. EMS (TCD: A319)\ Rosguill - E. of Melmore Hd 1952/55 (Parkes, 1958b) & 1993 (*BioMar*); Outer Claddaghanillian B. 1993 (*BioMar*)\ Limeburners Rock 1993 (*BioMar*)\ Mulroy B. - Ravedy I.; Knox's Hole; Back Lough Narrows; Deegagh Pt; White Mares B.; Mullaghanhardy Pt; Millstone B.; Tirloughan B.; Ballyhoorisky Pt 1993 (*BioMar*)\ Fanad - W. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11332)\ Inishowen - Carrickabraghy 1996 coll. & det. McC (TCD: A884 & A885); Esky B. 1998 coll. & det. OM\ L. Swilly - Portnagarribane; S. side of Anny Pt 1993 (*BioMar*); Stuaker B. 1853 coll. WS (BEL: F3322)\ L. Foyle - Greencastle 1856 coll. WS (BEL: F7583; F7584); Moville to Greencastle & Ravenscliffe Reef 1937/39 (Blackler, 1951).

***Taonia atomaria* (Woodward) J. Agardh**

Thallus flattened without a midrib, irregularly branched. A south-western species (Norton, 1985) growing to 40cm long.

N. Atlantic: Azores to the British Isles but not in Scotland (South and Tittley, 1986).

Ireland: only one recent record from Northern Ireland (Morton, 1994). Very rare in Co. Donegal.

Donegal B. - Bundoran (Cotton, 1912). Dunglow B. - Arranmore I. (Brennan, 1945) & 1944 coll. & det. MdeV (UCG: 007985; 007986). South Channel 1996 coll. & det. CCM (TCD: A1052); Toninishgun Pt 1996 coll. & det. CSE (TCD: A1048)\ L. Foyle - Moville "floating" "part of a large specimen the only one got" 1853 coll. WS (BEL: F7595).

Ectocarpales

Acinetosporaceae

***Acinetospora crinita* (Carmichael) Sauvageau**

A small filamentous alga of interwoven tufts. Epiphytic.

N. Atlantic: Portugal to the British Isles and Greenland (South and Tittley, 1986).

Ireland: very rare, only one old record from Co. Donegal. All Records from Northern Ireland

are from the *NILS* of 1988 (Morton, 1994).

L. Swilly – Buncrana 1854 coll. WS (BEL: F7447).

***Hincksia* J. E. Gray**

Hardy and Guiry (2003) list seven species from the British Isles. Small densely branched tufts. Epiphytic.

***Hincksia granulosa* (J. E. Smith) P. C. Silva**

synonym *Ectocarpus granulosa* (J. E. Smith) C. Agardh

synonym *Giffordia granulosa* (J. E. Smith) G. Hamel

N. Atlantic: Portugal to Iceland and around the British Isles, in North America from New Jersey to Canada (South and Tittley, 1986).

Ireland: only one record from Co. Donegal but probably common and under-recorded. Recorded fairly frequently in Northern Ireland (Morton, 1994).

L. Foyle – Greencastle; Moville *circa* 1850s coll. WS (BEL: F7462; F7463).

***Hincksia hincksiae* (Harvey) P. C. Silva**

synonym *Ectocarpus hincksiae* Harvey

synonym *Giffordia hincksiae* (Harvey) G. Hamel

N. Atlantic: Portugal to Norway and Iceland and around the British Isles (South and Tittley, 1986).

Ireland: probably under-recorded. Common in Northern Ireland (Morton, 1994).

L. Foyle – Drumnaweir as *Ectocarpus hincksiae* 1937/39 (Blackler, 1951). The record in Sawers (1854) may be from L. Swilly or Foyle.

***Pylaiella littoralis* (Linnaeus) Kjellman**

synonym *Pilayella littoralis* (Linnaeus) Kjellman

A very common epiphyte, 2–25cm long, littoral and sublittoral. This is the only species of the genus in the British Isles where it is generally the most common small filamentous brown algae. Widely distributed.

N. Atlantic: around the whole of the North Atlantic in Europe from Portugal to Spitzbergen, Iceland, Greenland and on the coast of America from Canada to Virginia (South and Tittley, 1986).

Ireland: common, recorded from many counties in Ireland (Guiry, 1978) and very common in

Northern Ireland (Morton, 1994). No-doubt very under-recorded. First recorded in the county in 1891.

Donegal B. – Bundoran 1891 coll. probably Lea (BM); Doorin Pt 2002 coll. OM (BEL: F11948)\ Mulroy B. – 1952/55 (Parkes, 1958b)\ Inishtrahull 2000 coll. JN det. OM (BEL: F11937)\ L. Foyle – Greencastle to Whitecastle 1937/39 (Blackler, 1951).

Chordariaceae

***Asperococcus bulbosus* J. V. Lamouroux**

A relatively large thallus to 30cm long, inflated and cylindrical. Widely distributed around the British Isles (Fletcher,1987), littoral and sublittoral.

N. Atlantic: Portugal to the Faroës, Norway and the British Isles (South and Tittley, 1986).

Ireland: recorded from several counties, few recent records, rather rare.

Greencastle 1937/39 (Blackler, 1951).

***Asperococcus compressus* A. W. Griffiths ex W. J. Hooker**

A relatively large alga, up to 80cm long. Epiphytic and epilithic in littoral rock pools and in the sublittoral. Widely distributed around the British Isles (Fletcher, 1987).

N. Atlantic: Spain to the Shetlands and Norway (South and Tittley, 1986).

Ireland: rare, few records from Co. Donegal. All the records from Northern Ireland are recent and due to the *NILS* (Morton, 1994).

Go I. 1896 (dredged by Johnston and Hensman – anon, 1896)\ Culdaff undated (Blackler, 1951)\ L. Foyle – Ravenscliffe Reef (drift) 1937/39 (Blackler, 1951).

***Asperococcus fistulosus* (Hudson) W. J. Hooker**

Similar to the other species of *Asperococcus* growing to a length of 40cm, generally epiphytic in the lower littoral and sublittoral. Said to be common and widely distributed around the British Isles (Fletcher, 1987).

N. Atlantic: European shores from Spain to Iceland and Greenland, also North America from Newfoundland to Connecticut (South and Tittley, 1986).

Ireland: recorded from most counties in Guiry (1978), common in Northern Ireland (Morton, 1994).

Donegal B. – Bundoran 1975 coll. & det. OM (BEL: F105)\ Mulroy B. – 1979 coll. Minchin (BEL: F2373; F2374); Sladdannavooghag 1952/55 (Parkes, 1958a)\ Mark's Pt (2) 1993 coll.

BEP det. MDG (TCD: A37)\ Inishowen - Carrickabraghy 1996 coll. McC det. MDG (TCD: A910; A894); Portmore Harbour 1995 coll. EMS det. MDG (TCD: A305)\ L. Foyle - Greencastle to Whitecastle 1937/39 (Blackler, 1951).

***Chordaria flagelliformis* (O. F. Müller) C. Agardh**

Branched and thread-like up to 70cm long. Epilithic in the littoral.

N. Atlantic: Europe from France to the British Isles, Spitzbergen, Iceland and Greenland. On the coast of North America from Canada to Connecticut (South and Tittley, 1986).

Ireland: fairly common in Northern Ireland but more rarely recorded from Co. Donegal.

Gweebarra B. - Portnoo 1955 coll. KMD (BM); 2000 coll. & det. OM\ Dunglow B. - Aranmore I. 1944 coll. & det. MdeV (UCG: 008116)\ Inishbofin B. - Meenlaragh 1944 coll. & det. Brennan (UCG: 008112)\ Mulroy B. - Back Lough Narrows 1993 coll. BEP det. MDG (TCD: A41)\ L. Foyle - Greencastle 1856 coll. WS (BEL: F7518); Clare 1937/39 (Blackler, 1951).

***Dictyosiphon foeniculaceus* (Hudson) Greville**

Two species recorded in the British Isles, both of which have been recorded from Ireland and only one from Co. Donegal. A filamentous species growing to about 30cm in length. In the littoral and sublittoral, epilithic and epiphytic.

N. Atlantic: France to the Shetlands, Spitzbergen and Iceland also Greenland. In North America from Canada to New Jersey (South and Tittley, 1986).

Ireland: eight counties in Ireland (Guiry 1978) and common in Northern Ireland, especially Co. Down (Morton, 1994). Not uncommon but widely distributed.

Donegal B. - St John's B. 1972 coll. & det. MdeV (UCG: 004407)\ Mulroy B. - Sladdannavooghog 1953 (Parkes, 1958a)\ L. Foyle - Greencastle 1855 coll. WS (BEL: F7676); Moville 1855 coll. WS (BEL: F7677); Greencastle to Clare 1937/39 (Blackler, 1951).

***Elachista* Duby**

A small genus of four species in the British Isles. Epilithic, forming small tufts little more than 2 to 5cm long, all rather similar.

***Elachista flaccida* (Dillwyn) Fries**

Grows as dense tufts epiphytic on *Cystoseira* and *Halidrys* in the low-littoral and sublittoral, generally distributed around the British Isles (Fletcher, 1987).

N. Atlantic: Portugal to the Faroës and Shetland (South and Tittley, 1986).

Ireland: recorded from several counties in Ireland, only one record from Northern Ireland (Morton, 1994) and only one record from Co. Donegal.

Donegal B. - Bundoran 1955 coll. Dickinson (BM).

***Elachista fucicola* (Valley) Areschoug**

Epiphytic, usually on *Fucus vesiculosus* and *F. serratus* in the littoral. Distribution world-wide and common (Fletcher, 1987).

N. Atlantic: Portugal to the Faroës, Spitsbergen, Greenland and the Atlantic coast of North America (South and Tittley, 1986).

Ireland: common but under-recorded. Common in Northern Ireland (Morton, 1994).

Donegal B. - Bundoran 1891 coll. Lea (BM); St John's Pt 1999 coll. & det. OM (BEL: F11827)\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11262)\ Fanad - W. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11324)\ L. Swilly - N. Ballymastocker B. 1997 coll. & det. OM (BEL: F11371)\ Inishtrahull 2000 coll. JN det. OM (BEL: F11934)\ Inishowen - Dunagree Pt 1998 coll. OM.

***Elachista scutulata* (J. E. Smith) Duby**

Growing as small tufts, no more than 10mm in height, epithytic on *Himanthalia*. Common and widely distributed around the British Isles (Fletcher, 1987).

N. Atlantic: Portugal to the Faroës, but not in North America (South and Tittley, 1986).

Ireland: occasional. Probably under-recorded and may be quite common where *Himanthalia* is found.

Donegal B. - Bundoran 1891 coll. Lea (BM)\ Port-na-Blagh 1996 coll. & det. OM (BEL: F11284).

***Eudesme virescens* (Carmichael ex Berkeley) J. Agardh**

synonym *Castagnea virescens* (Carmichael ex Berkeley) Thuret

Epilithic and epiphytic in the littoral and sublittoral.

N. Atlantic: widely distributed, France to Sheltand, Iceland and Greenland. On the Atlantic coast of North America from, Canada to Connecticut (South and Tittley, 1986).

Ireland: recorded from several counties (Guiry, 1978). Rare.

Donegal B. - Bundoran 1897 coll. Lea (BM)\ Inishfree B. - Magheragallon 1995 coll. & det.

OM (BEL: F11198)\ Mulroy B. - Sladdannavooghog 1952/55 (Parkes, 1958a)\ Inishowen - Malin (TCD); Moville coll. 1850s WS (BEL: F7525) & Ravenscliffe Reef, Moville 1939 (Blackler, 1951).

***Isthmoplea sphaerophora* (Carmichael ex Harvey) Kjellman**

An inconspicuous filamentous epiphyte growing to a height of about 7cm, may well be overlooked.

N. Atlantic: France, the British Isles to Spitsbergen, Iceland, Greenland and in North America from Canada to Maryland (South and Tittley, 1986).

Ireland: considered very rare in Northern Ireland until the *NILS* recorded it fairly frequently (Morton, 1994). There is only one record from Co. Donegal.

L. Foyle - Greencastle 1854 coll. WS (BEL: F7684; F7685; Sawers, 1854).

***Leathesia difformis* (Linnaeus) Areschoug**

A common epiphyte in midlittoral in shallow rock pools, commonly epiphytic, distributed world-wide and readily identified.

N. Atlantic: Azores to the British Isles, Shetland, Iceland and on the Atlantic coast of North America from Newfoundland to Virginia (South and Tittley, 1986).

Ireland: abundant.

Donegal B. - Bundoran 1975 coll. & det. OM (BEL: F102); Murles Pt 1994 coll. & det. MDG (UCG: 008896)\ Gweebarra B. - Rossbeg 2000 coll. & det. OM; Inishkeel 2000 coll. & det. OM\ Inishfree B. - Magheragallon 1995 coll. & det. OM (BEL: F11193)\ Sheephaven B. - Port-na-Blagh 1996 coll. & det. OM (BEL: F11288)\ Mulroy B. - The Narrows 1952/55 (Parkes, 1958a); Mark's Pt; E. of Gortnatraw B.; Ballyhoorisky Pt 1993 (*BioMar*)\ L. Swilly - 1853 coll. WS (BEL: F7527); Portnagarribane 1993 (*BioMar*)\ L. Foyle - Culdaff & Greencastle to Whitecastle 1937/39 (Blackler, 1951).

***Litosiphon laminariae* (Lyngbye) Harvey**

Grows as small, inconspicuous tufts up to about 40mm long, epiphytic on various algae, *Chorda*, *Alaria*, etc. in the lower littoral and sublittoral (Fletcher, 1987). Widely distributed.

N. Atlantic: Spain to Shetland and Iceland (South and Tittley, 1986).

Ireland: no records for Co. Donegal shown in Norton (1985), common in Northern Ireland (Morton, 1994).

Inishfree B. - Brinlack Port 1996 coll. McC det. MDG (TCD: A870)\ Inishbofin B. - Meenclady B. 1996 coll. McC det. MDG (TCD: A922; A923)\ Inishowen - Stroove 1854 coll. WS (BEL: F3326)\ L. Foyle - Greencastle & Clare 1937/39 (Blackler, 1951).

***Mesogloia vermiculata* (J. E. Smith) S. Gray**

A gelatinous branching alga up to 5cm long in the littoral and sublittoral.

N. Atlantic: Spain to the British Isles, Norway and Iceland but not in North America. (South and Tittley, 1986).

Ireland: noted as rare (Morton, 1994) with no recent records from Cos Antrim and Down but recorded from several other counties in Guiry (1978).

Dunglow B. - Wyon Pt 1997 coll. EMS det. CAM (TCD: A1173); Arranmore I. 1944 coll. & det. MdeV (UCG: 006155); Cruit I. 1944 coll. & det. MdeV (UCG: 006154)\ L. Swilly 1852 coll. WS (BEL: F3331)\ L. Foyle - Greencastle *circa* 1853 coll. SW (Blackler, 1951).

***Myrionema* Greville**

There are five species of *Myrionema* in the British Isles (Guiry, 1997), growing as small epiphytic or epilithic spots no more than 5mm across (Fletcher, 1987). Of the five, four are found in Ireland (South and Tittley, 1986) and recorded only from Co. Donegal.

***Myrionema strangulans* Carmichael ex Greville**

A summer annual forming small disk-shaped patches no more than 1mm across sometimes uniting to form a disk 5mm across on other algae, especially *Ulva* and *Enteromorpha*. Distribution world-wide (Fletcher, 1987), easily overlooked.

N. Atlantic: Azores to the Faroës, Iceland and Greenland. On the coast of North America from Canada to Virginia (South and Tittley, 1986).

Ireland: several counties (Guiry, 1978) but common in Northern Ireland (Morton, 1994). Only two records from Co. Donegal but probably not uncommon.

Mulroy B. 1952/55 (Parkes, 1958b)\ L. Foyle - Greencastle 1937/39 (Blackler, 1951).

***Myriotrichia clavaeformis* Harvey**

synonym *Myriotrichia filiformis* Harvey

Hardy and Guiry (2003) include both *M. filiformis* and *M. repens* in *M. clavaeformis*. Endophytic or epiphytic on various algae forming erect tufts, about 30-40mm long, visible to the naked eye, widely distributed around the British Isles (Fletcher, 1987). The records below

are all as *M. clavaeformis* or *M. filiformis*.

N. Atlantic: Portugal to the Faroës, Iceland and in North America (South and Tittley, 1986).

Ireland: rare, but probably overlooked.

Donegal B. - Bundoran 1891 coll. Lea (BM); Rolagh, Kilcar 1980 coll. EM det. MDG (UCG: 006239)\ Mulroy B. 1952/55 (Parkes, 1958b)\ L. Foyle - Greencastle; Moville & Ravenscliffe Reef 1937/39 (Blackler, 1951).

***Petrospongium berkeleyi* (Greville) Nägeli ex Kützing**

synonym *Cylindrocarpus berkeleyi* (Greville) P. L. et H. M. Crouan

Small, 10-20mm across, epiphytic or epilithic gelatinous "cushions", spreading irregularly, littoral (Fletcher, 1987).

N. Atlantic: Portugal to the British Isles (South and Tittley, 1986).

Ireland: recorded from six counties in Guiry (1978) but very rare in Northern Ireland (Morton, 1994). Harvey (1871), however, notes it as pretty generally distributed on the W. coast, being overlooked on account of it resembling the colour of the rock. Very rare only one record.

L. Foyle - Greencastle 1937/39 (Blackler, 1951).

***Phycocelis crouaniorum* Athanasiadis**

synonym *Chilionema reptans* (P. L. et H. M. Crouan) Sauvageau

Fletcher (1987) includes *Hecatonema reptans* Sauvageau and *Ectocarpus reptans* Reinke in synonomy with *Chilionema reptans*. Epiphytic on various algae, particularly *Fucus*, forming small spots up to 4mm in diameter. Lower littoral and shallow sublittoral. Widely distributed around the British Isles (Fletcher, 1987).

N. Atlantic: Spain to Scotland and in North America from Connecticut to Canada (South and Tittley, 1986).

Ireland: listed from three counties in Guiry (1978), but only one record from Co. Donegal. Possibly under-recorded.

L. Foyle - Moville on *Polysiphonia fibrata* 1937/39 (Blackler, 1951).

***Punctaria latifolia* Greville**

A flat membranous alga up to 30cm long, usually epiphytic in the lower littoral or sublittoral.

N. Atlantic: both sides of the north Atlantic from Portugal to Spitzbergen, Iceland and Greenland. In North America from Canada to Virginia (South and Tittley, 1986). Common and

widely dispersed around the British Isles (Fletcher, 1987).

Ireland: few records from Co. Donegal. Rare.

Mulroy B. – W. Ballyhoorisky 1944 coll. & det. MdeV (UCG: 007377)\ L. Foyle – N. Moville coll. WS (BEL: F7721); 1937/39 (Blackler, 1951).

***Sauvageaugloia griffithsiana* (A. W. Griffiths ex Harvey) G. Hamel ex Kylin**

Littoral, growing to 20cm. Rare.

N. Atlantic: Spain to the British Isles (South and Tittley, 1986).

Ireland: recorded from only one county in Guiry (1978), and not from Northern Ireland (Morton, 1994). Very rare.

Dunglow B. – Arranmore I. 1944 coll. & det. MdeV (UCG: 007531). The record in Sawers (1854) may be from L. Foyle or Swilly.

***Spermatochnus paradoxus* (Roth) Kützing**

A branched filamentous species growing to a length of 40cm, sublittoral.

N. Atlantic: France to Norway and around the British Isles (South and Tittley, 1986).

Ireland: occasional around Ireland (Guiry, 1978) with only two records from Northern Ireland (Morton, 1994). Very rare.

Mulroy B. 1979 coll. Minchin det. OM (BEL: F2371).

***Spongonema tomentosum* (Hudson) Kützing**

Only one species of this genus in the North Atlantic. A very common epiphyte on *Fucus* and other large algae, littoral and sublittoral.

N. Atlantic: Portugal to Iceland and along the Atlantic coast of North America (South and Tittley, 1986). Generally abundant in the British Isles.

Ireland: probably common but scantily recorded. Noted as common in Northern Ireland (Morton, 1994).

Donegal B. – Murles Pt 1994 coll. & det. MDG (UCG: 008895; *BioMar*)\ Mulroy B. 1952/55 (Parkes, 1958b)\ L. Foyle – Moville coll. WS (BEL: F7510); Ravenscliffe Reef & N. Moville 1937/1939 as *Ectocarpus minimus* Näg & *E. tomentosus* (Huds.) Lyngb. (Blackler, 1951).

***Stictyosiphon griffithanus* (Le Jolis) Holmes et Batters**

A small, 5-10 cm, tufted alga, littoral and sublittoral.

N. Atlantic: France to the Shetlands, Norway and Iceland and on the Atlantic shores of North America from Newfoundland to Massachusetts (South and Tittley, 1986). Rare in the British Isles.

Ireland: very rare, only one record from Co. Donegal and one from Northern Ireland (Morton, 1994). Guiry (1978) gives references for the species from four counties.

L. Foyle - Greencastle 1854 coll. WS (BEL: F7734) & 1937/39 (Blackler, 1951).

***Stilophora tenella* (Esper) P. C. Silva**

synonym *Stilophora rhizoides* (C. Agardh) J. Agardh

A branching filamentous species to 60cm long growing in the low littoral. Generally a southern species.

N. Atlantic: France to England and on the coast of North America from Quebec to Virginia (South and Tittley, 1986).

Ireland: from several counties (Guiry, 1978) with no recent records from Northern Ireland (Morton, 1994).

Dunglow B. - Terman 1996 coll. McC det. CAM (TCD: A1368 & A1369); Aranmore I. 1944 coll. & det. MdeV (UCG: 007955)\ Mulroy B. - Rough I. 1993 coll. CCM det. CAM (TCD: A550); Millstone B. 1993 coll. EMS det. CAM (TCD: A556)\ L. Foyle - Greencastle (floating) 1856 coll. WS (BEL: F7535); Moville 1855 coll. & det. WS (BEL: F3324; F7536).

***Striaria attenuata* (C. Agardh) Greville**

A branched epiphytic and sublittoral species. Up to 30cm long.

N. Atlantic: Europe from France to the British Isles, Norway and Sweden. On the east coast of North America from Newfoundland to Virginia (South and Tittley, 1986).

Ireland: from six counties in Guiry (1978), only a few old records from Northern Ireland and a few from Co. Donegal. Very rare, no recent records.

L. Swilly - Buncrana 1852 coll. WS (BEL: F7730)\ L. Foyle - Greencastle 1856 coll. WS (BEL: F7731); Moville 1854 coll. WS (BEL: F3323); Ravenscliffe Reef coll. Sawers & Morrison 1853 (Blackler, 1951).

***Ulonema rhizophorum* Foslie**

This small epiphyte forms light brown patches less than 1mm in diameter on *Dumontia*. Some consider it a species of *Myrionema*. Hardy and Guiry (2003) maintain it as a true species. See

Fletcher (1987) for further comments.

N. Atlantic: British Isles to the Faroës and in North America from New Hampshire to Newfoundland. Common, but probably rarely looked for (South and Tittley, 1986).

Ireland: Guiry (1978) notes that it is recorded from five counties. Only one record from Co. Donegal and two from Northern Ireland (Morton, 1994).

L. Foyle - Ravenscliffe Reef 1937/39 (Blackler, 1951).

Ectocarpaceae

Mostly relatively small filamentous plants, not readily identified and in general under-recorded.

***Ectocarpus* Lyngbye**

Newton (1931) noted 39 species and several varieties in this genus, since then it has been split into several different genera, with only two species from the British Isles remaining in the genus. Probably most are under-recorded. Only *E. siliculosus* is recorded from Co. Donegal. Both species are undoubtedly present and are common in Northern Ireland (Morton, 1994).

***Ectocarpus siliculosus* (Dillwyn) Lyngbye**

One of the most common small brown alga, divided by Newton (1931) into at least five named subspecies. Parke and Dixon (1976) amalgamated five of the "species" as detailed in Newton: *E. confervoides*; *E. crouanii*; *E. dasycarpus*; *E. erectus* and *E. penicillatus* into *E. siliculosus*. Common around the British Isles.

N. Atlantic: Portugal to the Faroës, Spitzbergen, Iceland and Greenland, in North America from Canada to New Jersey (South and Tittley, 1986).

Ireland: Norton (1985) shows only one record in all of the north of Ireland. Strangely, there are more in southern Ireland. However, it is common in the Northern Ireland (Morton, 1994). Surely abundant but very similar to *E. fasciculatus* and under-recorded.

Mulroy B. - 1952/55 (Parkes, 1958b)\ L. Foyle - Whitecastle to Moville 1937/39 (Blackler, 1951); Moville 1850s coll. WS (BEL: F7450; F7451).

Scytosiphonaceae

***Colpomenia peregrina* (Sauvageau) Hamel**

synonym *Colpomenia sinuosa* (Roth) Dèrbes et Solier var. *peregrina* Sauvageau

A convoluted spherical hollow thallus up to 9cm across, usually epiphytic (Fletcher, 1987).

Introduced, probably from the Pacific, first recorded in Britain in 1908 (Farnham, 1980). Distribution world-wide (Farnham, 1980).

N. Atlantic: Portugal to the Shetlands and in Canada (South and Tittley, 1986).

Ireland: first recorded in Ireland in 1934 (Lynn, 1935) and in Co. Donegal from Culdaff and Fanad Hd 1939 (Blackler, 1939).

Donegal B. - Murles Pt 1978 coll. MdeV det. OM (BEL: F1832); 1994 coll. & det. MDG (UCG: 008911; 008885; *BioMar*)\ Dunglow B. - NE Terman 1996 coll. & det. McC (TCD: A931)\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11254)\ Mulroy B. - Sladdannavooghog & several other sites in the bay 1953 (Parkes, 1958a)\ Fanad - Fanad Hd & Culdaff 1939 (Blackler, 1939).

***Petalonia fascia* (O. F. Müler) Kuntze**

There are three species of *Petalonia* found in the British Isles, two of which are recorded from Ireland, one from Co. Donegal. Grows as a flattened blade up to 40cm. Epilithic in the lower littoral. Very common with a world-wide distribution (Farnham, 1980).

N. Atlantic: Azores to the British Isles, Shetlands and Iceland and on the east coast of North America (South and Tittley, 1986).

Ireland: although common in Cos Antrim and Down (Morton, 1994), there are only two records from Co. Donegal.

L. Foyle - Greencastle & Ravenscliffe Reef 1937/39 (Blackler, 1951).

***Scytosiphon lomentaia* (Lyngbye) Link**

A common alga up to 40cm in length. Distributed world-wide and generally around the British Isles (Fletcher, 1987).

N. Atlantic: Azores to Spitzbergen, Iceland and Greenland. In North America from Canada to Virginia (South and Tittley, 1986).

Ireland: common.

Donegal B. - Murles 1978 coll. MdeV (BEL: F1825) & Murles Pt 1994 coll. & det. MDG (UCG: 008899; *BioMar*); St John's Pt 1990 (Foster and Dring, 1994); Fintragh B. 1999 coll. & det. OM; Muckross Hd 1996 coll. PD det. MDG (TCD: A851)\ Gweebarra B. - Portnoo 2000 coll. & det. OM\ Dunglow B. - Illancrone I. 1996 coll. & det. CAM (TCD: A1164)\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11271; F11272)\ Mulroy B.

1952/55 (Parkes, 1958b)\ Fanad - E. & W. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11334; F11352)\ L. Swilly 1854 coll. WS (BEL: F7726)\ L. Foyle - Moville undated det. WS (BEL: F7725); Greencastle to Whitecastle 1937/39 (Blackler, 1951).

Ralfsiales

Ralfsiaceae

***Ralfsia* Berkeley**

In some works previous to Fletcher (1987), it was considered that there were five species of *Ralfsia* in the British Isles. Fletcher, however, separated these into two genera: *Ralfsia* and *Strangularia* and described only one species of *Ralfsia* and two of *Strangularia*. The differences are microscopic. *Strangularia* has not been recorded in Co. Donegal. It has, however, been recorded in Northern Ireland (Morton, 1994). Guiry (1978) gives a number of references to this species on the west coast of Ireland and Fletcher (1987) refers to it as abundant and widespread.

***Ralfsia verrucosa* (J. E. Areschoug) J. E. Areschoug**

An relatively thick incrusting epilithic inconspicuous species. Distributed world-wide (Fletcher, 1987). As a dark brown crust on the rocks, it can be passed unnoticed and under-recorded.

N. Atlantic: Portugal to the Shetlands, Iceland and Greenland. On the east coast of North America from Canada to Virginia (South and Tittley, 1986).

Ireland: recorded from several counties in Ireland (Guiry, 1978), rarely from Co. Donegal but common in Northern Ireland (Morton, 1994).

L. Foyle - Greencastle 1937/39 (Blackler, 1951).

Cutleriales

Cutleriaceae

***Cutleria multifida* (J. E. Smith) Greville**

including *Aglaozonia parvula* (Greville) Zanardini

This species exists in two different phases. The sexual (*Cutleria*) phase is of erect flattened blades up to 40cm long, while the asexual (*Aglaozonia*) phase is relatively small, prostrate,

flattened and inconspicuous. Both phases generally sublittoral. Widely distributed around the British Isles (Fletcher, 1987).

N. Atlantic: Azores to the Faroës (South and Tittley, 1986).

Ireland: recorded from several counties (Guiry, 1978). First found in Co. Donegal as the *Aglaozonia* phase at Rathlin O'Birne in 1980. Common in the sublittoral in Cos Down and Antrim.

Donegal B. - Murles Pt 1994 (*BioMar*)\ Rathlin O'Birne I. 1980 (Maggs and Guiry, 1982b)\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11252; F11253); Deegagh Pt 1993 coll. & det. BEP (TCD: A56)\ Ballyhoorisky Pt 1993 coll. BEP det. MDG (TCD: A36).

Sporochanales

Sporochanaceae

***Carpomitra costata* (Stackhouse) Batters**

All early references (Guiry, 1978) in the literature of this species in Ireland are based on Miss A. Ball's find of drift material at Youghal, Co. Cork, first reported in Harvey and McKay (1836). De Valéra *et al.* (1979) reported it collected sublittorally in 1971 off the Aran Islands and later off Finavarra in Galway Bay, Co. Clare. British records are discussed in Maggs and Guiry (1982b) and a report of a single specimen dredged off the Isle of Man is noted in Hiscock and Maggs (1984). Sublittoral.

N. Atlantic: Azores to France and the British Isles (South and Tittley, 1986).

Ireland: very rare.

Donegal B. - St John's Pt 1982 coll. BEP det. CMH (BEL: F3931) & 1989 (Foster and Dring, 1994); Bullockmore 1984 coll. BEP (BEL: F5049); Portnagh Rock 1982 coll. BEP (BEL: F5317)\ Rathlin O'Birne I. 1980 - first record of the species in Co. Donegal (UCG: 003175; Maggs and Guiry, 1982b); 1996 coll. & det. BEP (TCD: A1040)\ Tory I. - Rinnamorreeny 1995 coll. & det. CSE (TCD: A346); Marnid Pt 1995 coll. & det. CSE (TCD: A350); Spike Rock 1995 coll. & det. BEP (TCD: A327).

***Sporochnus pedunculatus* (Hudson) C. Agardh**

Erect branched fronds up to 30cm long. Generally sublittoral to 18m (Fletcher, 1987).

N. Atlantic: Portugal to the British Isles (South and Tittley, 1986).

Ireland: very rare, first recorded in Co. Donegal by Sawers in 1853 at Moville.

Dunglow B. - South Channel 1996 coll. & det. CCM (TCD: A1049); Wyon Pt 1996 coll. & det. EMS (TCD: A1178)\ L. Foyle - Moville 1853 coll. WS (BEL: F7636); Moville (drift) 1937/39 (Blackler, 1951). The record in Sawers (1854) may be from L. Swilly or Foyle.

Tilopteridales

Tilopteridaceae

***Tilopteris merensii* (Turner) Kützing**

A tufted and branched frond up to 30cm long. Epilithic in the lower littoral and sublittoral.

N. Atlantic: France to Scotland and in North America from Newfoundland to Massachusetts (South and Tittley, 1986).

Ireland: from several counties in Ireland (Guiry, 1978), but rare. All three records from Northern Ireland are 19th century and at least two were dredged (Morton, 1994). Only one old record from Co. Donegal.

L. Foyle - N. Moville 1937/39 (Blackler, 1951).

Desmarestiales

Arthocladiaceae

***Arthocladia villosa* (Hudson) Duby**

Erect branched fronds to 40cm long, epilithic or epiphytic in the low-littoral and sublittoral. Generally distributed around the British Isles (Fletcher, 1987). A south-western species.

N. Atlantic: Europe from Portugal to the British Isles and in North America from Massachusetts to Virginia (South and Tittley, 1986).

Ireland: only two old records.

L. Foyle - Clare 1850s coll. WS (Sawers, 1854) & 1937/39 (Blackler, 1951); Moville (floating) 1852 coll. WS (BEL: F7657).

Desmarestiaceae

***Desmarestia aculeata* (Linnaeus) J. V. Lamouroux**

vernacular name Landlady's Wig

An erect branching frond up to 1m long. Epilithic in low water rock pools and the sublittoral.

Generally distributed around the British Isles except the east of England (Norton, 1985)

N. Atlantic: Portugal to the British Isles, Spitsbergen, Iceland and Greenland. On the coast of North America from Canada to New Jersey (South and Tittley, 1986).

Ireland: common in Ireland and Co. Donegal.

Dunglow B. - Wyon Pt 1996 coll. & det. EMS (TCD: A1177)\ Sheephaven B. - Downies 1886 coll. JM (BEL: F3404; F3391)\ Mulroy B. - 1952/55 (Parkes, 1958b); W. of Knox's Hole 1993; SW of Campbells Bed 1993 (*BioMar*); Millstone B. 1993 coll. & det. CSE (TCD: A58)\ Inishowen - Bulbinbeg & Dunagree Pt 1998 coll. & det. OM\ L. Foyle - Moville 1856 coll. WS (BEL: F7644); abundant in drift Greencastle to Clare growing, attached, at Greencastle 1937/39 (Blackler, 1951).

***Desmarestia dresnayi* J. V. Lamouroux ex Leman**

Not included in South and Tittley's Checklist (1986) but included by Fletcher (1987) and Hardy and Guiry (2003). Forms a delicate blade with a thin midrib to 35cm long. Epilithic on stones in the sublittoral.

Sawers in 1853 was the first in Ireland to collect this species which was named *D. pinnativervia* by Dr Montagne. He noted the specimen "...got near Greencastle and Moville mouth of Lough Foyle...Autumn 1853" (BEL: F7645). All records from the Co. Donegal area appear to be based on this single 1853 find published by Morris (1854) and Sawers (1854) and later by Blackler (1951) among others. The British records are reviewed by Blackler (1961). There are two specimens in TCD, but with no collector's name attached, and six specimens in BM, dated 1853 were collected by Sawers. There is one record undetailed from L. Foyle, which may be in Co. Derry or Co. Antrim, collected between 1804 and 1889 in the herbarium of Mary P. Merryfield in the BM. Recently, a specimen was found at Altacorry Hd, Rathlin I, Co. Antrim 19m below CD coll. & det. CAM (BEL: F5037).

***Desmarestia ligulata* (Lightfoot) J. V. Lamouroux**

Grows as an erect flattened and branched thallus to 1m long. Epilithic in the low littoral into the sublittoral.

N. Atlantic: Europe from Portugal to Iceland (South and Tittley, 1986) and generally around the British Isles (Fletcher, 1987).

Ireland: not common but probably more common in the sublittoral and under-recorded.

Donegal B. – Bundoran 1840s (BEL: F7647)\ Dunglow B. – Wyon Pt 1996 coll. & det. EMS (TCD: A1186); Inishkeeragh 1996 coll. & det. McC (TCD: A1181); Arranmore Is (Brennan, 1950)\ S. side of Limeburners Rock 1993 (*BioMar*)\ Mulroy B. – Mulroy B. (drift) 1952/55 (Parkes, 1958b); Millstone B. 1993 (*BioMar*)\ L. Foyle – Moville 1854 coll. WS (BEL: F7649) & Clare (drift) 1937/39 (Blackler, 1951).

***Desmarestia viridis* (O. F. Müller) J. V. Lamouroux**

Well branched erect thallus 0.5m long. Epilithic in shaded low-littoral rock pools and in the sublittoral to 10m. World-wide distribution and generally distributed around the British Isles (Fletcher, 1987).

N. Atlantic: Europe on the shores of France, Norway, Iceland and Greenland. North America along the coast from Canada to New Jersey (South and Tittley, 1986).

Ireland: rather rare, possibly under-recorded.

Donegal B. – St John's Pt 1989 (Foster and Dring, 1994); Wyon Pt 1996 coll. EMS det. CCM (TCD: A1211)\ Dundlow B. – South Channel 1996 coll. & det. CCM (TCD: A1213); Arranmore I. 1944 coll. & det. MdeV (UCG: 004372)\ L. Foyle – Moville 1856 coll. WS (BEL: F7656) & 1937/39 (Blackler, 1951).

Lamariales

Alariaceae

***Alaria esculenta* (Linnaeus) Greville**

vernacular names Dabberlocks, Edible Kelp

A well known alga. Long flattened thallus with a midrib to 5m. Common around the British Isles, especially on exposed shores where it may form a dominant zone at low-water and the upper sublittoral (Lewis, 1964).

N. Atlantic: a northern species on European coasts from France, and around the coasts of the north Atlantic (South and Tittley, 1986).

Ireland: widespread and common on the western and exposed shores.

Donegal B. – Bunatrahan 2002 coll. & det. OM; Murles Pt 1994 coll. & det. MDG (UCG: 008882); near St John's Pt 1999 coll. & det. OM; Rolagh 1980 coll. EM det. MDG (UCG: 002684)\ Gweebarra B. – Portnoo 2000 coll. & det. OM\ Inishowen – Carrickabraghy 1996

coll. McC det. MDG (TCD: A925); Malin Hd 1864 coll. JM (BEL: F3370); Bulbinbeg 1998 coll. & det. OM (BEL: F11634) & Dunagree Pt 1998 coll. & det. OM.

Chordaceae

***Chorda filum* (Linnaeus) Stackhouse**

vernacular name Sea Lace

Another well known alga. Long unbranched slippery thallus up to several meters long, in sheltered localities. It can be abundant in mud or sand. There are two species of *Chorda*, the other being *C. tomentosa* Lyngbye - a rare species but similar to *C. filum*.

N. Atlantic: Portugal to New Jersey in America as far north as Spitsbergen (South and Tittley, 1986).

Ireland: common, but no records from Co. Donegal are shown in Norton (1985).

Donegal B. - St John's Pt 1972 coll. & det. MdeV (UCG: 003559; 003558 & 003556); 1976 coll. & det. MdeV (UCG: 003555)\ Gweebarra B. - Rossbeg 2000 coll. & det. OM; Inishkeel 2000 coll. & det. OM (BEL: F11923)\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11248)\ Mulroy B. - The Narrows; Portnalong 1952/55 (Parkes, 1958a, b); Back Lough Narrows; SE of Deegagh Pt; SW of Rough I.; E. of Gortnatraw B.; SW of Campbells B.; Mullaghanhardy Pt; S. of Greers I. & Ballyhoorisky Pt 1993 (*BioMar*)\ Inishowen - Dunagree Pt 1998 coll. OM\ L. Swilly - Greencastle to Drung 1937/39 (Blackler, 1951)\ L. Foyle - Moville 1856 coll. WS (BEL: F7751).

Laminariaceae

***Laminaria digitata* (Hudson) J. V. Lamouroux**

vernacular names Oarweed, Tangle

One of the most common algae. The large flat thalli often dominate the shore at the low and sublittoral in exposed areas.

N. Atlantic: Portugal to New Jersey in America as far north as Spitsbergen (South and Tittley, 1986).

Ireland: no records of it at all from Co. Donegal in Norton (1985). Abundant.

Donegal B. - Bundoran 1891 coll. Lea (BM); Bunatrahan 2002 coll. & det. OM; Murles Pt 1994 (*BioMar*); Kiln Port 1999 coll. OM; near St John's Pt 1999 coll. OM; Fintragh B. 1999 coll. OM\ Gweebarra B. - Portnoo 2000 coll. OM; Inishkeel 2000 coll. OM\ Dunglow B. -

Arranmore (Brennan, 1950)\ Tory I. - *circa* 1845 coll. GCH (Hyndman, 1853 and other publications)\ Mulroy B. - Tranafaighaboy B. & Gortnalughoge 1952/55 (Parkes, 1958a); Back L. Narrows; Mark's Pt (1), Broadwater; W. of Ballyhoorisky I. & Ballyhoorisky Pt 1993 (*BioMar*)\ L. Swilly - Portnagarribane; Great Pollet Arch 1993 (*BioMar*)\ Inishowen - Pollan B.; Malin Hd (Brennan, 1950); Bulbinbeg 1998 coll. OM\ L. Foyle - Greencastle to Whitecastle 1937/39 (Blackler, 1951).

***Laminaria hyperborea* (Gunnerus) Foslie**

synonym *Laminaria cloustoni* Edmondst

Large leathery thallus similar to *L. digitata* but larger and tougher, forming a zone below *L. digitata*. Usually dominant in a sublittoral zone exposed only at low spring tides.

N. Atlantic: Portugal to Iceland (South and Tittley, 1986), however, unlike *L. digitata*, not found in North America.

Ireland: abundant and dominating the sublittoral.

Donegal B. - Murles Pt 1994 (*BioMar*); St John's Pt 1989 & 1990 (Foster and Dring, 1994)\ Rathlin O'Birne 1980 (Maggs and Guiry, 1982b)\ Limeburners Rock & S. side of Limeburners Rock 1993 (*BioMar*)\ Rosguill - E. & W. of Melmore Hd; Outer Claddaghanillian B. 1993 (*BioMar*)\ Fanad - pre-1950 (Brennan, 1950)\ Mulroy B. - Dundooan Rocks; N. of Ravedy I.; W. of Knox's Hole; Millstone 1993 (*BioMar*)\ L. Swilly - Portnagarribane & S. side of Anny Pt 1993 (*BioMar*).

***Laminaria saccharina* (Linnaeus) J. V. Lamouroux**

vernacular names Sea Belt, Sugar Kelp, Sugarwrack

Thallus long, to 4m, but without a midrib. Grows generally in somewhat more sheltered sites where it replaces *L. digitata* and *L. hyperborea* (Lewis, 1964). To depths of about 20m.

N. Atlantic: Portugal, British Isles to Norway, Iceland and Greenland. North America from Canada to Connecticut (South and Tittley, 1986).

Ireland: very common.

Donegal B. - Bundoran 1891 coll. Lea (BM); Bunatrahan 2002 coll. & det. OM; Murles Pt 1994 (*BioMar*); Kiln Port 1999 coll. & det. OM; St John's Pt 1999 coll. & det. OM\ Gweebarra B. - Portnoo 2000 coll. & det. OM; Inishkeel 2000 coll. & det. OM\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11250)\ Mulroy B. - Back Lough Narrows;

SE of Deegagh Pt; SW of Rough I.; E. of Gortnatraw B.; White Mares B., Broadwater; SE of Mullaghanhardy Pt; Moross Castle; Stookan Rocks; Millstone B.; Dundooan Rocks 1993 (*BioMar*)\ Mulroy B. - near Sladdannovooghag 1952/55 (Parkes, 1958a); Ballyhoorisky Pt 1952/55 (Parkes, 1948a and *BioMar*)\ Fanad - pre-1950 (Brennan, 1950); Ballyhiernan B. 1997 coll. & det. OM\ Inishowen - Esky B.; Bulbinbeg & Dunagree Pt 1998 coll. & det. OM\ L. Foyle - Greencastle to Whitecastle 1937/39 (Blackler, 1951).

Phyllariaceae

***Saccorhiza polyschides* (Lightfoot) Batters**

One of the large, if not the largest, seaweeds of the British Isles. Large, deeply segmented frond with a flat stipe and a wavy margin. Epilithic, a southern species, quite common to abundant in the British Isles in places in the upper sublittoral zone.

N. Atlantic: European coasts from Portugal to Norway, its northern limit, not found in America (South and Tittley, 1986).

Ireland: probably common in places on the west coast.

Donegal B. - Murles Pt 1994 coll. & det. MDG (UCG: 008902)\ Rathlin O'Birne 1980 (Maggs and Guiry, 1982b)\ Tory I. pre-1880 (Mahony, 1880)\ Gweebarra B. - Portnoo 1955 coll. KMD (BM)\ Mulroy B. - Back Lough Narrows 1993 (*BioMar*)\ Inishowen - Culdaff 1937/39 (Blackler, 1951); Dunagree Pt 1998 coll. OM\ L. Foyle - Greencastle (drift) to N. Moville 1937/39 (Blackler, 1951).

Fucales

Cystoseiraceae

***Bifurcaria bifurcata* R. Ross**

An alga with branching thallus to 50cm long.

N. Atlantic: Portugal north to the British Isles, but not on American coasts (South and Tittley, 1986).

Ireland: Lewis (1964) refers to this as a southern species found "around the west coast of Ireland ...to north Donegal". The distribution map in Norton (1985) clearly shows this south-westerly distribution. There are only three confirmed records of it from Co. Donegal. Generally found in low-littoral rock pools. Rare.

Malin Beg 1953 coll. Lewis (deValéra, 1962)\ Fanad - Fanad Hd 1953 coll. Lewis (de Valéra, 1962; Crisp, 1964; Forster and Dring, 1994)\ L. Swilly - Portnagarribane 1993 (*BioMar*).

***Cystoseira* C. Agardh**

Guiry (1997) lists five species of *Cystoseira* in the British Isles. Four have been recorded from Co. Donegal. All have tough branching thalli up to 60 or 70cm long in some species.

***Cystoseira baccata* (S. G. Gmelin) P. C. Silva**

A very bushy epilithic alga of southern distribution, growing in low rock pools and in the sublittoral.

N. Atlantic: coast of Europe from Portugal north to Ireland and England (South and Tittley, 1986), a southern species.

Ireland: Norton (1985) shows it to be clearly a south-western species without any records north of Co. Mayo. There are however a few old records from Northern Ireland (Morton, 1994) and some more recent ones from Co. Donegal. Very rare.

Donegal B. - Bundoran 1891 coll. Lea det. Roberts (BM). Mulroy B. 1983 (Lewis and Powell, 1960)\ Dunglow B. - S. of Carrickbealatroha 1996 coll. EMS det. MDG (TCD: A1250)\ L. Swilly - Portnagarribane 1993 coll. CCM det. MDG (TCD: A46)\ Inishowen - W. of Malin Hd 1953-1963 (Crisp, 1964).

***Cystoseira foeniculaceus* (Linnaeus) Greville**

Much branched, the deciduous laterals leaving characteristic raised scars on axis.

N. Atlantic: Portugal, France and the British Isles (South and Tittley, 1986).

Ireland: few records for all Ireland shown in Norton (1985). Only one record from Co. Donegal. Very rare.

Donegal B. - Bundoran 1975 coll. & det. OM det. Roberts who noted a "puzzling feature - length of receptacles" (BEL: F277).

***Cystoseira nodicaulis* (Withering) M. Roberts**

synonym *Cystoseira granulata* C. Agardh

Epilithic, generally sublittoral, growing to 40cm long or more.

N. Atlantic: Portugal north to the British Isles on European coasts (South and Tittley, 1986).

Ireland: Norton (1985) shows few records in all Ireland and none from Co. Donegal. However,

Roberts (1977) reported it from Donegal. Growing in the low-littoral into the sublittoral. Very rare.

Donegal B. – Bundoran B. 1969 coll. & det. OM conf. Roberts (BEL: F2723); Murle's Pt 1994 coll. & det. MDG (UCG: 008880); 1995 (*BioMar*)\ Gweebarra B. – Rossbeg 1955 coll. KMD (BM); Portnoo 1955 coll. KMD det. Roberts (BM)\ Mulroy B. – Tranafaighaboy & Gortnalughoge (drift) 1952/55 (Parkes, 1958a)\ Inishowen – Malin Hd 1953, 1958 & 1963 (Crisp, 1964: as *C. granulosa* – considered a synonym).

***Cystoseira tamariscifolia* (Hudson) Papenfuss**

Epilithic and bushy, notable for the iridescent colours of blue and green. Littoral.

N. Atlantic: European coast from the Azores north to the British Isles (South and Tittley, 1986).

Ireland: scattered sites in Ireland with only three records from Co. Donegal and two from Northern Ireland (Morton, 1994).

Donegal B. – Bundoran 1891 coll. Lea (BM)\ Gweebarra B. – Rossbeg 1955 coll. KMD (BM). Fanad Hd 1989 (Foster and Dring, 1994).

***Halidrys siliquosa* (Linnaeus) Lyngbye**

vernacular name Sea Oak

A species which can reach over 2m long with stiff pod-like air floats on its branches. Littoral and sublittoral to a depth of about 20m.

N. Atlantic: Portugal to the British Isles and the Shetlands (South and Tittley, 1986). Widely distributed.

Ireland: common in places and dominant in rock pools of the *Fucus serratus* zone.

Donegal B. – Bundoran 1891 coll. Lea (BM); 1975 coll. & det. OM; Murles Pt (*BioMar*); Fintragh B. 1999 coll. & det. OM (BEL: F11837)\ Rathlin O'Birne 1980 coll. & det. CAM (UCG: 005275)\ Gweebarra B. – Inishkeel 2000 coll. & det. OM\ Rosguill – W. & E. of Melmore Hd 1993 (*BioMar*)\ Mulroy B. – Millstone B.; N. of Ravedy I.; W. of Knox's Hole; Dundooan Rocks; N. of Tirloughan B.; Mark's Pt (2), Broadwater; Ballyhoorisky Pt 1993 (*BioMar*) & near Sladdannavooghog 1952/55 (Parkes, 1958a)\ Fanad (Brennan, 1950); W. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11342)\ L. Swilly – Portnagarribane 1993 (*BioMar*)\ Inishowen – Carrickabraghy 1996 coll. McC (TCD: A905) & Doagh I. 1996 (TCD:

A906); Esky B. & Bulbinbeg 1998 coll. & det. OM\ L. Foyle - Redcastle; Clare; N. Moville; Greencastle 1937/39 (Blackler, 1951).

Fucaceae

***Ascophyllum nodosum* (Linnaeus) Le Jolis**

vernacular name Knotted Wrack

Perhaps the best known alga, dominant on sheltered rocky shores forming an algal zone in the mid-littoral. Long branched thallus with large air bladders. On more exposed growing only as dwarf plants often without air-bladders.

N. Atlantic: common from Portugal to Spitzbergen, Iceland and Greenland. North America from Canada to Virginia (South and Tittley, 1986).

Ireland: on most, save the most exposed and occasionally the semi-exposed, shores. Abundant.

Donegal B. - Murles Pt 1994 (*BioMar*)\ Gweebarra B. - Rossbeg 2000 coll. OM; Inishkeel 2000 coll. OM\ Tory I. - *circa* 1845 coll. GCH? (Hyndman, 1853)\ Sheephaven B. - The Caskins 1996 coll. & det. OM\ Mulroy B. - Bunlin B.; Moross Strand Hd; Trabeg; Portnalong; Drumnacraig 1952/55 (Parkes, 1958a, b); Back Lough Narrows; Gortnatraw B.; Mark's Pt & Ballyhoorisky 1993 (*BioMar*); Gola More 1997 coll. & det. OM\ L. Swilly - N. Ballymastocker B. 1997 coll. OM\ Inishtrahull 2000 coll. JN det. OM\ Inishowen - Esky B. 1998 coll. & det. OM.

There is much variation in this genus and further research is required to clarify the position as to whether these are varieties, forms or ecads (Gibb, 1957).

f. ***nodosum***

Mulroy B. - Sladdannavooghog 1953 (Parkes, 1958a).

ecad ***mackaii***

Mulroy B. - (Gibb, 1957); Devlinmore; Bunlin B.; Rosgarrow; Millford Port; White Sands B.; Moross Strand Hd; Trabeg 1952/55 (Parkes, 1958a, b)\ L. Foyle - Greencastle to near Drumaweir, 1937/39 (Blackler, 1951).

***Fucus ceranoides* Linnaeus**

A thin thallus with irregular swellings, not air bladders. Found in sheltered estuaries of brackish-water.

N. Atlantic: Azores, around the British Isles to Iceland (South and Tittley, 1986).

Ireland: quite common in suitable places.

Donegal B. - Bundoran 1891 coll. Lea (BM); Murles Pt 1994 (*BioMar*); Kiln Port 1999 coll. & det. OM (BEL: F11845)\ Lackagh Bridge 1996 coll. & det. OM (BEL: F11290; F11291)\ Mulroy B. - Tirloughan B.; The Narrows; Cranford; Bunlin B.; Keadew Bridge 1952/55 (Parkes, 1958b); Carrickart 1995 coll. & det. OM (BEL: F11216)\ L. Swilly - River Crana near Buncrana 1969 coll. & det. OM (BEL: F3094; F3095; F7624; F7625)\ L. Foyle - Greencastle to Whitecastle 1937/39 (Blackler, 1951); Moville *circa* 1850s coll. WS (BEL: F7775).

***Fucus cottonii* M. J. Wynne et Mange**

synonym *Fucus muscoides* (A. D. Cotton) Feldmann et Mange

Small, no more than 4cm long, growing as a mossy growth turf in the upper littoral on very sheltered shores.

N. Atlantic: European shores from France to the British Isles (South and Tittley, 1986).

Ireland: only once recorded in Co. Donegal, as *F. vesiculosus* var. *muscoides*, by Parkes (1958). Recorded from about six sites in Northern Ireland (Morton, 1994). Very rare.

Mulroy B. - The Narrows 1952/55 (Parkes, 1958b).

***Fucus distichus* Linnaeus**

This species, described as "...extremely plastic..., develops into a great variety of forms...". A detailed description and discussion will be found in Powell (1957a).

N. Atlantic: British Isles, Spitzbergen, Iceland, Greenland and the Atlantic coast of North America as far south as Massachusetts (South and Tittley, 1986).

Ireland: very rare, not recorded from Northern Ireland (Morton, 1994).

Inishowen - Malin Hd 1953 coll. & det. MdeV (UCG: 004801).

***Fucus distichus* Linnaeus subsp. *anceps* (Harvey et Ward) H. T. Powell**

Only the one subspecies *anceps* is recorded from Co. Donegal, described in Powell (1957). Relatively small, no more than 10cm long, with distichous branches lax towards the distal ends (Powell, 1957a). It is a sure indicator of exposure (Lewis, 1964: p. 264).

Inishowen - Malin Hd 1953 (Powell, 1957b: p. 665; Parkes, 1958a: p.280).

***Fucus serratus* Linnaeus**

vernacular name Toothed Wrack

A alga forming a zone in the lower littoral in semi-exposed sites. Easily identified by the toothed edge to the thallus. Norton (1985) shows no records from Co. Donegal and all the records listed below are recent.

N. Atlantic: European shores from Portugal to the British Isles, Iceland, and Canada (South and Tittley, 1986).

Ireland: very common except in exposed localities.

Donegal B. - Bundoran 1975 coll. & det. OM; Bunatrahan 2002 coll. & det. OM; Murles Pt 1994 (*BioMar*); Doorin Pt 2002; Kiln Port & near St John's Pt 1999 coll. & det. OM\ Gweebarra B. - Portnoo 2000 coll. OM; Inishkeel 2000 coll. & det. OM\ Inishfree B. - Gweedore B. 1995 coll. & det. OM; Brinlack Port 1996 coll. & det. McC (TCD: A938)\ Sheephaven B. - The Caskins 1996 coll. & det. OM (BEL: F11249); Downies 1886 coll. JM (BEL: F3394)\ Mulroy B. - Tranafaighaboy; Gortnalughoge 1952/55 (Parkes, 1958a); E. of Gortnatraw B. & Mark's Pt 1993 (*BioMar*); Gola More 1997 coll. & det. OM; Scoltnamaddy & Ballyhoorisky Pt 1952/55 (Parkes, 1958a); Ballyhoorisky 1993 (*BioMar*); N. Ballymastocker B. 1997 coll. OM\ L. Swilly - Portnagarribane 1993 (*BioMar*)\ Inishtrahull 2000 coll. JN det. OM (BEL: F11933)\ Inishowen - Esky B.; Bulbinbeg & Dunagree Pt 1998 coll. & det. OM\ L. Foyle - Culmore embankment to Greencastle 1937/39 (Blackler, 1951).

***Fucus spiralis* Linnaeus**

vernacular names Spiral Wrack, Twisted Wrack

One of the most common algae of the seashore, forming a zone near the upper littoral except on exposed shores. A few twisted small plants may be occasional found even in relatively exposed areas. Easily identified and under-recorded.

N. Atlantic: Azores to the British Isles, Iceland and on shores of North America (South and Tittley, 1986).

Ireland: Norton (1985) does not show any records from Co. Donegal, most of the records below are recent. Abundant.

Donegal B. - Bundoran 1975 coll. & det. OM; Bunatrahan 2002 coll. & det. OM; Doorin Pt 2002 coll. & det. OM; Fintragh 1999 coll. & det. OM\ Gweebarra B. - Rossbeg 2000 coll. &

det. OM; Portnoo 2000 coll. & det. OM; Inishkeel 2000 coll. & det. OM\ Inishfree B. - Gweedore B. 1995 coll. OM\ Meenclady B. 1996 coll. McC (TCD: A943)\ Mulroy B. - Tranafighaboy & Gortnalughoge 1952/55 (Parkes, 1958a); Gortnatraw B. & Mark's Pt, Broadwater 1993 (*BioMar*); Portnalong & Ballyhoorisky 1952/55 (Parkes, 1958a)\ L. Swilly - Great Pollet Arch 1993 (*BioMar*)\ Inishtrahull 2000 coll. JN det. OM (BEL: F11932)\ Inishowen - Carrickabraghy 1996 coll. McC det. MAG (TCD: A944); Esky B.; Bulbinbeg & Dunagree 1998 coll. & det. OM\ L. Foyle - Greencastle to Culmore embankment 1937/39 (Blackler, 1951).

***Fucus vesiculosus* Linnaeus**

vernacular name Bladder Wrack

A common species forming a zone in the midlittoral on the more sheltered shores, some occasional plants will be found on the more exposed shores. Readily identified by the air bladders in twos one on either side of the midrib. Different varieties and formae have been recorded in the literature and on herbarium specimens, including:- var. *angustifolia*; var. *sphaerocarpus* and f. *linearis*. However such forms and varieties are not now generally accepted.

N. Atlantic: Azores to the Shetlands, Spitzbergen, Iceland also Greenland. North America from Canada to Virginia (South and Tittley, 1986).

Ireland: it is not shown as present in Co. Donegal in Norton (1985). However it is abundant in all but the most exposed sites.

Donegal B. - Bundoran 1891 coll. Lea (BM) also 1969 & 1975 coll. & det. OM (BEL: F3086); Bunatrahan 2002 coll. & det. OM; Murles Pt 1994 (*BioMar*); Doorin Pt 2002 coll. & det. OM; Kiln Port 1999 coll. & det. OM; St John's Pt 1999 coll. & det. OM; Fintragh B. 1999 coll. & det. OM\ Gweebarra B. - Rossbeg 2000 coll. & det. OM; Inishkeel 2000 coll. & det. OM\ Inishfree B. - Rinageeragh Pt 1967 coll. & det. OM (BEL: F7620; F7618; F7619; F3082); Magheragallon 1995 coll. & det. OM\ Tory I. - *circa* 1845 coll. GCH? (Hyndman, 1853)\ Sheephaven B. - Meenclady B. 1996 coll. & det. McC (TCD: A928 & A945); The Caskins 1996 coll. & det. OM\ Mulroy B. - Tranfaighnaboy & Gortnalughoge 1952/55 (Parkes, 1958a); E. of Gortnatroy B. & at both sites named as Mark's Pt 1993 (*BioMar*); Drumnacraig B. 1952/53 (Parkes, 1958a); Ballyhoorisky Pt 1952/55 (Parkes, 1958) & 1993

(*BioMar*)\ Fanad - W. Ballyhiernan B. 1997 coll. & det. OM (BEL: F11345; F11346)\ L. Swilly - Great Pollet Arch 1993 (*BioMar*); N. Ballymastocker B. 1997 coll. & det. OM; Blackrock near Rathmullan 1968 coll. & det. OM (BEL: F3081)\ Inishtrahull 2000 coll. JN det. OM (BEL: F11934)\ Inishowen - Esky B. & Dunagree Pt 1998 coll. & det. OM\ Inishowen - along the W. coast of L. Foyle 1937/39 (Blackler, 1951).

***Pelvetia canaliculata* (Linnaeus) Decaisne et Thuret**

vernacular name Channelled Wrack

A common alga forming a zone in the upper littoral at high water. Readily identified by the channel along the underside of the thallus.

N. Atlantic: Portugal to the British Isles and Iceland (South and Tittley, 1986).

Ireland: most of the records below are recent. Common and abundant.

Donegal B. - Doorin Pt 2002 coll. & det. OM; Bundoran 1975 coll. & det. OM; Bunatrahan 2002 coll. & det. OM; Murles Pt 1994 (*BioMar*); Fintragh B. 1999 coll. & det. OM\ Gweebarra B. - Rossbeg 2000 coll. & det. OM; Portnoo 2000 coll. & det. OM; Inishkeel 2000 coll. & det. OM\ Inishfree B. - Gweedore B. 1995 coll. & det. OM\ Mulroy B. - NE entrance to Mulroy B. & The Narrows 1952/55 (Parkes, 1958a); Mark's Pt; E. of Gortnatraw B. & Mark's Pt (2), Broadwater; Great Pollet Arch 1993 (*BioMar*)\ Fanad - E. Ballyhiernan B. 1997 coll. & det. OM\ L. Swilly - Portnagarribane 1993 (*BioMar*)\ Inishtrahull 2000 coll. JN det. OM (BEL: F11931)\ Inishowen - Carrickabraghy 1996 coll. & det. McC (TCD: A895); Esky B.; Bulbinbeg 1998 & Dunagree Pt 1998 coll. & det. OM\ L. Foyle - Moville *circa* 1850s coll. WS (BEL: F7798); Greencastle to Culmore embankment 1937/39 (Blackler, 1951).

Himanthaliaceae

***Himanthalia elongata* (Linnaeus) S. F. Gray**

vernacular names Sea-thong, Thong-weed

Thallus forms a stalked "button", from the centre of which grows a long strap-like dichotomously dividing frond bearing conceptacles. Generally on exposed shores at the low littoral. Easily identified.

N. Atlantic: Portugal to the British Isles (South and Tittley, 1986).

Ireland: abundant in places. Not recorded from Co. Donegal in Norton (1985). Common.

Donegal B. - Bundoran 1891 coll. Lea (BM); Bunatrahan 2002 coll. & det. OM; Murles Pt

1994 coll. & det. MDG (UCG: 008901; *BioMar*); St John's Pt 1999 coll. & det. OM; Muckross Hd 1996 McC (TCD: A917)\ Gweebarra B. - Portnoo 2000 coll. & det. OM\ Dunglow B. - Arranmore I. (Brennan, 1950)\ Inishfree B. - Magheragallon 1995 coll. & det. OM\ Tory I. - *circa* 1845 coll. GCH? (Hyndman, 1853 and repeated in other publications)\ Sheephaven B. - Port-na-Blagh 1996 coll. & det. OM (BEL: F11294)\ Mulroy B. - between the entrance point & Sladdannavooghog; Invermore B.; The Narrows & Ballyhoorisky Pt 1952/55 (Parkes, 1958a); Mark's Pt (2) & Mark's Pt (1), Broadwater 1993 (*BioMar*)\ Fanad - (Brennan, 1950)\ L. Swilly - Portnagribane; Great Pollet Arch 1993 (*BioMar*)\ Culdaff 1937/39 (Blackler, 1951)\ Inishowen - Malin Hd & Esky B. (Brennan, 1950); Bulbinbeg 1998 coll. OM.

Cyanophyta

Cyanophyceae

This division of the plant kingdom, commonly referred to as the blue-green algae, is placed in the Kingdom Eubacteria which, with the bacteria, make up the Prokaryota. They do not possess nuclei, the DNA lying free in the cell, nor do they possess mitochondria and other organelles as found in the algae and higher plants. The Cyanophyta contains only one Class, the Cyanophyceae (van den Hoek *et al.*, 1995). In spite of the fact that they are more closely related to bacteria than the algae, they are often included with the algae. Some of the blue-green algae occur as symbionts in lichens. There has been little research on the distribution of this group.

Chroococcales

***Entophysalis conferta* (Kützing) Dr. et Daily**

A thin encrusting brown gelatinous layer on stones in the littoral (Newton, 1931).

L. Foyle - Greencastle on *Halurus flosculosus* 1937/39 (Blackler, 1951: as *Dermocarpa incrustans*).

***Entophysalis deusta* (Meneghini) Dr. et Daily**

synonym *Gloeocapsa crepidinum* Thur.

L. Foyle - Saltpans Rocks 1937/39 (Blackler, 1951: as *Gloeocapsa crepidinum*).

Nostocales

Oscillatoriaceae

***Microcoleus lyngbyaceus* (Kützing) Gomont**

synonym *Oscillatoria corallinae* (Kützing) Gomont

synonym *Lyngbya aestuarii* (Mertens) Liebmann

Filaments (trichomes) usually epiphytic. Probably under-recorded.

L. Foyle - Moville, on *Corallina officinalis* (as *Oscillatoria corallinae*), to Greencastle (as *Lyngbya aestuarii*) at high water mark 1937/39 (Blackler, 1951).

***Schrizothrix rubella* Gomont**

synonym *Phormidium corium* Gomont

Said to be "not uncommon" (Newton, 1931).

L. Foyle - Greencastle on *Halurus flosculosus* 1937/39 (Blackler, 1951: as *Phormidium corium*).

Rivulariaceae

***Calothrix crustaceae* Bornet et Flahault**

Epiphytic on many algae, including *Enteromorpha intestinalis* and *Osmundea hybrida*.

L. Foyle - Moville & Drung to Whitecastle in pools above high water spring tide 1937/39 (Blackler, 1951: as *Calothrix confervicola* and as *Rivularia atra*).

***Rivularia atra* (Roth) Bornet et Flahhault**

Filaments compact, forming lobes up to 4mm in diameter.

L. Foyle - Greencastle to Moville 1937/39 (Blackler, 1951).

Topographical index

All the sites referred to in this flora are listed below using, where possible, the 1: 50000 Ordnance Survey of Ireland maps, Discovery Series (*Suirbhéireácht Ordanáis na hÉireannn*). A six figure grid reference is given in some cases if the record is of a site which can be clearly fixed on the map. Some records are however from islands or bays, such as Aran Island, for which even a four figure grid reference can only indicate the centre of the island or bay. In some references, the site was referred to using latitude and longitude. In such cases the latitude and longitude has been converted to a grid reference to maintain consistency. However, where it is considered advantageous, the full latitude and longitude may also be given. In some cases, the position referred to is in the ocean away from land, the specimen having been collected by diving. In such cases, the site of the record may be given as "near" or "north, south, east or west" of a named land mark. The name of some sites is a local one obtained from a local inhabitant or from other maps and is not to be found on the Ordnance Survey maps. Other names are not to be found on Ordnance Survey maps but their position can be deduced from a publication.

Occasional records outside Co. Donegal may be noted if they are considered to be of interest.

Altacorry Head	Rathlin Island, Co. Antrim.	D1522
Anny Point	west coast of Lough Swilly about 6km north of Rathmullan.	C2933
Aranmore Island, Arranmore or Aran Island (*Arainn Mhor*)	large Island in Dunglow Bay. Not to be confused with the Aran Islands of Co. Galway, the largest of which is now referred to as Inishmore. Aranmore is reserved for the island off the coast of Co. Donegal.	B61
Back Lough Narrows	the narrows at the entrance to Back Lough in Mulroy Bay.	C1735
Ballyhiernan Bay	large sandy bay on north Fanad coast with rocks on both the east and west.	C1745 & C1945
Ballyhoorisky	at entrance to Mulroy Bay.	C1545
Ballyhoorisky Island (Ballywhoorisky)	island near eastern entrance to Mulroy Bay.	C155445

Ballyhoorisky Point or Head (Ballywhoorisky)	headland at eastern entrance to Mulroy Bay.	C155455
Ballymastocker Bay (N.)	at Portsalon near the pier at the northern end of the bay. North Lough Swilly.	C244430
Ballymastocker Bay	large bay on the west shore of Lough Swilly.	C23
Bar Rocks	on Rosguill near entrance to Mulroy Bay.	C138435
Bathouse Rocks	Lough Foyle.	
Belta Rocks (Bob's Pinnacle)	sublittoral rocks in Donegal Bay.	G8168
Black Rock	near Rathlin O'Birne	G4679
Black Rock, St John's Point	near St John's Point, north Donegal Bay.	G7268
Black Rock	near Rathmullan in Lough Swilly.	C2726
Bloody Foreland	northeastern headland of Donegal over 11km north of Bunbeg.	B8234
Brinlack Port	small cove about 4km south of Bloody Foreland in Inishfree Bay.	B8031
Broadwater	widest part of Mulroy Bay.	
Bulbinbeg	Inishowen, about 4km south-east of Malin Head.	C423585
Bullockmore	rocky outcrop south west of St John's Point in Donegal Bay.	G6768
Bunbeg	Inishfree Bay.	B8024
Bunatrahan	rocky shore north of a pier on the southern shore of Donegal Bay.	G837647
Buncrana (*Bun Crannacha*)	town on east coast of Lough Swilly.	C3432

Bundoran (***Bun Dobhráin***)	town on the south shore of Donegal Bay.	G8259
Bunlin Bay	small bay at the very south of Mulroy Bay.	C1828
Campbells Bed	in south Mulroy Bay near Carrowkeel.	C2034
Carnboy	Inishfree Bay. Peninsula north of Donegal Airport.	B7723
Carnagarve	between Greencastle and Moville in Lough Foyle.	*circa* C6238
Carnalough	possibly Cardonagh (*Carn Domhnach*) in the Inishowen peninsula.	C4645
Carrickadda	south-east of Tory Island.	B8844
Carrickabraghy	Doagh Isle, Inishowen.	C3952
Carrickbealatroha	between Aran and Rutland Islands in Dunglow Bay.	B694145
Carrickart	on the western shore of Mulroy Bay.	C131368
Carrigan Head	headland between Muckross and O'Birne in north Donegal Bay.	G5674
Carrowkeel	south Mulroy Bay.	C1932
Caskins	Sheephaven Bay, a local name for a site at the north of Marble Hill Strand.	C067374
Claddaghanillian Bay	North coast of Rosguill peninsula.	C1244
Clare Island	about 2.5km south of Moville in Lough Foyle.	C578362
Coolmore	on southern shore of Donegal Bay.	G860665
Crana River	river at Buncrana in Lough Swilly.	C3432
Cranford (Bay)	in Mulroy Bay about 6km north of Milford.	C1933
Cruit Island	large Island in Dunglow Bay.	B7321

Culdaff	town on the north coast of Inishowen peninsula.	C5350
Culmore	Co. Londonderry at the extreme south of Lough Foyle.	C4722
Dawros Bay	bay at Rossbeg in Gweebarra Bay.	G659966
Deegagh Point	southern Mulroy Bay.	C1933
Devlinmore	on the west coast of Mulroy Bay.	C1736
Doagh Beg	on west coast of mouth of Lough Swilly.	C2545
Doagh Isle	peninsula on Inishowen enclosing Trawbreaga Bay south of Malin Head.	C4151
Doaghmore Strand (or Donaghmore Strand)	strand near eastern entrance to Mulroy Bay.	C1442
Donegal Bay	a "General Area". Large bay in south Donegal.	
Doorin Point	at the end of the Murles Peninsula in Donegal Bay.	G8072
Downies or Downing's Bay (*Na Dúnaibh*)	in Sheephaven Bay on the Rosguill peninsula.	C0938
Drumaweir	Lough Foyle, between Greencastle and Moville.	C6439?
Drumnacraig Bay	bay on the north-east coast of Mulroy Bay.	C1339
Drung	between Redcastle and Whitecastle in Lough Foyle.	C5434?
Dunagree Point	the most eastern point of the Inishowen peninsula, in Lough Swilly.	C683427
Duncap Isle	small island in Sheephaven Bay.	C038404
Dundooan Rocks	north-west coast of Mulroy Bay.	C1241
Dundeau	unlocated site in Mulroy.	

Dunree	site not confirmed, if not the Dunree Headland below.	
Dunree Head (*Cionn an Dúin Riabhaigh*)	headland in Lough Swilly about 9km north of Buncrana.	C2839
Dundooan Rocks	in Mulroy Bay on Rosguill peninsula.	C1241
Dunagree Point	point near entrance to Lough Foyle about 4km north-east of Greencastle.	C683427
Dunglow Bay	a "General Area" on west coast of Co. Donegal.	
Dunmore Head	headland in Gweebarra Bay, about 2km from Portnoo.	B6800
Esky Bay	near Malin Head on the north coast of the Inishowen peninsula.	C415591
Fanad	a "General Area". The large peninsula between Mulroy Bay and Lough Swilly.	
Fanad Head	northern point of Fanad peninsula at entrance to Lough Swilly.	C2347
Fintragh Bay	2–3km west of Killybegs.	G6876
Fort Stewart Ferry	presumed to be at Fort Stewart in the south of Lough Swilly about 37km north of Letterkenny.	C2720
Foyle, Lough	a "General Area". Large lough with Inishowen, Co. Donegal on the west and Co. Londonderry on the east.	
Frenchman's Rock	small island north coast of Rosguill peninsula near Melmore Head.	C116456
Glenbyrnie	Lough Foyle, between Greencastle and Moville.	
Glencolumbkille (*Gleann Cholm Cille*)	a small village in south Gweebarra Bay.	G5285
Gloster Rock	small island close to shore near Malin Beg.	G489793

Go Island (*Oileán Ghabha*)	small island south of Gola Island in Inishfree Bay.	B7625
Gola Island (*Gabhla*)	large Island in Inishfree Bay, about 5km north west of Bunbeg.	B7627
Gola More (or Golamore)	Fanad in Mulroy Bay.	C189415
Gortnalughoge	near the west entrance to Mulroy Bay.	C1342
Gortnatraw Bay	on the south-east coast of Mulroy Bay near Carrowkeel.	C2032
Great Pollet Arch	near the entrance to Lough Swilly on the west coast.	C2445
Greencastle	Inishowen, at entrance to Lough Foyle.	C649341
Greers Island	small island in Mulroy Bay in Fanad.	C183405
Gull Island	one of the Inishtrahull islands	C493655
Gwebarra Bay	a "General Area". West Co. Donegal.	
Gweedore Bay	in Inishfree Bay near Gola Island.	B7926
Horn Head	northern point of peninsula, enclosing Sheephaven Bay on the west side.	C012423
Illancrone Island	small island south of Aran Island in Dunglow Bay.	B6910
Inishbofin Bay (*Inis Bó Finne*)	one of the "General Areas". A large bay around Inishbofin on the north coast of the County.	
Inishfree Bay	a "General Area" on the west coast.	
Inishfree Island	island in Inishfree Bay.	B7624
Inishkeel	island in the sand near Portnoo, can be reached at low tide.	G710998
Inishkeeragh (*Inis Caorach*)	island in Dunglow Bay, south of Aran Island.	B6812

Inishmeal	small island in Dunglow Bay, east of Rutland Island.	B7211
Inishowen	one of the "General Areas". The most northerly peninsula of Ireland, between Loughs Swilly and Foyle.	
Inishtrahull	one of the "General Areas". Islands north of Malin Head.	C484654
Inver Bay	Donegal Bay, the bay to the east of the St John's Peninsula.	
Invermore Bay	bay near the entrance to Mulroy Bay.	C1341
Keadew Bridge	about 10km north of Milford in Mulroy Bay.	C2036
Kilcar	village in north Donegal Bay.	G618762
Kiln Port	eastern shore of peninsula to St John's Point.	G7572
Killybegs	town on north Donegal Bay.	G7176
Kindrum	Mulroy Bay, in Fanad.	C1841
Knox's Hole	north Mulroy Bay on Rosguill peninsula.	C1239
Lackagh Bridge	Sheephaven Bay.	C095310
Lagmore Bay	north Water, Mulroy Bay.	C1840
Limeburners Rock	in Atlantic, more than 3km NW of Melmore Head.	C124502
McSwyne's Bay (M'swyne's Bay)	Donegal Bay, the bay to the west of St John's Peninsula.	G7474
Magheragallon	in Inishfree Bay, about 2.5km north of Bunbeg.	B795259
Malin and Malin Head	the most northern point of mainland Ireland. Inishowen.	C3859

Malin Beg (*Málainn Bhig*)	opposite Rathlin O'Birne, the western point of the county.	G4879
Maiden Rocks	Lough Foyle (site not indicated in Blackler, 1951).	
Mark's Point (1)	Mulroy Bay, about 2.5km north-west of Mark's Point (2).	C1637
Mark's Point, Broadwater (2)	Mulroy Bay, in Broadwater.	C1835
Marnid Point	north shore of Tory Island.	B8547
Meenclady Bay	a small bay in Inishbofin Bay.	B8633
Meenlaragh	village on coast of Inishbofin Bay.	B8833
Melmore Head (*An Meall Mór*)	the most northerly point of Rosguill.	C1345
Middle Island	one of several islands north of Inishowen near Malin Head.	C436603
Middle Sound	waters between Inishkeeragh and Illancrone in Dunglow Bay.	B6911
Millford Port	South of Mulroy Bay.	C1928
Millstone Bay	bay in Mulroy Bay on the Fanad peninsula.	C1538
Moross Castle	on the coast of the large northern inlet off Mulroy Bay in Fanad.	C183388
Moross Channel	Mulroy Bay, Fanad.	C183388
Moross Strand Head	Mulroy Bay, Fanad.	C195384
Moville	Inishowen, village on the east shore of Lough Foyle.	C6138
Moville Bay	bay at Moville, Lough Foyle.	C6138
Muckross Head	north coast of Donegal Bay.	G6173

Mullaghanhardy Point	Mulroy Bay, on the coast of the large northern inlet off the lough.	C188374
Mulroy Bay	one of the "General Areas". The large inlet on the north coast of Co. Donegal.	
Murles and Murles Point	Donegal Bay, near and on the south point of the Murles Peninsula.	G822727
North Deep	Lough Foyle (site not detailed in Blackler, 1951).	
Narrows, The	the narrow straits of Mulroy Bay about 9km north of Millford.	C1835
Pan Bay	near Carrowkeel in the south of Mulroy Bay.	C2032
Pollan Bay	large bay about 9km north-west of Cardonagh, Inishowen.	C3951
Port Kinnagoe	Co. Donegal. Location possibly on the northern shore of Inishowen. Shown on 1: 50 000 Ordnance Map as "Kinnoge".	C6246
Portmore	on one of the islands of Inishtrahull.	C4865
Port-na-Blagh (*Port na Bláiche*)	Sheephaven Bay, "Portnablahy" on OS map. About 2km east of Dunfanaghy.	C038372
Portnagh Rock	rocky outcrop at southern point of the peninsula to St John's Point in Donegal Bay.	G703688
Portnagarribane	near Fanad Head in Lough Swilly.	C227478
Portnagh Rock	near St John's Point, Donegal Bay.	G703 687
Portnalong	near Ballyhoorisky Island at entrance to Mulroy Bay.	C1544
Portnoo	village on the shores of Gweebarra Bay.	G701995
Rathlin O'Birne Island	one of the "General Areas". The most westerly point of the county.	G4780
Rathmullan	town on the west coast of Lough Swilly.	C2927

Ravedy Island	at the entrance to Mulroy Bay, near Melmore Head.	C1345
Ravenscliffe Reef	near Moville in Lough Foyle.	C6138
Redcastle	in Lough Foyle about 7km south of Moville.	C5534
Rinageeragh Point	near Mullaghderg in Inishfree Bay.	B7621
Rinnafaghla Point	the north-western point of the Rosguill peninsula.	C0842
Rinnalea Point	The Rosses, Inishfree Bay.	B748219
Rinnamorreeny	west shore of Tory Island.	B8446
Rolagh	near Kilcar in Donegal Bay.	G6074
Rosgarrow	south Mulroy Bay about 1km from Millford.	C1928
Rosguill	one of the "General Areas". The peninsula between Loughs Sheephaven and Mulroy.	
Rossbeg	in Gweebarra Bay	B6697
Rossnowlagh	south coast of Donegal Bay, near Coolmore.	G8667
Rotten Rock	near Doorin Point on Murles Peninsula in Donegal Bay.	G8072
Rough Island	long island in south Mulroy Bay about 5km north of Millford.	C2030
Rutland South Channel	channel south of Rutland Island in Dunglow Bay.	B707131
St John's Point	southern point of St John's Peninsula, Donegal Bay.	G7069
Saltpans Rock	between Moville and Redcastle in Lough Foyle.	*circa* C5836
Scalpmore	island exposed at low-water in Broad Water in Mulroy Bay.	C1835

Scarony	islands about 2km north of Bulbinbeg	C438608
Scoltmorris	Tory Island.	B845478
Scoltnamaddy	eastern entrance to Mulroy Bay.	C157446
Sheephaven Bay	one of the "General Areas". A large bay on the north of the county.	
Skerries, The	group of small islands about 1.75km north of Portrush in Co. Antrim.	C8-4-
Sladdannavooghog	South of Ballyhoorisky at the eastern entrance to Mulroy Bay.	C1544
Sound, The	the waters between Rathlin O'Birne and the mainland.	C475804
South Channel	Dunglow Bay, channel between Inishcoo and Rutland Island.	B7015
Spike Rock	off east coast of Tory Island.	B880459
Stack, The	near Rathlin O'Birne. Malin Beg Harbour.	G493795
Stookan Rocks	Mulroy Bay near the narrows.	C1935
Stroove	on Inishowen between Greencastle and Dunagree Point.	C6642
Storm Beach	near Moville in Lough Foyle.	C6-3-
Stuaker Bay	Lough Swilly. [site unknown]	
Studdagh Rock	near St John's Point in Donegal Bay.	G7068
Swilly, Lough	one of the "General Areas". Large lough on the north coast.	
Tawny	near Moross Castle in Mulroy Bay.	C1841
Terman (***An Tearmann***)	peninsula in Dunglow Bay about 6km west of Dunglow.	B7110

Tirloughan Bay	near Carrickart in Mulroy Bay.	C1437
Toninishgun Point	Dunglow Bay, point on coast of Rutland Island.	B708149
Tormore (*An Tor Mór*)	east coast of Tory Island.	B878 464
Tory Island	one of the "General Areas". An island off the north-west coast of Co. Donegal.	
Trabeg Bay	Mulroy Bay.	C1837
Tranafaighaboy	near the west entrance to Mulroy Bay.	C1343
Tullagh Bay	bay on the NW coast of Inishowen.	C3649
White Mares Bay	on western coast of Boadwater in Mulroy Bay.	C1836
White Sand Bay (White Strand Bay on Ordnance Survey maps)	in Broad Water of Mulroy Bay.	C1936
Whitestrand Bay	sandy bay south of Malin Head, Inishowen.	C4056
Whitecastle	Lough Foyle, between Quigley's Point and Drung.	C5333
Wyon Point	near Terman in Dunglow Bay.	B7010

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Species index

All genera, species and infraspecific taxa in this account are included in the index. Accepted taxa detailed in this work, and their principal page number(s), are shown in ***bold***. English names are not included.

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SYSTEMATICS AND BIOGEOGRAPHY OF TWO *TRICHOGRAMMA* (HYMENOPTERA: TRICHOGRAMMATIDAE) SPECIES DESCRIBED FROM THE PARISIAN REGION, FRANCE

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Summary

This paper supplies information to improve the definition of two *Trichogramma* species and presents different data about them. The Eurasian *T. cacoeciae*, also recorded in North Africa and North America, required a neotype. A male individual from the Parisian region was designated to represent such a type. Observations made on new samples of the second species, *T. agrotidis*, also from Eurasia, suggested that it has been described with some errors in relation to the male genitalia. The type re-examination (holotype and paratypes) confirmed that some corrections were necessary.

Introduction

Trichogramma are minute egg parasitoids, especially of Lepidoptera. The genus includes numerous species, some of them used in the biological control of various agricultural pests. Two species were poorly defined and the aim of this work was to improve their definition and to present different data about them from the literature.

The thelytokous species *Trichogramma cacoeciae* was described without type, as *T. cacaeciae*, by Marchal in 1927 from parasitoids collected on Tortricidae eggs infesting Rosaceae, especially apple trees, in the Parisian region. This species has a wide distribution, including Europe, Asia, North Africa (Pintureau, 1997; Pintureau *et al.*, 1999) and North America (Pacific Northwest in USA) (Pinto, 1998). Pinto (1998) redescribed the species from French and American material but did not designate a type. In *Trichogramma* systematics, "most controversy is due to the absence or inadequacy of type material" (Pintureau and Pinto, 1996), that requires "the designation of neotypes based on male specimens collected at or near

the type localities" (Pintureau and Pinto, 1998). A neotype for *T. cacoeciae* is thus designated in the present paper to clarify the taxonomic status of the species.

The bisexual species *T. agrotidis*, limited to Eurasia, was described by Voegelé and Pintureau (1982) from parasitoids collected on Noctuidae eggs infesting Polygonaceae, also found in the Parisian region. Nevertheless, the genitalia were poorly illustrated. The study of another population from Switzerland, together with re-examination of the types, indicated that some corrections were necessary.

Systematics and biogeography of *Trichogramma cacoeciae*

History and synonyms

Pintureau (1987) recognized *T. flavum* Marchal and the "thelytokous form" of *T. embryophagum* (Hartig) (Quednau, 1960; Sorokina, 1977a, b) as a synonym of *T. cacoeciae*. The species *T. flavum* is thelytokous, sympatric to *T. cacoeciae*, and differentiated from the latter only by a small variation in colour. Pintureau (1987, 1990) concluded, also, that *T. embryophagum* was synonymous with *T. cacoeciae*, the first species being restricted to its "thelytokous form", but this was a misidentification (Pintureau, 1997). *Trichogramma embryophagum* corresponds, in fact, to the "bisexual form" of Sorokina (1977a, b). Pintureau (1990, 1997) added *T. telengai* Sorokina and *T. neustadt* Xie and Zhu to the list of synonyms.

The species was illustrated by Marchal (1936), Hochmut and Martinek (1963), Sorokina (1977a, 1987), Sugonjaev and Sorokina (1978), Zerova *et al.* (1992), and Pinto (1998). It is the only thelytokous species not infected by endosymbiontic bacteria of the genus *Wolbachia* (Stouthamer *et al.*, 1990; Pintureau, 1994a, 1997; Pinto and Stouthamer, 1994).

Neotype designation

The species was described from Antony (French Département of Hauts-de-Seine, near Paris) (Marchal, 1927). Pintureau (1987) proposed a lectotype, a detailed drawing of a female supplied by Marchal (1936). Nevertheless, the suitability of this type (a drawing and, moreover, a female) is questionable and its designation is consequently invalid. A neotype had to be chosen from a known population in the Parisian region. A male was preferable because this sex obviously shows more characters of systematic interest in recognizing the species.

Neotype: 1 male from strain 101 collected in August 1976 on *Laspeyresia pomonella* (L.) (Lepidoptera: Tortricidae) eggs on an apple tree, in Guyancourt (Département of Yvelines), 17km west of Antony. The strain was reared on *Ephestia kuehniella* Zeller eggs (Lepidoptera: Pyralidae). In this thelytokous species, rare males appear only sporadically. To collect some males and select one to represent an appropriate neotype, numerous individuals, in the thousands, have been observed during five generations of the strain 101. Figure 1 shows the main morphological characteristics of the neotype.

A total of five males and 17 females from the same culture as the neotype were mounted and observed. The type was deposited in the Museum national d'Histoire naturelle de Paris (MNHN). Individuals from the same culture were deposited as follows: three males and nine females in the MNHN, and two males and eight females in the collection of the UMR INRA/INSA de Lyon (BF2I).

Variations

Individuals from North America (Pinto, 1998), Denmark (material sent by J. C. Monje in April 1999) and England (Fursov and Pintureau, 1999a, b) show longer setae on the male flagellum than the French specimens. Pinto (1998) indicated 2.35 ± 0.15 for the ratio of the length of the longest flagelliform seta to the width of the flagellum (FSL/FW), and I calculated 2.5 and 2.6 on two individuals from California and Washington states (material sent by J. D. Pinto in 2000). In the culture 101 of the neotype, FSL/FW is generally below 2: 1.6 to 2.2 with a mean of 1.9 (n=5).

On the other hand, the ratio of the ovipositor to hind tibial length (OL/HTL) is similar in USA and France. Pinto (1998) indicated 1.04 ± 0.02 and I calculated 1.07 and 1.11 for the OL/HTL of American females, *versus* 1.03 to 1.08 with a mean of 1.05 (n=5) in the culture of the neotype.

Classification

Pintureau (1987, 1990, 1993a, b, 1994b, 1997) and Pintureau and Babault (1988) classified the species in the *pretiosum* group. Species of this group are included in the *exiguum* section of Pinto (1998).

Distribution

In Europe, *T. cacoeciae* was collected in Byelorussia, Bulgaria, the former Czechoslovakia, Denmark, Estonia, France, Germany, Greece, Italy, Latvia, Lithuania, Moldavia, the Netherlands, Poland, Russia, Switzerland, Ukraine and the former Yugoslavia (Pintureau, 1987, 1990, 1993b, 1997; Pintureau and Keita, 1989; Jager *et al.*, 1997; Pintureau *et al.*, 1999). In Asia, the species was listed from the People's Republic of China, Kazakhstan, Kirghizia, Turkey and Uzbekistan (Pintureau, 1987, 1993a, 1997). In Africa, it is known from Morocco (Pintureau, 1987, 1993a, 1997; Pintureau and Babault, 1988; Bourarach, 1988). In North America, the species has only been recorded in the two states of California and Washington (Pinto, 1998).

Two new countries were recently added to the distribution of *T. cacoeciae*. Pintureau and Babi (in press) recorded the species in Syria, and Fursov and Pintureau (1999a, b) in England, more precisely in the type locality of *T. evanescens* Westwood.

Systematics and biogeography of *Trichogramma agrotidis*

Redescription

The species was described in 1982 from Versailles (French Département of Yvelines, near Paris). A study of Swiss individuals, collected by B. P. Suverkropp in summer 1995, on Nymphalidae eggs laid on grey willow *Salix cinerea* L. and silver birch *Betula pendula* Roth (Pintureau and Delobel, 1997) suggested that there were some errors in the illustrations of the male genitalia by Voegelé and Pintureau (1982) and later by Sorokina (1993). In 1982, the holotype and allotype were deposited in a southern France laboratory (INRA-Antibes) and paratypes in the MNHN. Nevertheless, the holotype and allotype were finally entrusted to the MNHN on 23 October 1992 (in fact in September 2002 after a long stay in California). Only one slide bears the holotype (one male) and the allotype (one female). Among the two slides bearing the paratypes, one with two females and one male is in good condition and the other, with six females and four males, is in a very poor condition (re-mounting will be necessary if the need for precise observation arises). The type re-examination (holotype and one male paratype) confirmed the existence of some errors on the genitalia illustration published in 1982.

According to Voegelé and Pintureau (1982), the dorsal lamina (DLA) only just reaches the

base of the volsellae (VS), and the parameres (PM) and VS are very elongated. In fact, the DLA is longer and the PM are slightly shorter. Figure 2 shows genitalia of the well preserved male paratype and of a male from the Swiss population studied. The holotype shows the volsellae folded back and this may be the cause of the errors. On the other hand, the male antennae were correctly illustrated by Voegelé and Pintureau (1982).

The species is generally bisexual but thelytokous populations, at least in part, have been recorded in France and Eastern Russia (Pintureau, 1987, 1994a). *Wolbachia* are probably implicated in this mode of reproduction (Pintureau *et al.*, 2002).

Classification

Pintureau (1987, 1990, 1993a, b, c, 1994b) and Pintureau and Delobel (1997) classified the species in the *minutum* group. Species of this group are included in the *exiguum* section of Pinto (1998).

Distribution

For a long time, *T. agrotidis* was only known from France (Pintureau, 1987, 1993c, 1994a), Bulgaria (Pintureau, 1990) and Eastern Russia (Pintureau, 1987, 1993b). The species was then recorded in Switzerland (Pintureau and Delobel, 1997). It is thus restricted to Eurasia.

Conclusion

The precise definition and description of species are important in determining the egg parasitoids that can be used in biological control. The concept of *T. cacoeciae*, a thelytokous species present in Eurasia, Africa and America and used in some countries to control several tortricid pests of trees (Barnay *et al.*, 1999; Hegazi and Khafagi, 2001), is now stabilized by a neotype designation. The description of *T. agrotidis*, a species that is often bisexual and only present in Eurasia, is improved by the present work. An easier identification will perhaps encourage its use in solving some agricultural problems.

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FIGURE 1. Neotype of *Trichogramma cacoeciae* (male). A: antenna; B: genital capsule, dorsal view; C: genital capsule, ventral view. Scale bar=0.05 mm.

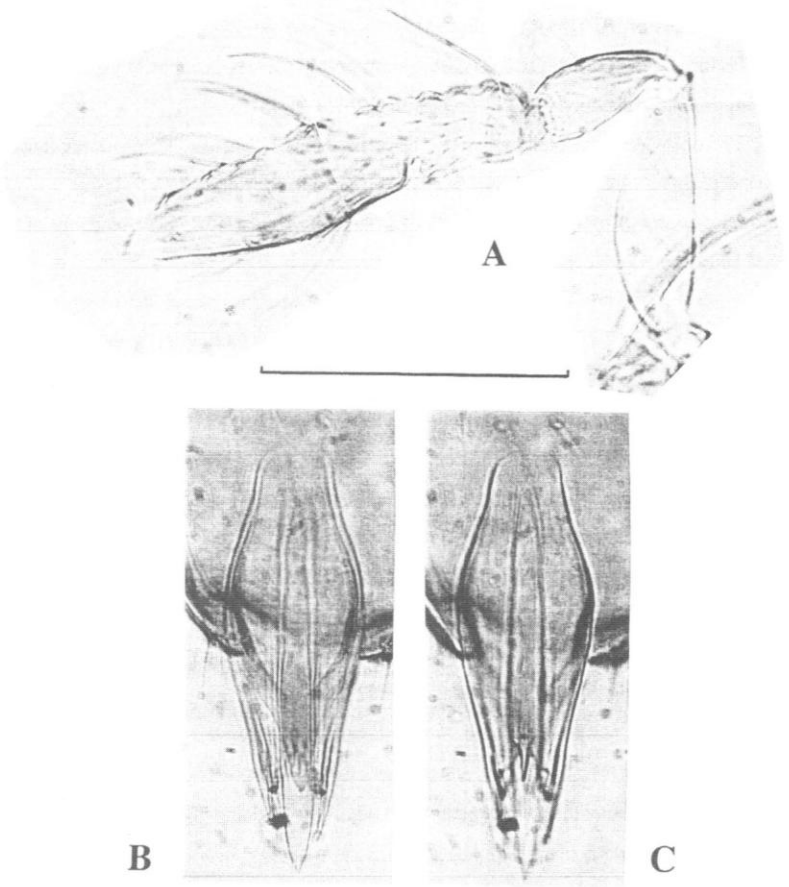
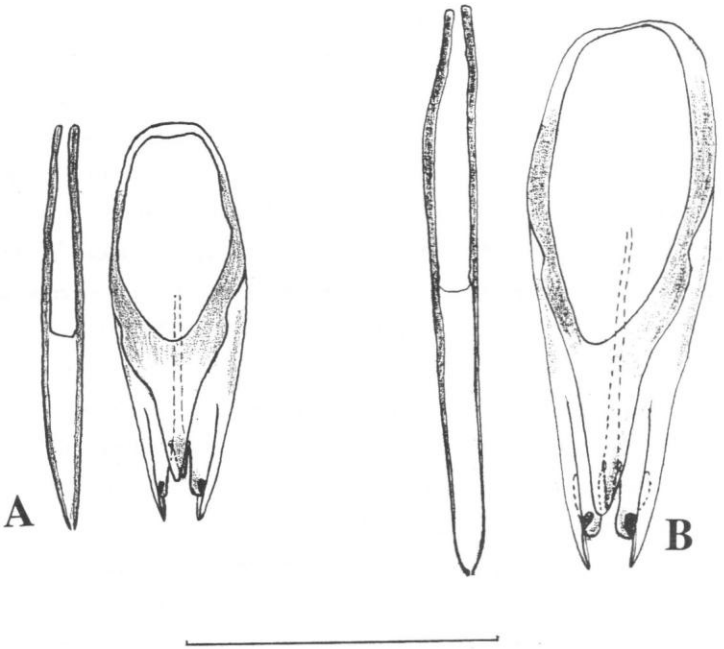


FIGURE 2. Male genitalia of *Trichogramma agrotidis* (dorsal view). A: one paratype deposited in MNHN; B: an individual from a Swiss population. The aedeagus were separated from the genital capsule. Scale bar=0.05 mm.



Bull. Ir. biogeog. Soc. No. 27 (2003)

THE ZEBRA MUSSEL *DREISSENA POLYMORPHA* (PALLAS) EXTENDS ITS RANGE WESTWARDS IN IRELAND

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Introduction

The zebra mussel *Dreissena polymorpha* (Pallas) is native to the wide rivers draining to the Caspian and Black seas and, at one time, the Aral Sea in Eastern Europe before salinities increased. There were several separated populations and, from these, different forms emerged. One form, *Dreissena polymorpha polymorpha* (Pallas) has spread to northern and central Europe since the late 1700's, following the building of canals connecting different navigable rivers. Their free-swimming larvae were distributed both by downriver current movements or as fouling attaching to the hulls of craft used in commerce, thereby enabling its establishment in the Curonian Lagoon in the Baltic Sea (Olenin *et al.*, 1999). Zebra mussels can tolerate slightly brackish water but their spread to coastal marine conditions elsewhere on the northern coast of Europe by dispersal of larvae at sea is unlikely. Their spread to several North Sea ports resulted from exports of damp timber that had been held in brackish water before being exported from the Baltic Sea region (Kinzelbach, 1992). The first recognised account of the zebra mussel in Britain was from the Thames River in 1824 and the species had probably become established some years earlier than this (Kerney and Morton, 1970). Almost 170 years later, it became established in Ireland following imports of leisure craft from Britain. These craft were carried on trailers by land and ferry and then re-immersed in Irish lakes in 1994 or earlier and had zebra mussels attached to their hulls (Pollox *et al.*, 2003). The species appears to have expanded its range upriver from Lough Derg attached as fouling on leisure craft (Minchin, 2000). In or before 1996, it had become established in Lough Key (Lucy, in press; Lucy and Sullivan, 2001). In Lough Erne, specimens of the 1996 year class were found (Rosell *et al.*, 1999). These may have originated from the Shannon Navigation carried on the hulls of leisure craft that passed through the Shannon-Erne Waterway, a canal reopened in April 1994. Although fouled craft were found on the Grand Canal from 1997 and in the Barrow Navigation

from 1998, there is no indication of any local establishment at this time. Populations subsequently appeared in Tullamore Harbour, colonised by 2000 (Minchin *et al.*, 2000) and in Ringsend basin, by 2001 (Minchin *et al.*, 2001). This account reports the spread of the zebra mussel to smaller lakes in Co. Clare. These occur on three small river systems outside of Ireland's main navigation system.

Methods

In January to May 2002, thirty-one lakes were examined in Cos Clare and Galway. Collections were made by:- **(1)** hand collections of drift material washed ashore (reeds, rubbish, waterlogged branches); **(2)** scraping vertical surfaces, i.e. of poles supporting angling stands and boat berths, using a 15cm blade with pocket net on a 4m pole; **(3)** raking the lake or river bottom for plant material, stones, *Anodonta*, branches, reed stems and rubbish and **(4)** examination of boats or other objects that may have been immersed and then beached on shores.

Samples of the retrieved zebra mussels were measured for shell length. Size frequency distributions from these measurements aided interpretation of the year classes present. Estimates of relative abundance were based on the degree of infestation of the objects retrieved. Where scrape samples were obtained, estimates of relative abundance were made.

Results

A total of six lakes of the thirty-one examined were found to have zebra mussels present (Table 1). Living *Anodonta* sp. were present in two of these lakes. Zebra mussels were found byssally attached to buoys, stems of *Phragmites australis* (Cav.) Trin. ex Steudel beached on shores, submerged branches, rhizomes, stems and leaves of *Nuphar lutea* (L.) Sm., the shells of living and dead *Anodonta* sp., discarded plastic and wooden supports of fishing stands. The infested lakes are from three separate river catchments, draining either into the Fergus Estuary or the Shannon River.

Zebra mussels ranged in size from 2-25mm in Lough Avoher; 1-19mm in Clonlea Lough; 9-23mm in Cullaunyheeda Lough; 3-23mm in Doon Lough (lower); 1-27mm in Kilgory Lough and 1-23mm in Rosslara Lough. Shell colour banding was distinct in specimens from Clonlea,

Cullaunyheeda, Doon and Kilgory Loughs but poor in Avoher and Rosslara Loughs. All in the last two waters had brown shells but those at Rosslara were dark brown.

Discussion

Zebra mussels continue to expand their range in Ireland. Of thirty-one sampled loughs, six were found to be infested (*circa* 20%). Lakes < 10 hectares surface area are capable of maintaining populations. Since the sampling in this study was based on a rapid assessment of each lough, some of the lakes that were sampled and provided no evidence of infestation, may be infested, but at a low level. However, the study demonstrates that the spread of zebra mussels to smaller lakes, outside of the main navigation, has taken place and it is likely that other lakes elsewhere in Ireland have already become infested.

The size distributions indicate that, in all of the lakes, there were two year classes representing settlements in 2000 and 2001. However, Mr Nial O'Donnell, who lives beside Doon Lough, remembers in 2000 retrieving a fishing lure with large zebra mussels attached that could mean that a population may have been present since 1998. Since zebra mussels are thought to survive about two years, retrospective calculations of the years of settlements are limited.

The presence of zebra mussels in Co. Clare lakes will almost certainly result in alterations of trophic flow. The colonisation of living *Anodonta* populations is likely to lead to population declines or extinctions of this unionid. Water clearances are also likely. Increases of sedimentation and impacts to the benthos are expected, with rises in the abundance of scavenging Crustacea and Nematoda in interstitial accumulations of faeces and pseudofaeces expelled by the dense clusters of zebra mussels.

Larval transport to downstream lakes *via* interconnecting streams and rivers is possible. Evidence from North America indicates zebra mussel survival declines with downriver transportation over tens of kilometres (Hovarth *et al.*, 1996). Larvae produced in Doon Lough could be carried to Castle Lough *via* Ballymulcashel Lake (Figure 1) and *via* the small interconnecting Owenogarney River. Here, the water flow in late summer may be low, a time when larval abundance is greatest. The distances of transmission are small but the effects on larval survival in small rivers remains unstudied and may be greater than indicated by Hovarth

et al. (1996). Nevertheless, some larval transmission may be expected to descend to Castle Lake, with colonisation taking place at a later time of year when the water levels in the river are higher. This is provided that conditional other vectors, such as transmission with fouled angling boats, have not been operating. It is probable that colonisation of Castle Lake will take place and, once this happens, there may be difficulties in the supply of water with fouling of abstraction pipes and possible blockages leading to discontinuity of supply and tainting of water, unless remedial action is taken.

Acknowledgements

The Shannon Regional Fisheries Board supported this work. The assistance in the field of Mr Michael Cleary and for his helpful advice is gratefully acknowledged. I thank Mr Nial O'Donnell for his comments on the possible earlier infestation in Lough Doon.

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FIGURE 1. Lakes on the Owengarney River system showing those examined (including infested ones). The examined lakes are shown in colour:- blue indicating absence and yellow indicating presence.

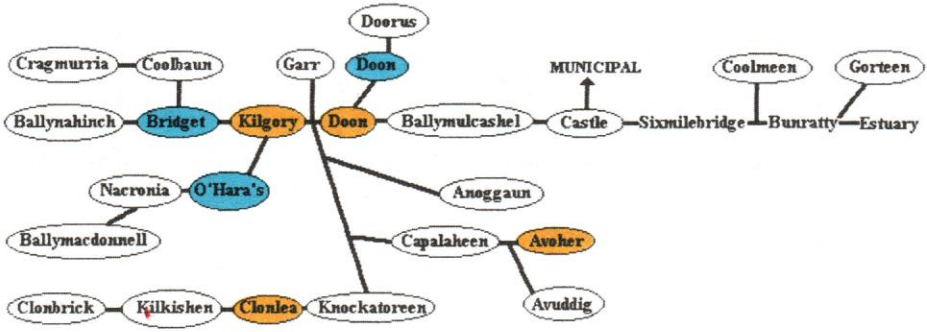

TABLE 1. Lakes visited and infestation status.

Lough	Irish Grid Reference	Boat access	Angling Competitions	Zebra mussels	Age classes	Status	Comment
Avoher	R526-740	Yes	Yes	Yes	2	Abundant	Established, evidence of 'carpeting'
Ballicullinan	R293-862	Yes	Yes	No			
Ballyallia	R346-808	Yes	Yes	No			
Ballynakill	R469-960	Yes	Yes	No			Shallow lake
Bridget	R563-803	Yes	Yes	No			
Bridget	R563-803	Yes	Yes	No			
Bunny	R374-963	Yes	No	No			Clear water with maerl, shallow lake
Clonlea	R511-734	Yes	Yes	Yes	2	Common	Probably established
Cloondanagh	R502-829	No	No	No			
Cloondoorney	R490-824	Yes	No	No			
Cullaun	R319-905	Yes	Yes	No			Clear water with maerl
Cullaunyheeda	R477-749	Yes	Yes	Yes	2	Abundant	Established, evidence of 'carpeting'
Cutra	R486-986	Yes	Yes	No			Shallow lake
Doon (lower)	R548-734	Yes	Yes	Yes	2	common	Undergoing expansion, living *Anodonta*
Doon (upper)	R559-744	Yes	No	Yes			Living *Anodonta*
Dromore	R553-836	No	No	No			
Dromore	R353-862	Yes	Yes	No			Clear water
Finn	R433-703	Yes	No	No			Shallow, limestone lake
George	R336-906	Yes	No	No			Shallow lake, clear water
Graney	R565-907	Yes	Yes	No			pH may be low
Graney	R568-906	Yes	Yes	No			pH may be low
Graney	R563-931	Yes	Yes	No			pH may be low
Inchicronin	R403-870	Yes	No	No			
Inchiquin	R274-894	Yes	No	No			maerl
Iscudda	R418-906	Yes'	No	No			
Kilgory	R539-781	No	Yes	Yes	2	Abundant	Established, evidence of carpeting
O'Hara's	R550-786	No	No	No			
Rathlaheen	R435-677	Private	No	No			Shallow, limestone lake
Rinroe	R334-912	No	No	No			Small pond
Rosslara	R530-825	Yes	No	Yes	2	Common	Population expanding, living *Anodonta*
Shandangan	R473-722	No	No	No			pH may be low, surrounding marsh
Teereen	R461-717	No	No	No			
Toole's	R311-897	No	No	No			Connected to Atedaun Lough in winter
Tullymacken	R371-922	Yes	Yes	No			Shallow lake

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FIRST RECORD OF *OPHRYDIUM VERSATILE* (MÜLLER), A COLONIAL PERITRICH CILIATE (PROTISTA), FROM CLARE ISLAND, CO. MAYO, IRELAND

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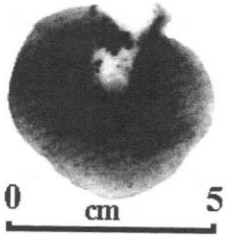
Introduction

Ophrydium versatile (Müller) is a eukaryotic single-celled protistan peritrich ciliate (Class Oligohymenophora) that typically occurs in gelatinous colonies ranging in size from under 2.0cm to over 15cm across (Duval and Margulis, 1995). Occasionally termed "green jelly-balls", colonies occur in the photic zone of shallow oligotrophic water-bodies and may be free-floating, attached to aquatic plants or on the surface sediment (Eaton and Carr, 1980). Small colonies are almost spherical, while the larger colonies have an irregular spherical form or may be flattened and kidney or doughnut shaped. Colonies often contain a central region of gas and water. When removed from their natural habitat in water and in the absence of a supporting network, the colony collapses and loses its spherical form.

Ophrydium versitale (Müller) in Ireland

Published reports of occurrences of *O. versitale* in Ireland are limited to records from Lough Ree (Eaton and Carr, 1980). More recently Trodd (1998) and Murphy (2001) reported on its occurrence in wetlands and lagoons of the Turraun peatlands, Co. Offaly. During ongoing investigations on the Chironomidae of surface waters on Clare Island, Co. Mayo, in connection with the Royal Irish Academy's "New Survey of Clare Island", colonies of *O. versitale* (Müller) were observed on 21 August 2002, free-floating amongst stems of emergent vegetation, in a shallow littoral region along the southern shoreline of Creggan Lough (L689857) in the Townland of Lecarrow (Fig. 1). This constitutes the first record of the taxon from the island and adds to knowledge of Irish biodiversity.

FIGURE 1. *Ophrydium versitale* showing "doughnut" shape of colony from Creggan Lough, Clare Island, Co. Mayo, photographed on 21 August 2002.



Comments on the biology of *O. versitale*

Each *Ophrydium* colony consists of numerous individual protozoan zooids, up to 600μm long when fully extended but only 200μm when contracted, embedded in hexagonally shaped chambers oriented perpendicular to the periphery of the gelatinous matrix and anchored to the gel matrix by means of a stalk (Duval and Margulis, 1995). Individual zooids feed by a buccal apparatus composed of two spirally arranged rows of cilia which project on the periphery of the colony and create a current of water to direct and trap bacteria, fungi, protozoa and algae into the cytostome which are then digested (Goff and Stein, 1981).

A number of different organisms appear to be associated with *O. versitale*. Colonies derive their greenish hue from the presence of an alga (*Grasiella* sp.) in an endosymbiotic relationship with the zooids (Duval and Margulis, 1995). Since *Ophrydium* only occur in the photic zone of water bodies and the zooids are positioned in the outer layers of the gel, the endosymbiotic zoochlorellae may receive light for photosynthesis while they obtain carbon dioxide from zooid respiration. According to Sand-Jensen *et al.* (1997), this symbiotic photosynthesis produces sufficient carbon to support the growth, respiration and the substantial carbon content of the colony jelly whereas particle filtration of the zooid ciliates presumably supplies the nutrient for net growth of the assemblage.

Duval and Margulis (1995) examined *O. versitale* colonies from water bodies in two bog-

lands in Massachusetts, U.S.A, and found a range of associated organisms, including large rod-shaped bacteria and spirochetes, filamentous and coccoid cyanobacteria, diatoms and other protists (cilates, mastigotes, euglenids, chlorophytes and heliozoa). Diatoms occur in high numbers inside the gel masses and potentially may contribute to gel formation since species of *Nitzchia*, which constitute the greater proportion of diatom mass, produce gelatinous tube-like strands. Animals within the gel matrix included rotifers and nematodes, while copepods and cladocerans were occasionally observed in the water reservoir of larger colonies. In recent studies on colonies found in lagoons of the post peat-harvested wetlands of the Turraun boglands, Co. Offaly, chydorid cladocera and chironomid larvae were observed within the gel matrix and the inner water reservoir of the colonies (Trodd, 1998). Murphy (2001) examined 165 colonies and found that 60 (36.6%) contained chironomid larvae from eight different genera, some of which had ingested *Ophrydium* gelatinous matrix material. However, while many of the above associations are obligatory, Murphy (2001) considered the observed association between chironomid larvae and *Ophrydium* to be facultative.

Acknowledgement

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A SURVEY 0F WIDESPREAD RESIDENT BUTTERFLIES IN COUNTY DONEGAL, IRELAND

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Introduction

These butterflies have commonly occurring larval food plants such as grasses and nettles or make use of several different plants. They also include many of our hardy butterflies, which can live in a wide variety of damp and dry habitats. In Donegal, there are eleven such species. There are four whites: Green-veined White, Large White, Orange Tip and Small White. There are three browns: Meadow Brown, Ringlet and Speckled Wood. Two, large colourful species (Nymphalidae), dependent on nettles as their larval food and which over-winter as adults: Peacock and Small Tortoiseshell. Lastly, there are the two small species (Lycaenidae): Common Blue and Small Copper. Most are easily recognized and highly visible, which, together with their large populations, results in them being among the most frequently recorded butterflies. However, two of them are less often recorded. The Small White may often be mistaken for the more common Green-veined White, and the Small Copper can be easily missed due to its small size and rapid flight.

Period of survey and sources of records

The records referred to in this report were obtained during recent surveys. Firstly, there was the 1995-1999 Butterfly Conservation (UK) Butterflies for the New Milennium project (BNM), which was coordinated in the Republic of Ireland by the Dublin Naturalists' Field Club (DNFC). Subsequent surveys were carried out in 2000, 2001 and 2002 and coordinated by Bob Aldwell.

TABLE 1. Summary of results for Donegal widespread resident butterflies.

Species	1995-2001 10km square records	New 10km square records in 2002	Total of Donegal 10km square records
Common Blue	37	02	39
Green-veined White	74	01	75
Large White	40	00	40
Meadow Brown	65	06	71
Orange Tip	72	00	72
Peacock	72	02	74
Ringlet	54	08	62
Small Copper	34	00	34
Small Tortoiseshell	69	01	70
Small White	37	05	42
Speckled Wood	63	01	64

Overview of the individual species

Common Blue (*Polyommatus icarus* (Rottemburg))

National and regional distribution in 10km squares: Republic of Ireland (DNFC survey) 332; Northern Ireland 82 10km squares; Donegal 39 10km squares, 2 new squares in 2002.

Distribution and habitat: the Common Blue is present in most coastal 10km squares in Donegal. It occurs in nearly all dune systems as well as some under-cliffs and bog roads, especially where Bird's-foot-trefoil (*Lotus* spp) is plentiful. It is present on Aranmore and Tory islands. It appears much less commonly inland, having been so far only recorded on eight inland 10km squares in Donegal. Its main larval food plant, Bird's-foot-trefoil, seems to be more widespread than the butterfly. At most sites its numbers vary from a handful to a few dozen. New 2002 10km square records were C10 and C54.

Status: although the Common Blue remains widespread it does not appear to be as numerous around the coast in Donegal as was the case in the 1970s and 1980s (Ralph Sheppard, *pers. comm.*). Considerable numbers of August and even some September sightings of the Common Blue strongly suggest the species is double brooded at least in parts of Donegal, although the numbers in the second brood appear much less than in the first brood.

Potential threats: intensive grazing by sheep of some dune systems, especially in north Donegal, poses the greatest threat to this butterfly.

Future recording: a few coastal 10km squares need to be checked, especially C63, C64, and G77. The situation inland still needs to be surveyed systematically.

Green-veined White (*Pieris napi* (L.))

National and regional distribution in 10km squares: Republic of Ireland (DNFC survey) 729; Northern Ireland 165 10km squares; Donegal 75 10km squares, 1 new square in 2002.

Distribution and habitat: the Green-veined White is the most widespread, common and numerous butterfly species in Donegal. The plentiful damp grassland and boggy pastures of the county provide ideal conditions for this species. Indeed, they are a spectacular sight in favourable areas, where in mild weather dozens and even hundreds may be seen hovering a foot or two above the ground. It has been recorded on all full 10km squares in the county and on Aranmore and Tory islands. It only remains to be recorded on three partial 10km squares, which consist of limited areas of exposed north facing headlands. The new 2002 10km square record was G75, only a very small part of which is in Donegal.

Status: the Green-veined White is doing very well in Donegal and is fully maintaining its position.

Potential threats: this is one of the most hardy of Irish butterflies and is unlikely to be seriously affected by human activities in Donegal.

Future recording: the Green-veined White remains to be recorded on only three 10km squares in Donegal, B94, C04 and G59 as well as the Donegal portion of trans-border 10km square H28.

Large White (*Pieris brassicae* (L.))

National and regional distribution in 10km squares: Republic of Ireland (DNFC survey) 456; Northern Ireland 106 10km squares; Donegal 40 10km squares. No new squares in 2002.

Distribution and habitat: the Large White is widely distributed in Donegal but nowadays is numerous only in a few localities, such as Aranmore Island. It has been located on most coastal 10km squares and on Tory Island. It is present in Inishowen and has been recorded on eleven inland 10km squares and also on three transborder squares in Fermanagh and Tyrone. It breeds mainly on cabbages and nasturtiums.

Status: the Large White is dependent to a significant extent on cultivated plants for its larval food. The reduction in the number of vegetable plots and the use of insecticides appear to be the main causes of reduced numbers of this butterfly in Donegal.

Potential threats: further reductions in the numbers of vegetable plots and gardens with abundant nasturtiums are the most likely threats to this species in Donegal. It is the only butterfly that could be considered a pest species in Donegal.

Future recording: systematic checking is needed of the nearly 50% of 10km squares in Donegal where the Large White has not been recorded in recent years. Concentration on suitable vegetable plots and gardens with nasturtiums, including checking for ova and larvae, is likely to be a productive surveying approach.

Meadow Brown (*Maniola jurtina* (L.))

National and regional distribution in 10km squares: Republic of Ireland (DNFC survey) 565; Northern Ireland 131 10km squares; Donegal 71 10km squares, 6 new squares in 2002.

Distribution and habitat: the Meadow Brown is widespread and common throughout Donegal. It has been recorded on most 10km squares and occurs on Aranmore and Tory islands. It is found in dry and damp habitats. New 2002 10km square records were C20, C22, C52, G98, H06 and H17.

Status: the Meadow Brown retains its position as the fourth most frequently recorded butterfly in Donegal. However, changes in recent decades from late single crop hay to multi-crop silage and the loss of semi-natural meadows are likely to have reduced overall numbers in the county.

Potential threats: despite the changes in grass harvesting, the Meadow Brown is unlikely to be seriously threatened in Donegal.

Future recording: a few 10km squares, mostly in north Donegal, still remain to be checked; B94, C13, C30, G59, H18 and H28.

Orange Tip (*Anthocharis cardamines* (L.))

National and regional distribution in 10km squares: Republic of Ireland (DNFC survey) 536; Northern Ireland 150 10km squares; Donegal 72 10km squares, no new squares in 2002.

Distribution and habitat: the Orange Tip is very widespread in Donegal and has been recorded on all full 10km squares in the county and on Aranmore Island. Lady's Smock (Cuckooflower) (*Cardamine pratensis*), its main larval food plant in Donegal, is plentiful in most of the county.

Other plants used include Dame's Violet (*Hesperis matronalis*) and locally Garlic Mustard (*Alliaria petiolata*), as east of Ballyshannon.

Status: the Orange Tip appears to be maintaining itself well in Donegal. In the more exposed hilly areas it is less numerous and tends to be confined to such situations as local, sheltered damp hollows and along roadside drains containing Lady's Smock. It is the third most recorded butterfly in Donegal in terms of 10km squares. However, it should be kept in mind that part of the reason for the large number of records for the Orange Tip may be the ease of finding its ova and larvae.

Future recording: the Orange Tip has yet to be recorded on Tory Island during the current surveys. It also is missing from part 10km squares B94, C04, G47, G59 and G75 and the Donegal portions of transborder squares H18 and H28.

Peacock (*Inachis io* (L.))

National and regional distribution in 10km squares: Republic of Ireland (DNFC survey) 512; Northern Ireland 132 10km squares; Donegal 74 10km squares, 2 new squares in 2002.

Distribution and habitat: in recent years, the Peacock has been widespread and often common throughout Donegal, in coastal and inland districts. It is to be found in most habitats, including dunes and exposed hillsides. Indeed, the larvae may be found on clumps of nettles (*Urtica*) close to the sea and far removed from any wood, with successful breeding taking place even in north Inishowen and Aranmore. The conspicuous nature of the adults and the shining black larvae make the Peacock highly visible and may in part explain why currently it is the second most commonly recorded butterfly in Donegal. It has increased greatly since the 1980s when it almost died out in the county (R. Sheppard, *pers. comm.*). The two new squares in 2002 were part-squares G75 and H16.

In 2002, the Peacock continued to be widespread but the numbers of specimens were significantly down on recent years in most parts of Donegal. An exception was in the gardens at Salthill House, Mountcharles, where nineteen were recorded in an hour on 20 September during the exceptionally fine weather that month.

Status: its range and numbers increased significantly in the 1990s, in part due to more favourable weather, as well as aided by new forestry plantations and plentiful large nettle clumps associated with manure pits, septic tank percolation areas and compost heaps.

Potential threats: destruction of big nettle clumps is the main human threat to the species.
Future recording: gaps include 10km squares B94, C14, C22 and C52 and the Donegal portions of trans-border 10km squares H06 and H28.

Ringlet (*Aphantopus hyperantus* (L.))

National and regional distribution in 10km squares: Republic of Ireland (DNFC survey) 426; Northern Ireland 133 10km squares; Donegal 62 10km squares, 8 new squares in 2002.
Distribution and habitat: the Ringlet is widespread and locally common in Donegal. Current records show it present in most 10km squares in the south and west of the county. It has been recorded on eleven 10km squares on Inishowen but has not recently been recorded on Tory Island. The many areas of damp grassland in Donegal are very suitable for the Ringlet. It appears however to require rather sheltered locations. The Ringlet tends to do well in damp years such as 2002 and there were eight new 10km square records during the year. New 2002 10km square records were B61 (Aranmore Island), B92, B93, C20, C35, G99, H06 and H17.
Status: the Ringlet is maintaining its position in Donegal and is at present the seventh most recorded resident butterfly in the county. It is likely to be found on most 10km squares on which it has not yet been recorded, provided there is adequate shelter present.
Future recording: The following 10km squares need to be checked: C14, C22, C30, C54, C55, G48, H16, H18 and H28.

Small Copper (*Lycaena phlaeas* (L.))

National and regional distribution in 10km squares: Republic of Ireland (DNFC survey) 254; Northern Ireland 107 10km squares; Donegal 34 10km squares, no new squares in 2002.
Distribution and habitat: the Small Copper records for Donegal show it with a strong coastal bias. However, the eight inland 10km squares on which it has been recorded in the county together with several old records and the numerous inland records from other parts of Ireland strongly suggest that the Small Copper will be recorded on more inland 10km squares in Donegal. It has been recorded on Aranmore and Cruit islands and on seven 10km squares in Inishowen. The species is often numerous at some dune sites (e.g. Cruit Island, Murvagh and Sheskinmore) and also some warm south facing hillsides and re-vegetated quarries. The Small Copper did very poorly in Donegal in 2002, being recorded on only nine 10km squares and there were no new squares recorded for the species.

Status: as already stated, the Small Copper is very likely present on more 10km squares than is presently shown. Sorrel (*Rumex*), its main larval food plant, is plentiful in the county.
Potential threats: locally, intensive sheep grazing may impact negatively on the species.
Future recording: systematic checking, especially inland, is needed to obtain a more accurate picture of the true distribution of the Small Copper in Donegal.

Small Tortoiseshell (*Aglais urticae* (L.))

National and regional distribution in 10km squares: Republic of Ireland (DNFC survey) 457; Northern Ireland 157 10km squares; Donegal 70 10km squares, one new square in 2002.
Distribution and habitat: the Small Tortoiseshell is currently the fifth most recorded butterfly in Donegal. It is present in most habitats and absent only in the most exposed localities. It is resident on Aranmore and Tory islands and has been recorded on all the 10km squares in Inishowen. 2002 was a poor year for the Small Tortoiseshell in parts of Donegal. Larvae were recorded at Rossnowlagh in early October, reflecting the poor breeding conditions in mid-summer and the exceptionally fine weather in September, which resulted in this late breeding. It was recorded in 2002 on new 10km square C20.
Status: although very widely distributed, one seldom sees more than half a dozen adults at any one time at most sites and it thus appears less numerous than the Peacock. Like the Peacock, this species also took a nosedive in the 1980s (R. Sheppard, *pers. comm.*) but through the 1990s it seemed to recover most of its former losses in Donegal. Areas where it is abundant include Aranmore, Murvagh and along the coast of Donegal Bay, where twenty were recorded in one hour in Salthill Gardens on 20 September 2002.
Potential threats: destruction of nettle clumps.
Future recording: the Small Tortoiseshell has still to be recorded on 10km squares B94, C14, G47, and the Donegal part of trans-border squares H06, H16, H17, and H28.

Small White (*Pieris rapae* (L.))

National and regional distribution in 10km squares: Republic of Ireland (DNFC survey) 413; Northern Ireland 108 10km squares; Donegal 42 10km squares, 5 new 10km squares in 2002.
Distribution and habitat: the present recorded distribution of the Small White shows it to be abundant on the south side of Donegal Bay and with a significant presence in the north of the county in coastal areas of the Fanad, Inishowen and Rosguil peninsulas. It has not been lately

recorded on the off shore islands and many inland areas. New 2002 10km square records were B82, C02, G76, G95 and H09.

Status: probably is still under-recorded due to confusion with Green-veined White.

Potential threats: as for Large White but probably less reliant on cultivated plants.

Future recording: much checking needed inland, in west Donegal and off shore islands.

Speckled Wood (*Pararge aegeria* (L.))

National and regional distribution in 10km squares: Republic of Ireland (DNFC survey) 625; Northern Ireland 144 10km squares; Donegal 63 10km squares, 1 new 10km square in 2002.

Distribution and habitat: the Speckled Wood occurs in most of Donegal, except in the more exposed locations. It is at present shown to be the sixth most commonly recorded resident species in the county, as compared with the second most recorded species in the Republic of Ireland, as a whole. It has been recorded in all of Inishowen save for 10km square C35 and in nearly all of the remaining 10km squares in north Donegal except for exposed headlands and Tory Island. It is found on the sheltered side of Aranmore Island. The new 2002 10km square record was C00.

Status: the Speckled Wood is plentiful in Donegal in most areas with woods or sufficient shelter provided by hedges. It is maintaining its position and is under- recorded inland.

Potential threats: felling of trees and recurring severe hedge trimming locally pose some negative impact on the Speckled Wood. It benefits from the planting of new woodlands.

Future recording: 10km squares needing to be checked: B90, C04, C14, C35, G76, G99, H08, H09 and the Donegal portions of trans-border 10km square H28.

Conclusions

These eleven species may be found in most parts of Donegal, except for very exposed areas. The Large White and to a lesser degree the Small White are showing a fall in numbers in recent decades due to changes in horticulture and gardening practices. The main future work on the widespread resident species in Donegal, will be on the Small Copper, Large and Small White, and to establish the Common Blue's inland distribution.

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I thank those who contributed records during the survey. These are: Craig Ayres, Anne Barton, Don Cotton, Pol Cormacain, John Cromie, Nick Duff, Emer Magee, Eamonn McGlinchey, David McNamara, Philip Moss, Pat Murphy, Sean OGaoithin, Robert Pocock, Liz and Ralph Sheppard, Sue Shiels, Alison and Maurice Simms, Frank Smyth and Elizabeth Temple. In particular I thank Ralph Sheppard for his information on long-term butterfly distributions in Donegal and Deirdre Hardiman for the base map.

FIGURE 1. Donegal butterflies: Small White (SW) 1995-2002.

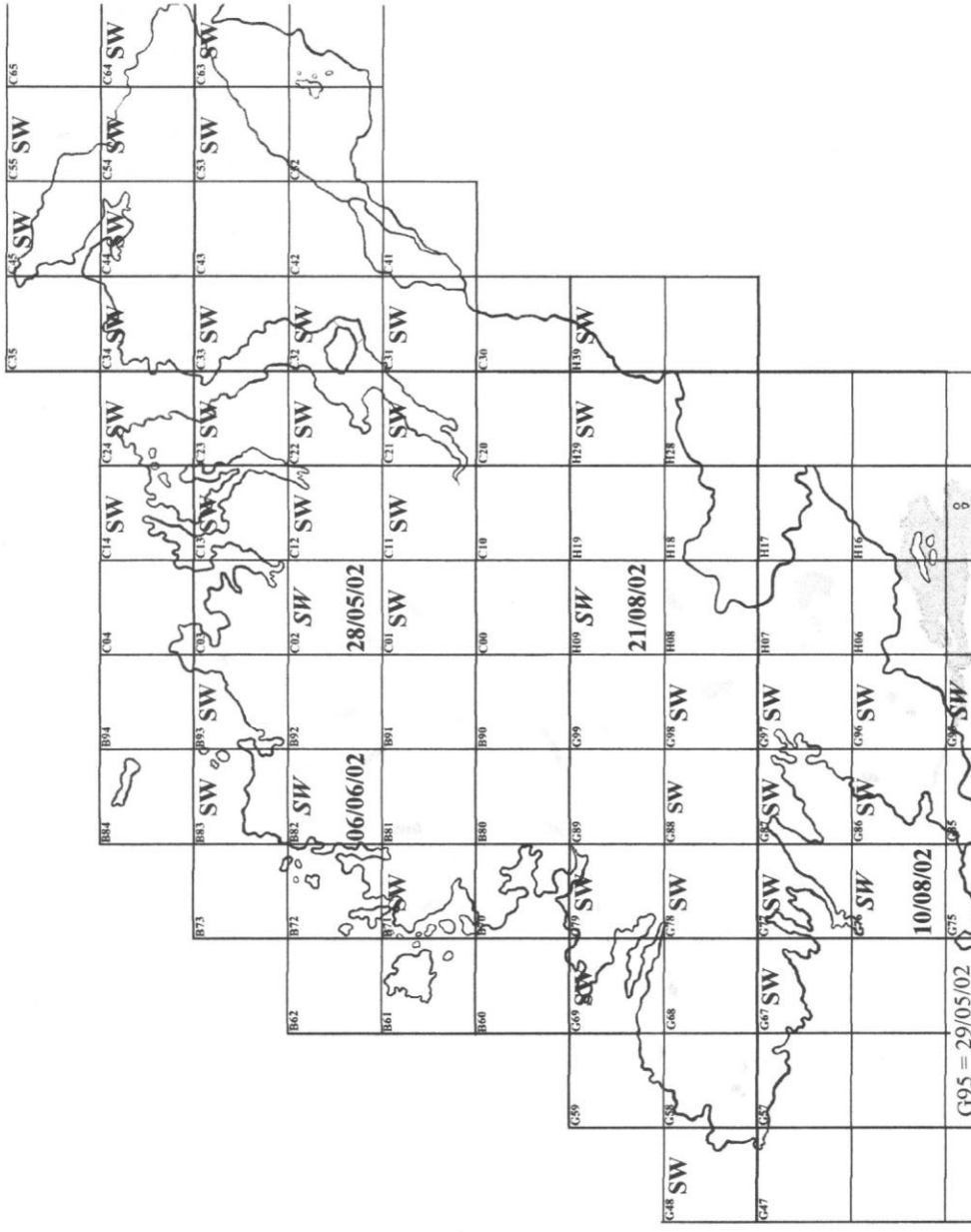


FIGURE 2. Donegal butterflies: Large White (LW) 1995-2002.

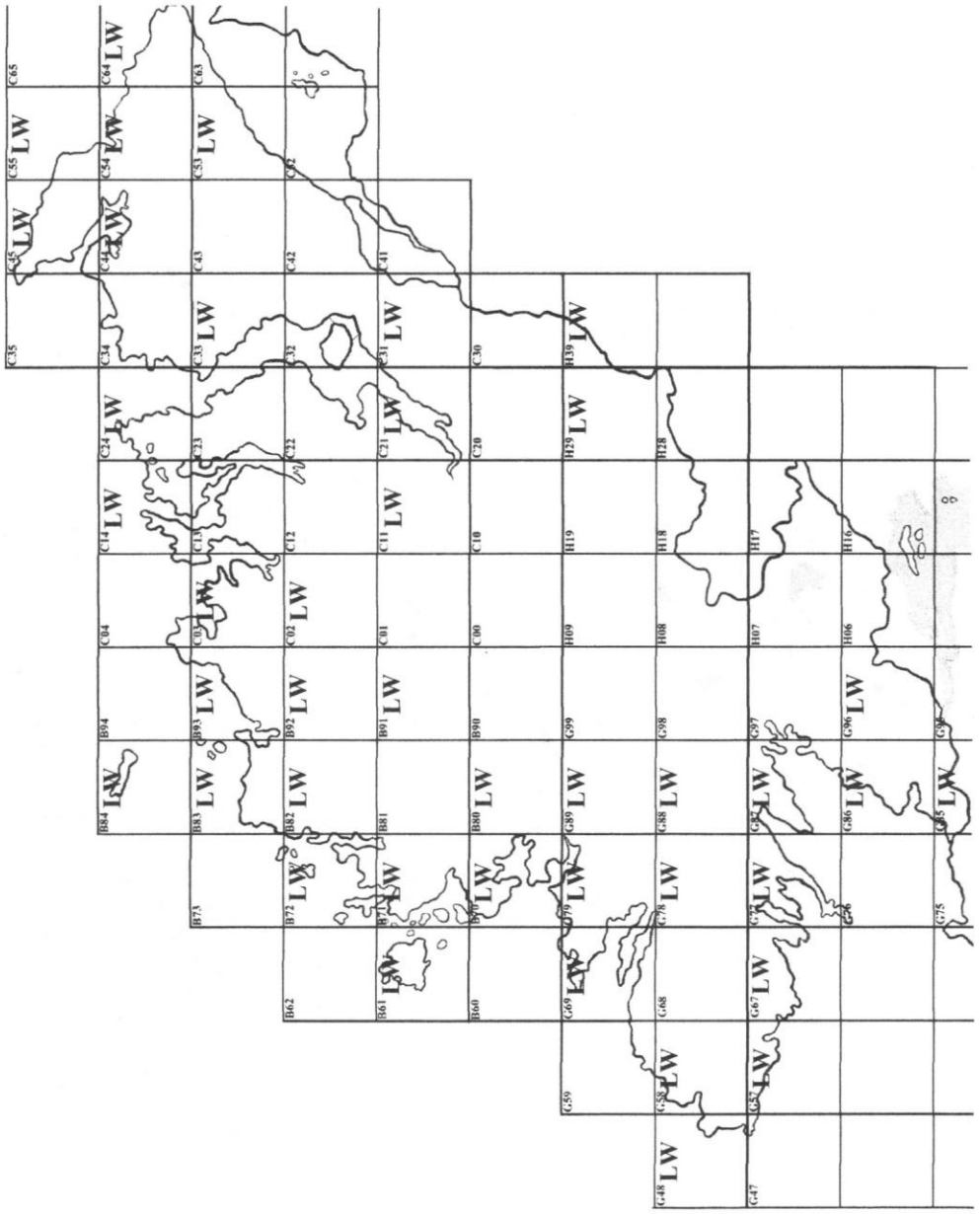


FIGURE 3. Donegal butterflies: Common Blue (CB) 1995-2002.

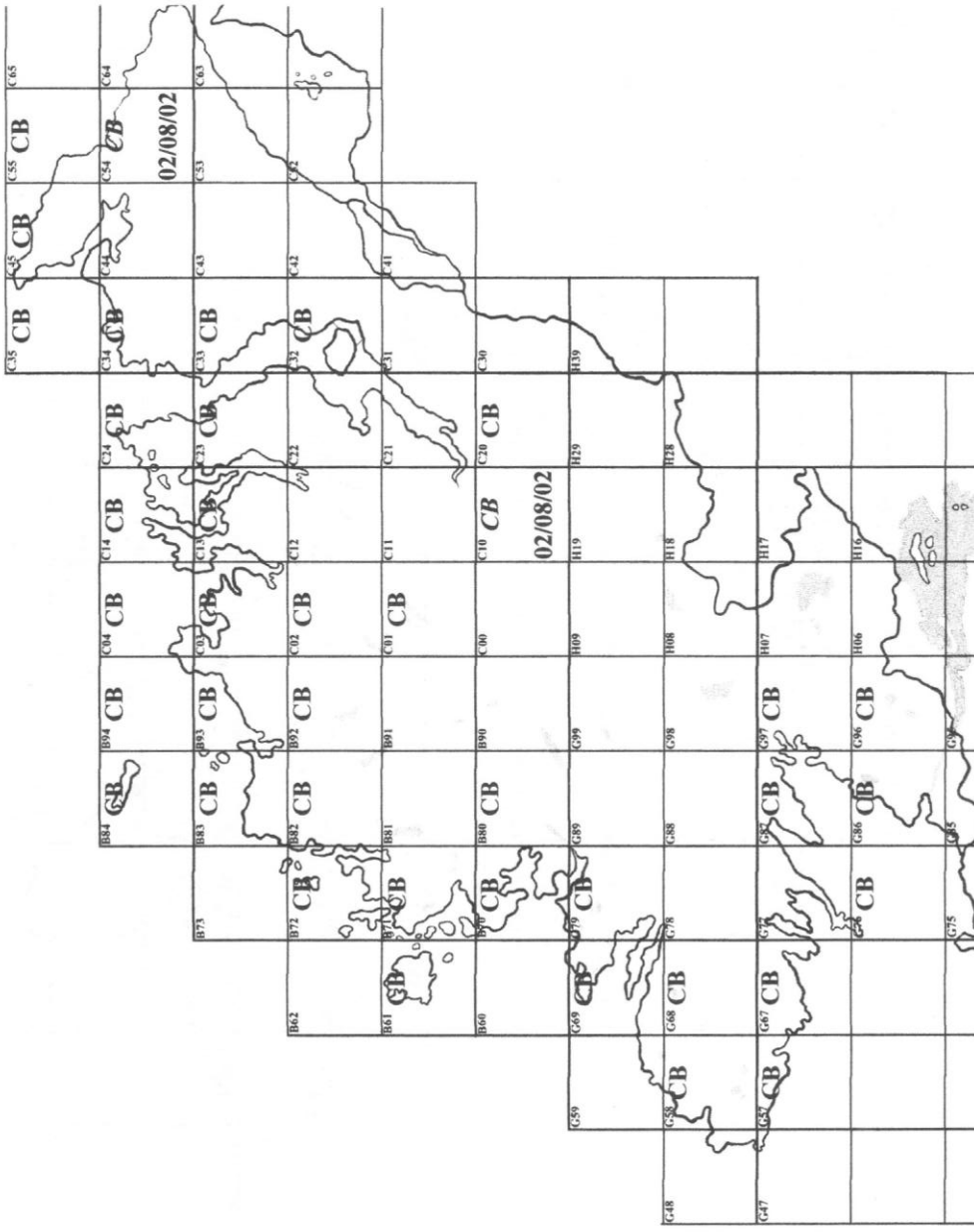
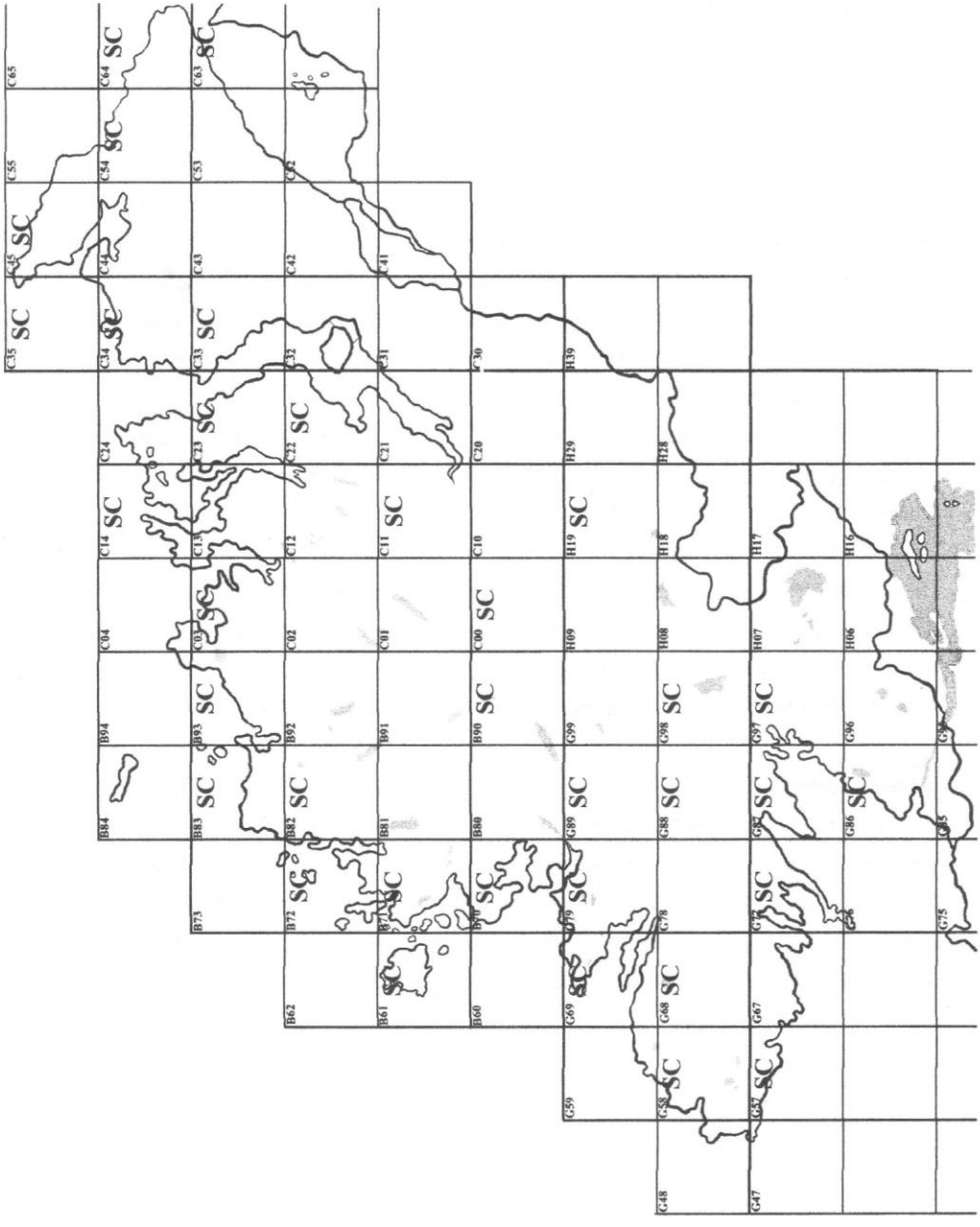


FIGURE 4. Donegal butterflies: Small Copper (SC) 1995-2002.



Bull. Ir. biogeog. Soc. No. 27 (2003)

NEW RECORD OF *BOTHRIONEURUM VEJDOVSKYANUM* ŠTOLC, 1888 (ANNELIDA: OLIGOCHAETA) IN IRELAND

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A survey of the free-living freshwater Oligochaeta of Ireland, funded by the Heritage Council, commenced in March 2002. Oligochaete specimens were examined from 331 sites, including a shallow littoral area of Poulaphouca Reservoir, Co. Wicklow (vice-county 20; grid reference N96908 12686). Here, one individual of *Bothrioneurum vejdovskyanum* Štolc was collected (WRT) on 22 August 2002 and identified using the taxonomic characters outlined in Brinkhurst (1971) and Timm (1999).

A pronounced prostomial pit and modified penial chaetae identified the specimen as a mature *B. vejdovskyanum*. Stalked spermatophores, attached to the genital segments after copulation (Timm, 1999), were visible.

B. vejdovskyanum is a cosmopolitan freshwater species (Brinkhurst and Jamieson, 1971; Timm, 1980) often found in thermally polluted waters (Timm, 1999). Reproduction is mainly asexual (Ohtaka, 2000), occurring by fragmentation (Brinkhurst and Jamieson, 1971). Sexually mature individuals are rare (Timm, 1999).

The specimen has been deposited in the Natural History Museum, Dublin.

Acknowledgements

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A SURVEY OF LOCAL RESIDENT BUTTERFLIES IN COUNTY DONEGAL, IRELAND

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Introduction

During the Butterfly Conservation (UK) Butterflies for the New Millennium project (BNM) of Britain and Ireland, the Dublin Naturalists' Field Club (DNFC) coordinated the project for the Republic of Ireland. A total of 614 10km square records were obtained for Donegal. Most of these records were made in 1998 and 1999, with a few backdated to as far as 1995.

The DNFC survey significantly increased the previous coverage for most species but because of the small number of recorders in relation to the size and topography of Donegal together with the short period of the survey, there clearly remained many large data gaps still to be filled. Of particular importance were the twelve known resident species with a local distribution. These twelve species are: Dark Green Fritillary, Dingy Skipper, Grayling, Green Hairstreak, Holly Blue, Large Heath, Silver-washed Fritillary, Marsh Fritillary, Small Blue, Small Heath, Wall Brown and Wood White.

In 2000, the Praeger Committee for Field Natural History of the Royal Irish Academy provided support for a targeted survey in Donegal of these twelve local resident species. In 2001, surveying was continued and special emphasis was given to Holly Blue and Large Heath. In 2002, the Heritage Council provided support for a survey in Donegal aimed at the Dingy Skipper, Holly Blue, Large Heath, Marsh Fritillary, Small Blue and Wood White.

Strategy and format of the 2002 survey

The 2002 survey comprised two components. Firstly, I spent seven periods, totaling twenty-nine days from May to September, in the field during the main flight or larval periods of the six targeted species. Secondly, I visited the small number of butterfly recorders resident in Donegal, who had contributed to the previous surveys, spending time in the field with four of them. I also attempted to increase the number of contributors. In May, in company with David

Nash, I presented a talk on butterflies in Donegal and on the progress of the Donegal survey to Dúchas Conservation Rangers and Gardening Staff in Glenveagh. Subsequently I spent time in the field with two of the Rangers and also visited the Glenveagh Gardens with Sean OGaoithin and discussed with him possible ways of increasing the butterfly numbers in the gardens. I prepared lists of prospective sites for the six species and prepared and distributed checklists for all the different butterfly species. My own records and those of some of the other recorders were entered on the standard record sheets of Butterfly Conservation which include six figure Irish grid references for each record. The records were also added to the database of the DNFC and to the master 10km square grid maps of Donegal based on a figure provided by Deirdre Hardiman.

Summary of the field work in 2002

The seven times that I spent in the field, as well as coinciding with the local resident species' flight and larval periods, were chosen as far as possible when the weather forecasts indicated reasonable weather conditions. This was difficult in 2002, as the weather from mid-May to early August was exceptionally cool and cloudy in Donegal.

TABLE 1. Summary of results for local resident species in Donegal.

Species	1995-2001 10km square records	New 10km square records in 2002	Total of Donegal 10km square records
Dark Green Fritillary	26	0	26
Dingy Skipper	2	2	4
Grayling	22	1	23
Green Hairstreak	29	6	35
Holly Blue	7	4	11
Large Heath	21	3	24
Marsh Fritillary	4	0	4
Silver-Washed Fritillary	10	4	14
Small Blue	11	0	11
Small Heath	34	4	38
Wall Brown	19	1	20
Wood White	9	6	15

Overview of the individual species

Dark Green Fritillary (*Argynnis aglaja* (L.))

National and regional distribution: Republic of Ireland (DNFC survey) 71 10km squares; Northern Ireland 23 10km squares; Donegal 26 10km squares, no new squares in 2002.

Distribution and habitat: in Donegal, the Dark Green Fritillary occurs most often in dune areas and also on exposed hillsides, in flowery semi-natural meadows and in areas with scrub. So far the records are strongly coastal and the species occurs on Aranmore Island. Records on inland

10km squares B92 and G88 however show it is also sometimes present away from the coast. In 2002, the species did well in some of its dune sites and dozens were seen at Sheskinmore and Glencolumbkille. Three possible new 10km squares (G95, G96 and H06) in the far south of the county are subject to confirmation, as the insects were only seen in flight.

Status: the Dark Green Fritillary is widespread in Donegal and it is certainly present on more 10km squares than has been recorded up to now. Its absence from Donegal Bay, north of Murvagh and including St John's Point, seems particularly surprising.

Potential threats: intensive grazing of dunes, especially by sheep, seems to be the greatest threat to the species in Donegal. Golf links and caravan parks also impact negatively in some areas.

Future recording: further checking is needed of the three squares awaiting confirmation, as well as of additional coastal 10km squares including those in south Donegal (G57, G67, G76, G77); in north Donegal (B83, C33, C13); together with suitable inland locations such as in C02.

Dingy Skipper (*Erynnis tages* (L.))

National and regional distribution: Republic of Ireland (DNFC survey) 47 10km squares; Northern Ireland 6 10km squares (Fermanagh); Donegal 4 10km squares, 2 new squares in 2002.

Distribution and habitat: in Donegal, the Dingy Skipper has been recorded in recent times at Murvagh (G87), in sheltered hollows in the dunes. In the period 1950-1980 it was present also at Portnoo (G79) on hillsides in semi-natural meadows but much of this area has since been affected by building. In 1990 it was also recorded by Boyd and Rippey on squares G67 and G96. In August 2002, a larva was found on a sunny bank at Clooney (G79). In 2001 it was recorded again on square G69 at Rosbeg along a bank adjoining a minor road and in 2002 on the same 10km square in dunes at Sheskinmore. A further interesting new site was located in 2002 at Kilbeg (G57), in a sheltered partly re-vegetated artificial rock cutting for a driveway to a house.

Status: the Dingy Skipper is present in the neighbouring counties of Fermanagh and Sligo and, in view of its occurrence in northern lands such as Scotland and Sweden, and the former records, there are are good reasons to expect it to occur more widely than is presently recorded in Donegal.

Potential threats: the apparently very local distribution of this species and the usually small

colony size make it very vulnerable to site disturbance. Among threats are intensive grazing, especially by sheep and severe trimming of sunny roadside verges containing Bird's-foot-trefoil (*Lotus* spp).

Future recording: this is a small, drab and inconspicuous butterfly and easily missed by those unfamiliar with it. Its moth-like appearance and close similarity to two day flying moths also add to the difficulty in identification. Moreover, its flight period (late May/early June) does not coincide with the main opportunity for many recorders to look for it. At the same time, its larval food plant (Bird's-foot-trefoil) is plentiful in many districts in Donegal and with sufficient time and practice the larvae are quite easy to locate in mid-summer. Systematic surveying is needed in warm sheltered areas with plentiful Bird's-foot-trefoil. This should be especially concentrated in south Donegal, extending from known areas of occurrence in Fermanagh such as 10km squares G96 and G97, 10km squares close to Portnoo such as G89, southern coastal squares such as G67, G76 and G85 and northwards along the coast in 10km squares B70, B71 and B72.

Grayling (*Hipparchia semele* (L.))

National and regional distribution: Republic of Ireland (DNFC survey) 112 10km squares; Northern Ireland 22 10km squares; Donegal 23 10km squares, 1 new square in 2002.

Distribution and habitat: in Donegal, the Grayling is found in dry locations such as dunes, cliffs and hillsides with bare patches of rock and scree. So far, all records are close to the coast. It has been recorded from six 10km squares in Inishowen as well as on Aranmore and Tory islands. It was recorded in new 10km square C23 during 2002.

Status: the Grayling is widespread and locally common on most coastal 10km squares in Donegal. Its absence so far at Glencolumbkille, Slieve League and Murvagh is surprising. The position inland remains unclear but, if present there, it is likely to be very local.

Potential threats: the species appears to be maintaining its position along most of the coastline. Locally intensive grazing and increased fertilizer use as well as loss of dune habitat to golf links and caravan parks are impacting negatively on the species.

Future recording: checking is required of those coastal 10km squares, where it remains unrecorded, especially B83, B94, C13, C14, C33, C62, C64, G47, G48, G58 and G87. Systematic surveying of suitable inland dry rocky habitats also needs to be done.

Green Hairstreak (*Callophrys rubi* (L.))

National and regional distribution: Republic of Ireland (DNFC survey) 81 10km squares; Northern Ireland 32 10km squares; Donegal 35 10km squares, 6 new squares in 2002.

Distribution and habitat: the present records of the Green Hairstreak in Donegal show it to be widespread but very local. Some of the best sites are sheltered areas such as bog roads or areas adjoining bogs, where gorse (*Ulex europaeus*) and bilberry (*Vaccinium myrtillus*) are plentiful and willow (*Salix*) and other low green shrubs are present for perching in the sun. 2002 was a good year in Donegal for this species with large numbers reported early in the season and it was recorded on six new widely spaced 10km squares (C32, C43, G77, G95, G97 and H09).

Status: it is found on coastal 10km squares, although seldom right on the shore (too windy?) and widely and more commonly inland. It has yet to be recorded in most of east Donegal or on the offshore islands. Locally, it can be present in large numbers but appears to be absent in many areas with plentiful gorse, where the habitat seems to be suitable.

Potential threats: the essential requirements and the primary larval food plant of this species in Donegal remain uncertain. For these reasons it is difficult to list the most serious threats. There does not appear to be a significant change in its abundance over the past fifty years.

Future recording: although unmistakable when seen settled, it seems likely that this small butterfly still remains under-recorded in Donegal. Continued systematic surveying of suitable sites in those 10km squares where it is at present missing, especially in the north and east of the county, is necessary to get a true picture of the distribution of the Green Hairstreak in Donegal.

Holly Blue (*Celastrina argiolus* (L.))

National and regional distribution: Republic of Ireland (DNFC survey) 88 10km squares; Northern Ireland 16 10km squares; Donegal 11 10km squares, 4 new squares in 2002.

Distribution and habitat: the Holly Blue is confined in Donegal to districts with remnants of native woodlands. Such habitat is mostly in east and north Donegal. In the recent surveys, it has been recorded in eleven 10km squares including Glenveagh (C02) and Ards Forest (CO3). In 2002, the Holly Blue was recorded on four additional 10km squares (C00, C13, C21 and C22), all in the northern half of the county. In Donegal, it has only so far been recorded in the first spring brood but based on recent experience further south in Ireland, in hot summers, it

should be checked for in Donegal in warm areas during August.

Status: the Holly Blue is known to vary dramatically in numbers, even in places where it is well established (Thomas, 1986). During 2001 and 2002 the species was recorded in many of its former Donegal localities on 10km squares C00, C11 (including south of Letterkenny) C12, C13, C21, C22 C23 and on G98. It was also found at Knader Wood, near Ballyshannon (G96), which is a completely new location for the species.

Potential threats: shading over time due to changes in some woods and holly (*Ilex aquifolium*) cutting for Christmas may be among the negative impacts on this species in Donegal.

Future recording: intensive systematic surveying is required of suitable areas, especially sites where the species used to occur. Such areas are wooded, as at Lough Gartan and Lough Veagh (C01), Carndonagh Wood (C44), near Gweebarra Bridge (G79/G89) and at sites with holly in south Donegal on 10km squares such as G86, G87, G95, G97, H08 and H16. The Holly Blue can also occur in towns and should be looked for in April and May in town gardens, with tall holly bushes. Towns worth checking include Ballybofey, Ballyshannon, Buncrana, Donegal, Lifford and Stranorlar.

Large Heath (*Coenonympha tullia* (Müller))

National and regional distribution: Republic of Ireland (DNFC survey) 28 10km squares, of which 11 were in Donegal; Northern Ireland 25 10km squares; Donegal 24 10km squares, 3 new squares in 2002. The species is probably still under-recorded in much of western Ireland.

Distribution and habitat: the Large Heath so far has been recorded widely but locally in many areas of wet bog in west and central Donegal.

Status: since it is a "northern" species it seems most likely also to be present in many other boggy areas, including on Inishowen. In 2002, three new 10km square records (G95, H06 and H17) were added in south Donegal, close to the border with Northern Ireland. Efforts in early July to add new 10km squares in north Donegal proved unsuccessful and may have been due to the cool weather during the Large Heath's flying period in late June and early July.

Potential threats: large-scale drainage of bogs is the main threat to the Large Heath. The extensive nature of blanket bog in Donegal, coupled with so far only a limited number of large, mechanical turf cutting schemes, provides a more secure future for the Large Heath in this part of Ireland than in the Midlands.

Future recording: the Large Heath requires systematic surveying during its main flight period in Donegal from about 20 June to 10 July. Recorders need to be aware of the risk of confusion with the Small Heath and be prepared to search for it in areas of wet bog, often some distance from roads. However, the two Heaths seldom occur together at the one site in Donegal. The areas for particular attention are extensive wet bog, including southern facing hills covered by blanket bog. Areas for further investigation are especially in north Donegal but also in central upland areas such as C00, C01, G99 and H09 and a few sites north of Donegal Bay as on G57.

Marsh Fritillary (*Eurodryas aurinia* (Rottemburg))

National and regional distribution: Republic of Ireland (DNFC survey) 66 10km squares; Northern Ireland 20 10km squares; Donegal 4 10km squares.

Distribution and habitat: the three areas in which the Marsh Fritillary has been recorded in recent surveys of Donegal, are all isolated and near the coast. Mainly dunes in the case of Cruit Island (B71, B72); fen habitat at Sheskinmore (G69), and fen and limestone pavement at St John's Point (G76). Devil's bit Scabious (*Succisa pratensis*), the larval food plant, is widespread and often plentiful in wet and dry habitats in many parts of the county. Attempts to locate the larvae as well as the adults so far have proved surprisingly unsuccessful. Indeed, no new sites were recorded in the last three years and no stages of the species were recorded in Donegal in 2002. Over the past century, the Marsh Fritillary has seldom been plentiful in most of Donegal, odd specimens being recorded here and there over a wide area, especially in the west of the county. Can it now be absent from so many apparently suitable localities?

Status: uncertain, but it is the species in Donegal about which there must be most concern.

Potential threats: intensive grazing, afforestation and habitat disturbance of machairs, resulting in fragmentation of habitat are particular threats for the Marsh Fritillary.

Future recording: there is an urgent need for continued systematic and thorough surveying of the current position of the Marsh Fritillary in Donegal. Priority areas for investigation include: former sites such as B61, B70, B91 and G89; the Pettigoe Plateau (G96, H06, H07); machair localities such as at Bunbeg (B82), Glencolumbkille (G58) and Murvagh (G87), areas close to presently known colonies such as G77 and G79 as well as sheltered inland areas such as 10km squares C02 and G88.

Silver-Washed Fritillary (*Argynnis paphia* (L.))

National and regional distribution: Republic of Ireland (DNFC survey) 125 10km squares; Northern Ireland 32 10km squares; Donegal 14 10km squares, 4 new squares in 2002.

Distribution and habitat: the Silver-washed Fritillary occurs in and near woodland, including some coniferous plantations, as well as in sheltered areas with tall hedges and scrubby trees.

Status: the species was plentiful in some of its Donegal sites in 2000, including Ards Forest (C03), Gweebarra Bridge (G79/G89) and Lettermore (G88) and in 2001 in the gardens at Glenveagh National Park. It was found on four more 10km squares (C12, C22, G77 and G97) in 2002, when the species appeared to do quite well in Donegal. There can be little doubt that it is present in many other sheltered localities and is under-recorded because of its similarity with the Dark Green Fritillary. It also may be seen on bramble (*Rubus*) blossoms and knapweed (*Centaurea*) and in gardens and on hedges on nectar sources such as *Buddleia* and privet (*Ligustrum*).

Potential threats: increased shading in plantations may pose a threat to some colonies.

Future recording: checking of unconfirmed sightings on 10km squares B70 and G57; former sites such as on square G69, remaining wooded areas in north Donegal, especially on squares C21, C23 as well as sheltered wooded sites elsewhere are the places with the best potential for locating this magnificent species.

Small Blue (*Cupido minimus* (Fuessly))

National and regional distribution: Republic of Ireland (DNFC survey) 54 10km squares; Northern Ireland 1 10km square; Donegal 11 10km squares.

Distribution and habitat: the Small Blue is primarily restricted in its range by the availability of Kidney Vetch (*Anthyllis vulneraria*), its larval food plant. In Donegal, this plant occurs in limited areas where the soil is lime-rich and is not overgrown by taller vegetation. Of the eleven 10km squares where the Small Blue has been recorded in Donegal in the recent surveys, eight are predominantly dune habitat (B70, B71, B72, B82, G59, G69, G87); two are rocky/cliff habitat (G76, G77) and one is a re-vegetated road cutting in limestone (G86). In 2001 and again in 2002, it was recorded in the dunes at the back of Ards Forest (C03), which so far is its most northern sighting in the county in the recent period of survey. In 2002, it was seen at several new sites within 10km squares B71, B72 and G86, in which squares it already

had been previously recorded at other sites.

Status: the Small Blue is usually very local in its occurrence in Donegal. So far, only at Cruit Island and the adjoining mainland (B71, B72) and South Donegal Bay (G86, G87) has it been recorded at several sites on the same 10km square. It has yet to be confirmed at former sites on 10km squares G79 and G96. To date, its northernmost limit is at Ards (C03), despite repeated searches at other northern sites, including in areas of plentiful Kidney Vetch at Kinnegar (C22/C32), Lisfannan (C32) and Doagh Isle (C45). In Donegal, the Small Blue is sometimes present in quite exposed locations as well as warm sheltered sites.

Potential threats: shading by taller vegetation of the larval food plant and disturbance of habitat by intensive grazing, creation of caravan parks, holiday homes and golf links are the main threats.

In south Donegal, agricultural improvements and limestone quarrying may have been the cause for the loss of some former colonies, for example near Ballintra.

Future recording: careful checking is needed at suitable spots on 10km squares B61, B93, G79, G85, G96 and G97 as well as sheltered locations with plentiful Kidney Vetch in north Donegal.

Small Heath (*Coenonympha pamphilus* (L.))

National and regional distribution: Republic of Ireland (DNFC survey) 177 10km squares; Northern Ireland 91 10km squares; Donegal 38 10km squares, 4 new squares in 2002.

Distribution and habitat: the Small Heath is the most common and widespread of the twelve local species in Donegal. It occurs in dry and damp habitats from coastal dunes to mountain blanket bog. It has been recorded on Aranmore and Cruit islands, on eight 10km squares on Inishowen and in most of south and west Donegal. In 2002, it was located on four new 10km squares: C44, C45, C55, and H19.

Status: the Small Heath is found on most sites in small numbers but persists at low density over wide areas. The species seems to be single brooded in Donegal except on the south side of Donegal Bay where it occurs in small numbers in August and September at Murvagh (G87).

Potential threats: intensive sheep grazing and local loss of semi-natural grasslands are negative impacts on the species but it may be gaining from human activity in some areas where drainage of wet bogs can be beneficial to the Small Heath at the expense of the Large Heath.

Future recording: gaps remain in the records, especially in central, eastern and northern

Donegal. There seems to be good prospects of finding the Small Heath in many of the presently blank 10km squares.

Wall Brown (*Lasiommata megera* (L.))

National and regional distribution: Republic of Ireland (DNFC survey) 257 10km squares Northern Ireland 23 10km squares; Donegal 20 10km squares, one new square in 2002.

Distribution and habitat: the Wall Brown occurs in sheltered sunny well drained sites with ample areas of south and east facing rock outcrops and low cliffs. These most often are natural but the species also favours re-vegetated quarries and pits in some districts. The current distribution is concentrated strongly in west Donegal and extends as far north as the Fanad Peninsula (C14). Most of the 10km squares in which this butterfly so far has been found are coastal but two inland squares (B80 and C02) were recorded in the 2000 survey. It is present and quite common on Aranmore and Cruit islands. One new 10km square (B81) was added in 2002.

Status: the Wall Brown is abundant on several 10km squares in west Donegal, among which are B61, B70, B71, B72, G57, G67, G69 and G79. Elsewhere it appears much more local. It has still to be recorded on several coastal 10km squares in south Donegal and on Inishowen.

Potential threats: dumping of rubbish and the disturbance of the natural re-vegetation of old pits and quarries are negative factors in some areas.

Future recording: further checking is needed in south Donegal on coastal 10km squares, especially G48, G58, G87, G97, on C13 and C24 in Fanad and in dry sunny areas on Inishowen. The occurrence of the species inland also requires systematic surveying of suitable dry sites.

Wood White (*Leptidea reali* Reissinger)

National and regional distribution: Republic of Ireland (DNFC survey) 179 10km squares; Northern Ireland 44 10km squares; Donegal 15 10km squares, 6 new 10km squares in 2002.

In recent years, it has been established that the Wood White is represented in Ireland by two species, *Leptidea reali* and *L. sinapis* (L.). The two species can only be reliably separated by dissection and examination of the genitalia under a microscope. Initial investigations have shown that *L. reali* is much the more widespread of the two species in Ireland and so far appears to be the only Wood White species present in Donegal.

Distribution and habitat: the majority of the known Wood White sites in Donegal are shaded woodland edges or sheltered roadside verges. At most of its sites in Donegal, the Wood White appears to be very local in its occurrence. The current known distribution is substantially below what is to be expected considering its relative strength in Fermanagh and Sligo. Its still patchy distribution in south Donegal and the five isolated records in north Donegal strongly suggest that the Wood White remains substantially under-recorded in Donegal. The six new records in 2002 include a colony in west Donegal, extending on to 10km squares G79 and G89.
Status: the numbers so far recorded are small but it is likely that many have been mistaken for Green Veined Whites or female Orange Tips. In 2002, two specimens were examined by Ken Bond in UCC and identified as *L. reali*.
Potential threats: not enough is known of the distribution of the Wood White in Donegal at this stage to enable useful comment.
Future recording: a thorough and systematic survey of the Wood White in Donegal during its flight period in May and June is still needed. Efforts should initially be concentrated in sheltered well-vegetated areas with plentiful vetches (especially Meadow Vetchling (*Lathyrus pratensis*)) and 10km squares adjoining those squares where the species is known to occur in north and south Donegal.

Conclusions

The survey continues to build on the solid start made in Donegal by the Butterfly Conservation inspired Millennium Survey of Britain and Ireland. It needs to be stressed that, because of the local distribution of these species, the inconspicuous nature of several of them and the limited periods of sunshine in Donegal, the rate of surveying is relatively slow. For instance, in some of the successful sightings, up to half a dozen visits had to be made to a location before satisfactory weather conditions were obtained and the butterfly recorded. Considerable progress has been made in 2002 in the case of the Green Hairstreak, Holly Blue and Wood White. Sightings of the Dingy Skipper are also slowly beginning to increase in south Donegal. Nationally, the Donegal populations of the Large Heath and Small Blue are significant. At a provincial level, the numbers of the Dark Green Fritillary, Grayling and Wall Brown in Donegal are important. On the other hand, the recorded numbers in Donegal of the

Dingy Skipper, Marsh Fritillary and Wood White are still below what might be expected and these three species, together with the Large Heath, Holly Blue and Small Blue, continue to require intensive on-going checking. The Purple Hairstreak should also be sought in remnants of old oak woods from mid-July to mid-August.

Besides the new records obtained, many new prospective sites for future checking have been discovered. Equally importantly, the small team of butterfly recorders in Donegal continues to work and to grow in numbers. The momentum gained by the Butterfly Conservation survey in Donegal in the 1990s has been maintained and the numbers of records for most of the species have significantly increased during the past three years. Much work however still needs to be done and a sustained effort will be required over several more years in order to obtain a full picture of the true position of many of these butterflies. Donegal, because of its large size, wide range of habitats and many areas of semi-natural landscapes, is still relatively rich in many species of resident Irish butterflies. Nonetheless, many land-use changes are taking place in the county and it is important to compile an accurate baseline study of the more vulnerable butterfly species, if they are to stand a reasonable chance of having a sustainable future.

Acknowledgements

I acknowledge with grateful thanks the contribution of Craig Ayres, John Cromie, Eamonn McGlinchey, Ralph Sheppard, Sue Shiels, Maurice Simms and Frank Smyth for their ongoing help and advice during the year. I wish to thank the Donegal Staff of Dúchas for their encouragement and contribution of records. I thank Ken Bond for his examination of the Wood White specimens and Deirdre Hardiman for providing the base map template for the distribution maps. I am also very thankful to David Nash and the Dublin Naturalists' Field Club for their continued support and interest and to Paul Hillis for his suggestions in the field. Lastly, I thank the Heritage Council for their financial support in 2002, which allowed significant time to be given to six of the rarer species during the year.

Reference

Thomas, J. A. (1986) *RSNC guide to the butterflies of the British Isles*. Country Life Books, Hamlyn Publishing Group Ltd, Twickenham, England.

FIGURE 1. Donegal butterflies: Dark Green Fritillary (DGF) 1995-2002.

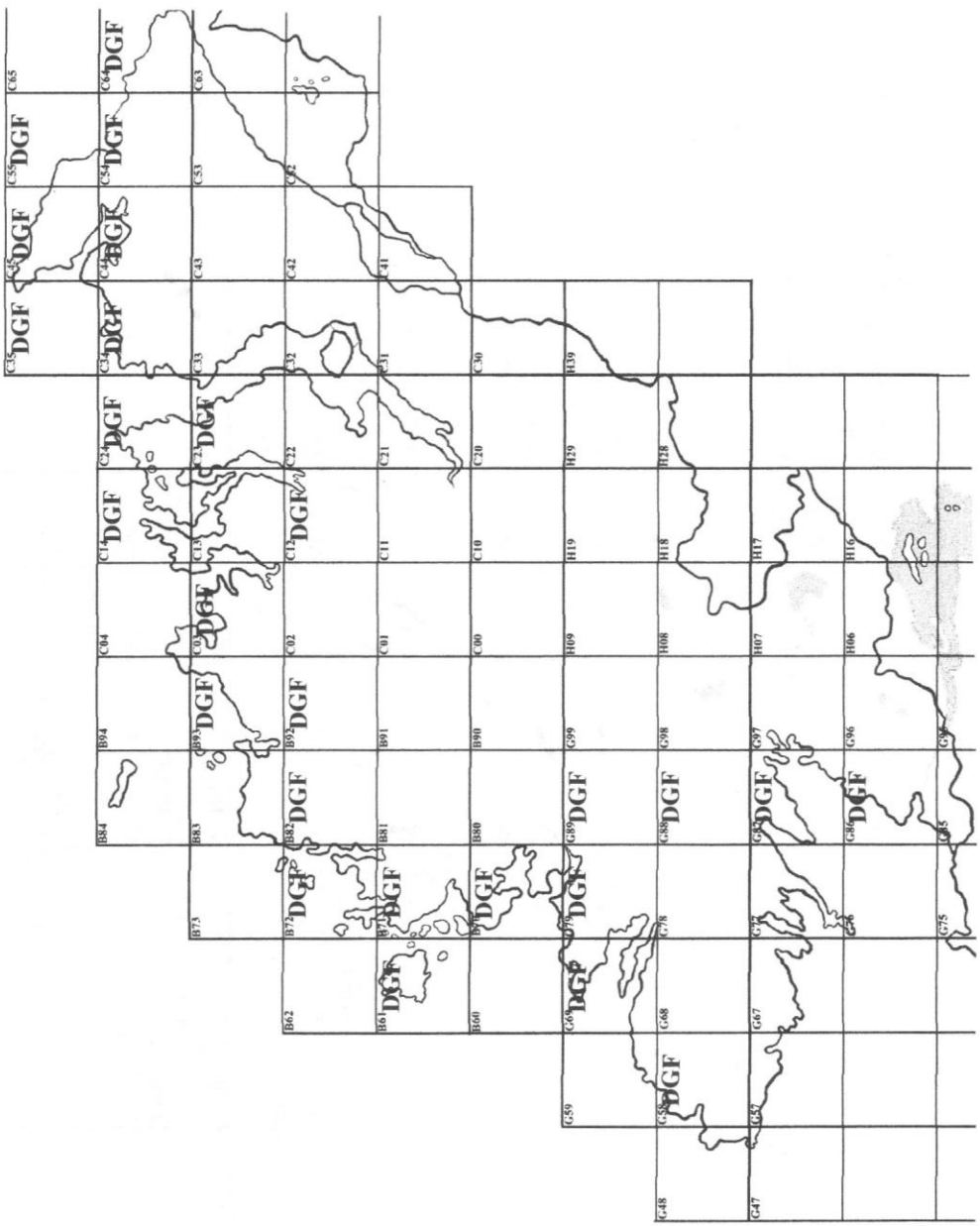


FIGURE 2. Donegal butterflies: Dingy Skipper (DS) 2001-2002.

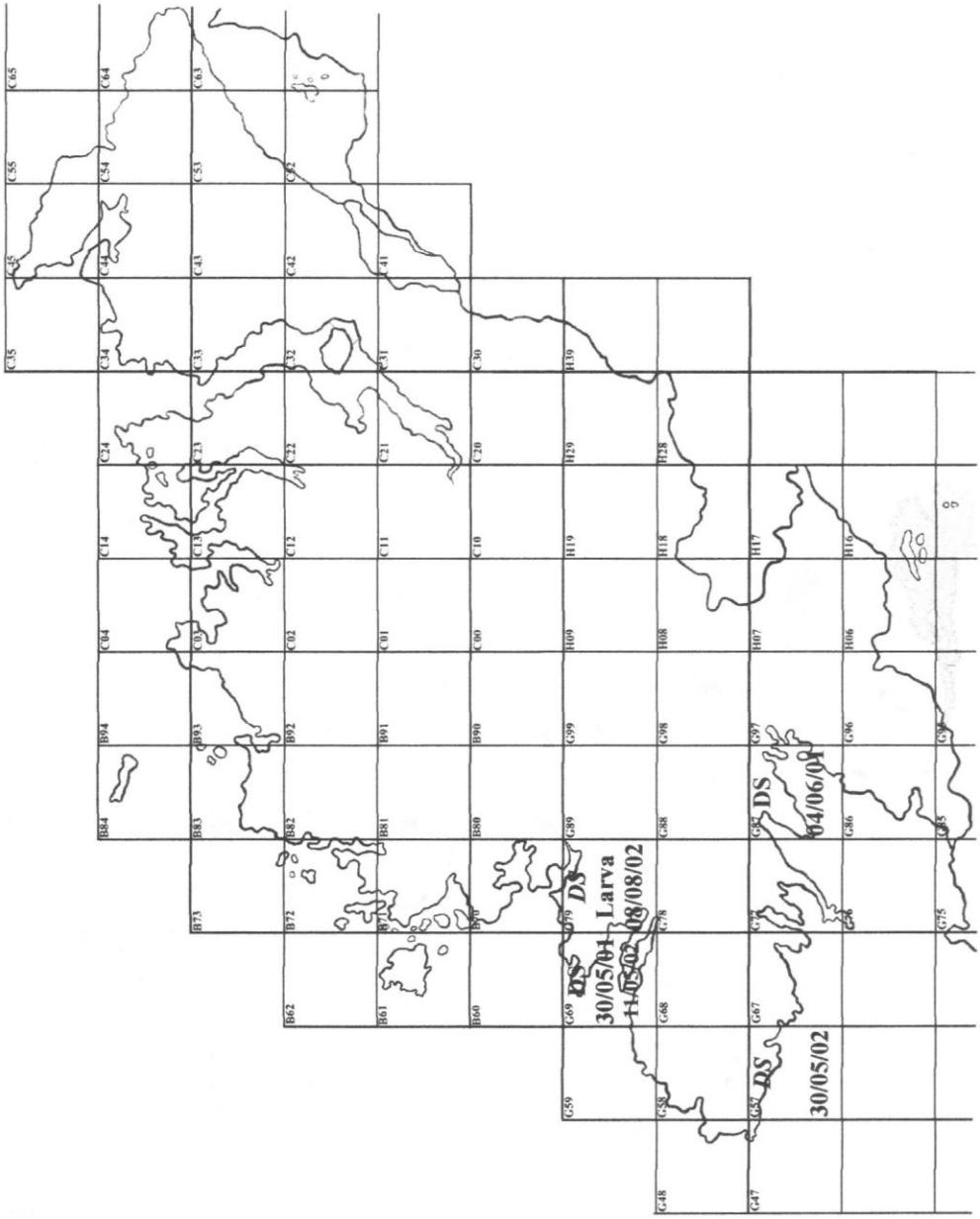


FIGURE 3. Donegal butterflies: Grayling (G) 1997-2002.

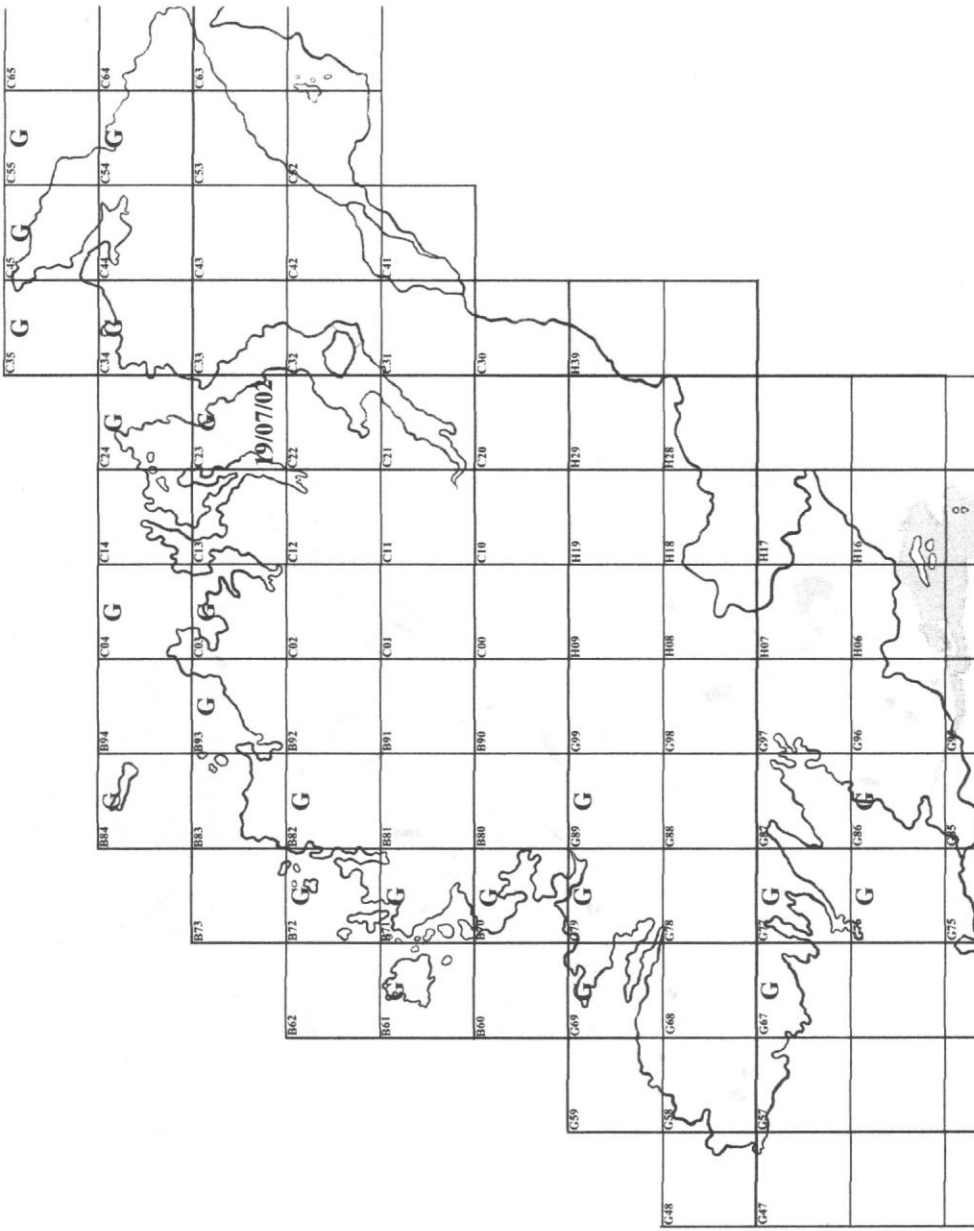


FIGURE 4. Donegal butterflies: Green Hairstreak (GH) 1995-2002.

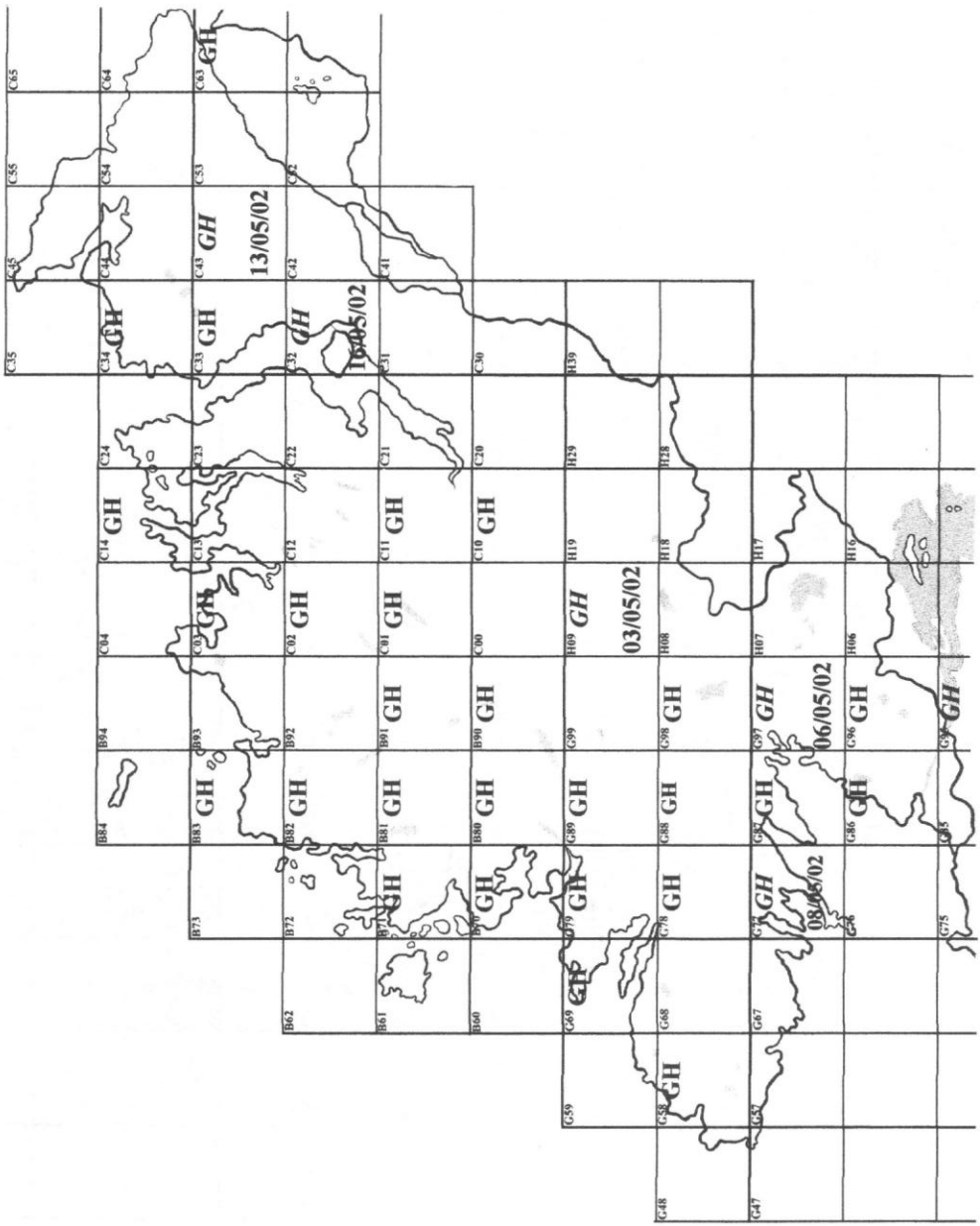


FIGURE 5. Donegal butterflies: Holly Blue (HB) 1999-2002.

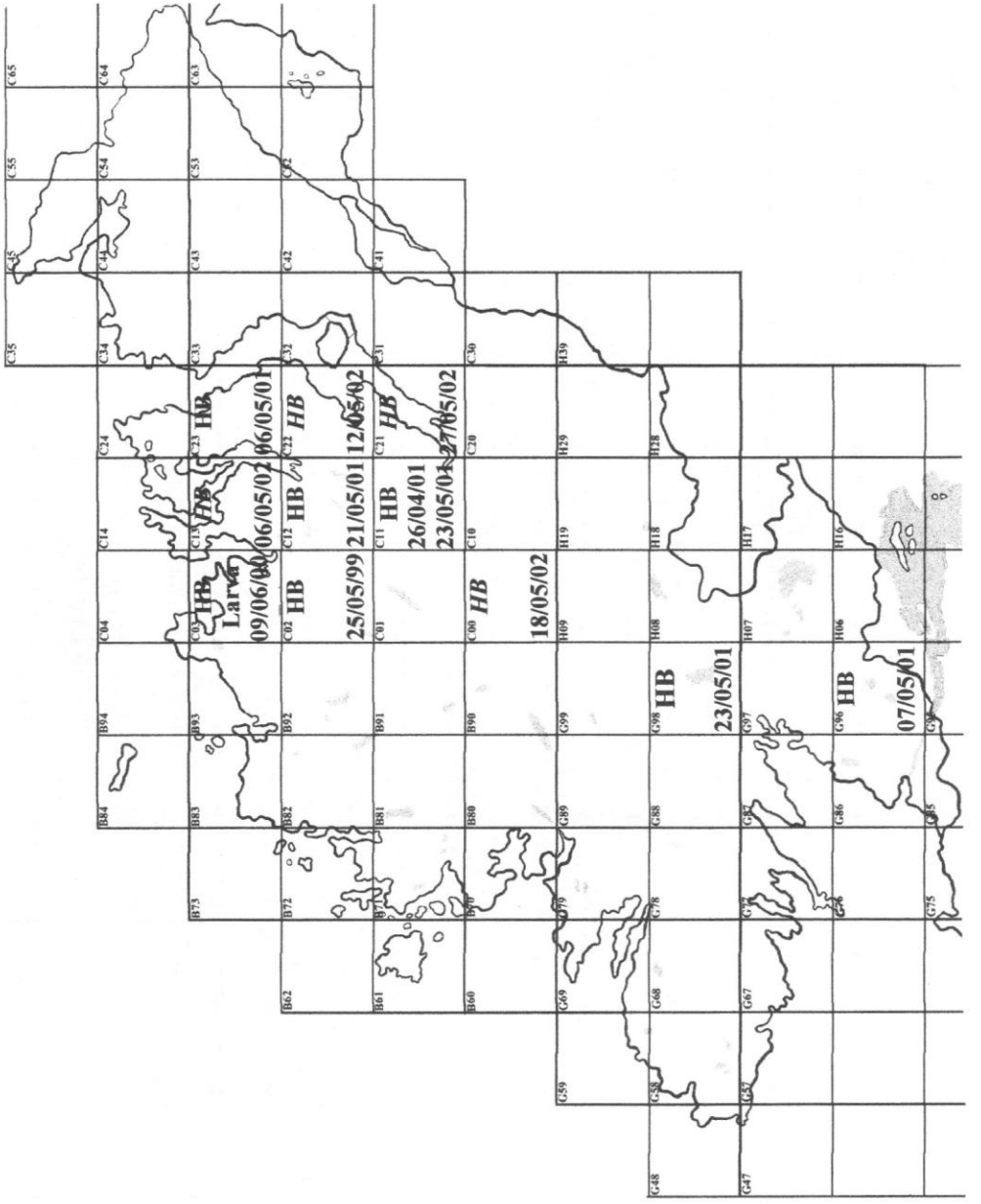


FIGURE 6. Donegal butterflies: Large Heath (LH) 1998-2002.

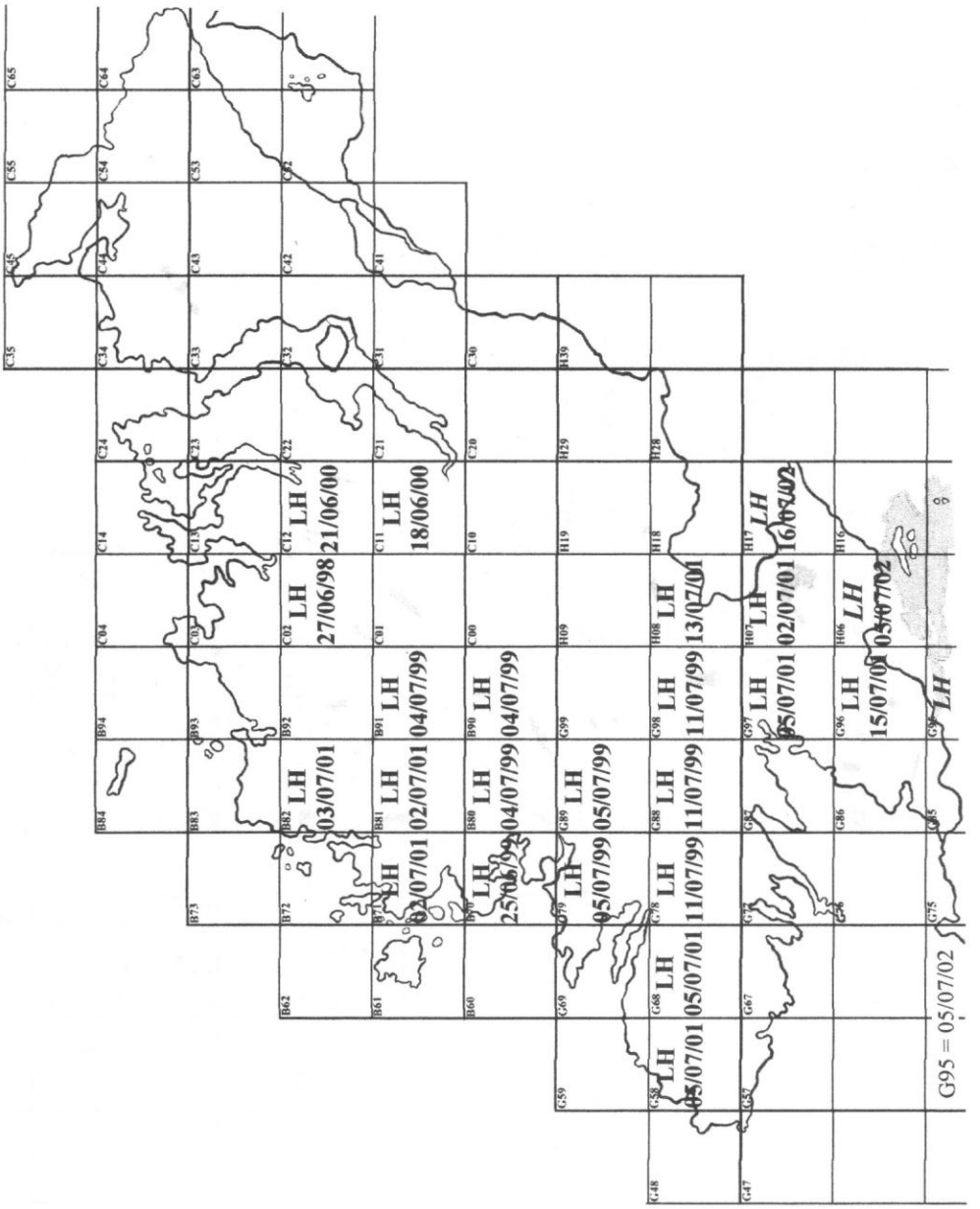


FIGURE 7. Donegal butterflies: Marsh Fritillary (MF) 1998-2002.

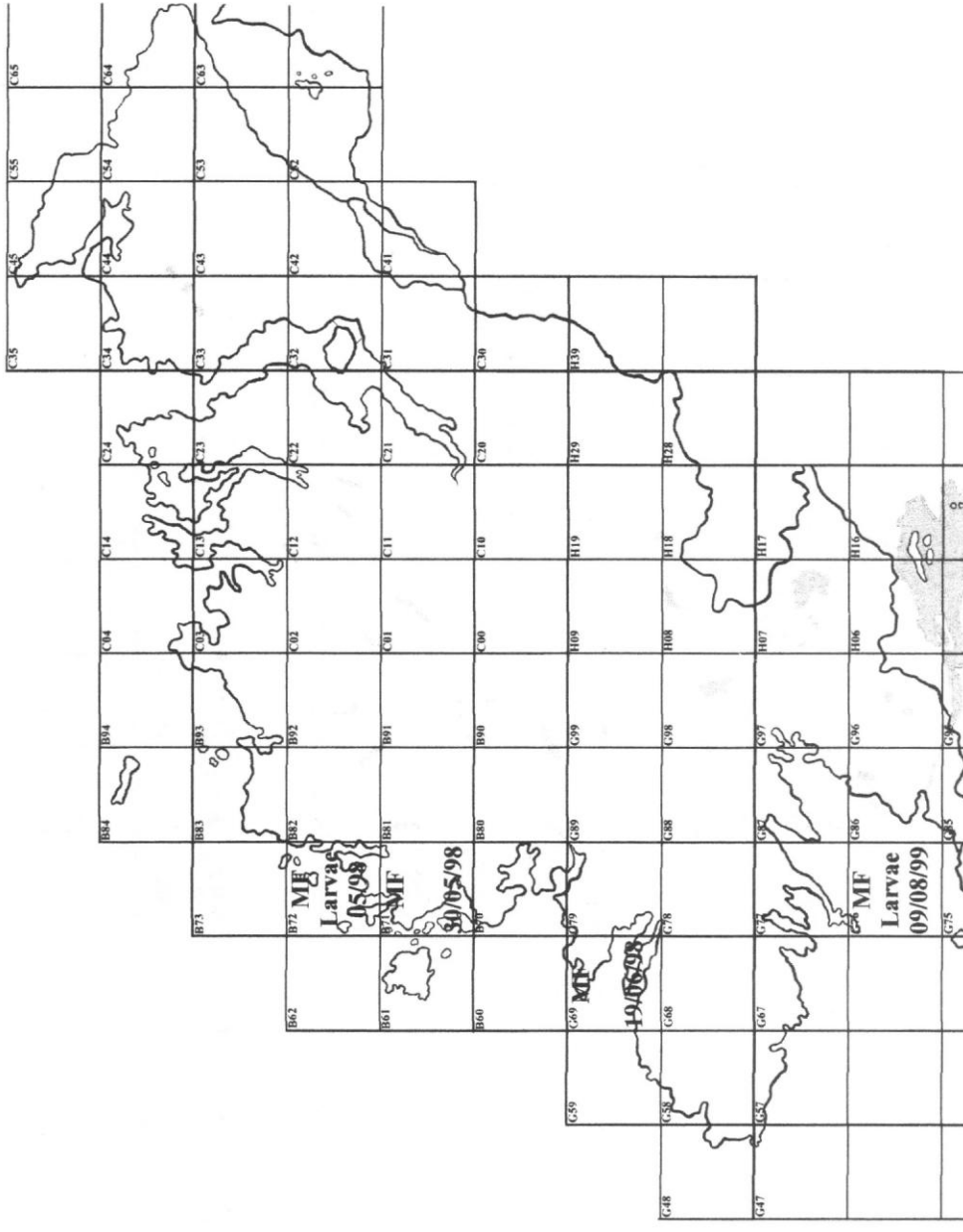


FIGURE 8. Donegal butterflies: Silver-Washed Fritillary (SWF) 1998-2002.

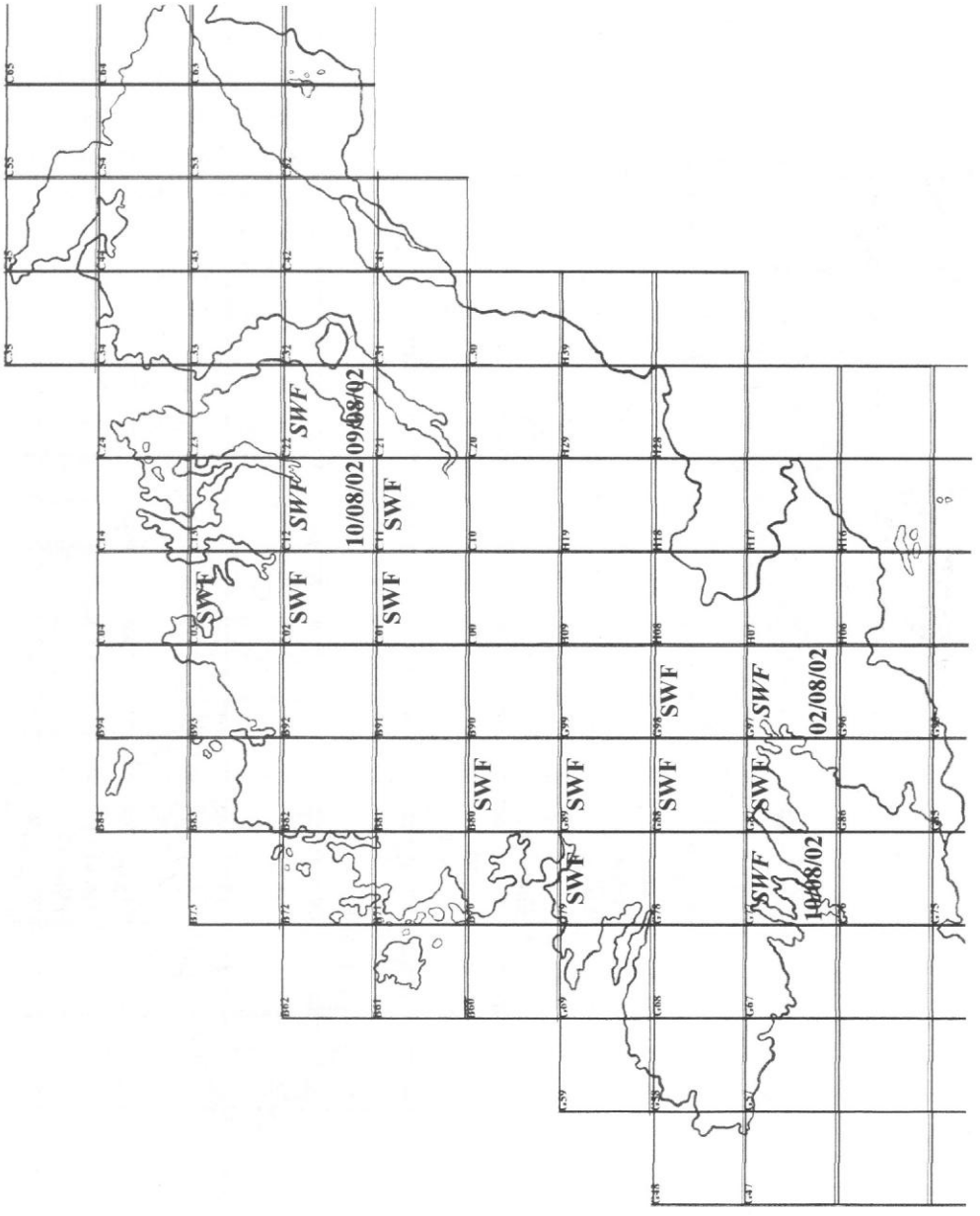


FIGURE 9. Donegal butterflies: Small Blue (SB) 1998-2003.

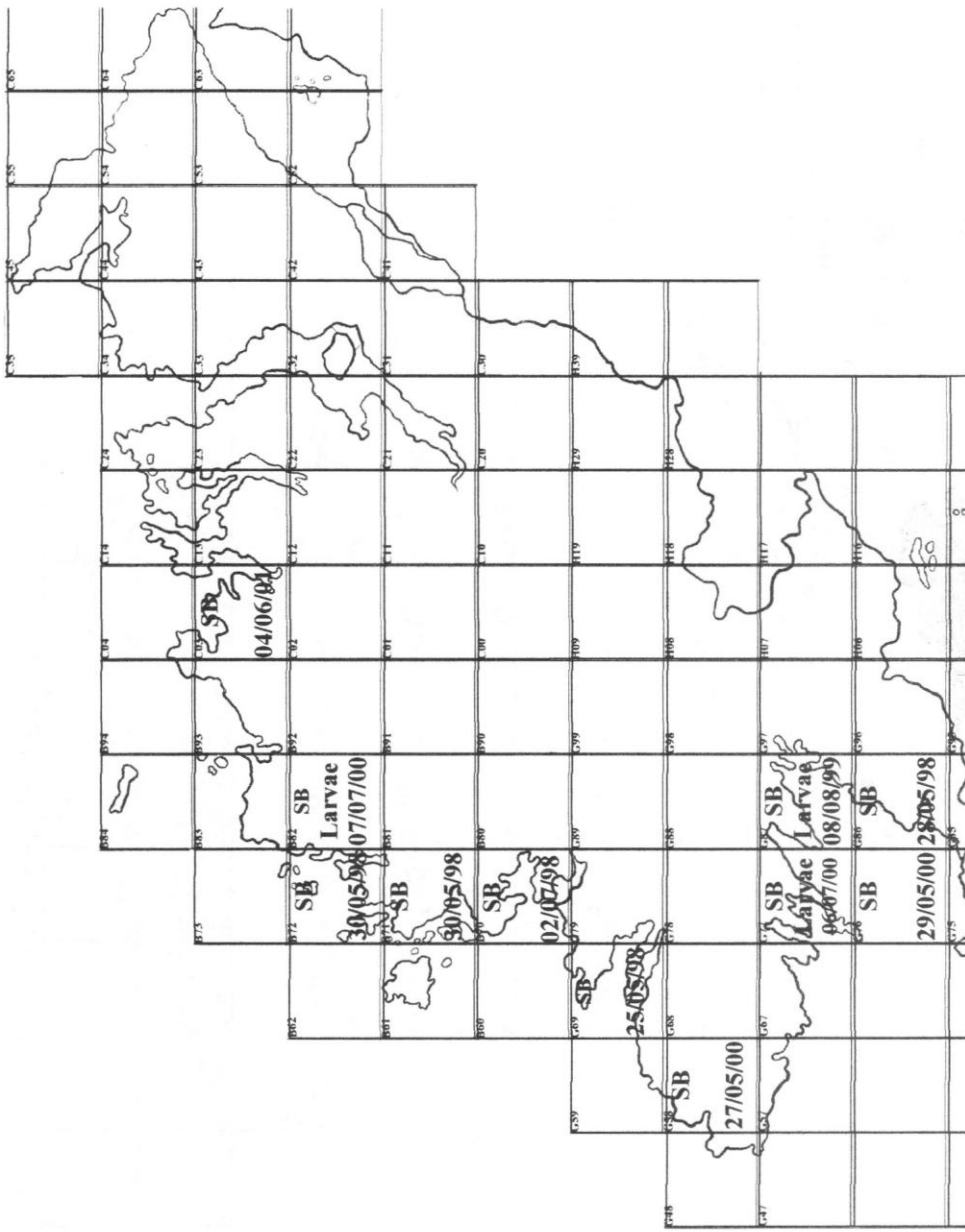


FIGURE 10. Donegal butterflies: Small Heath (SH) 1995-2003.

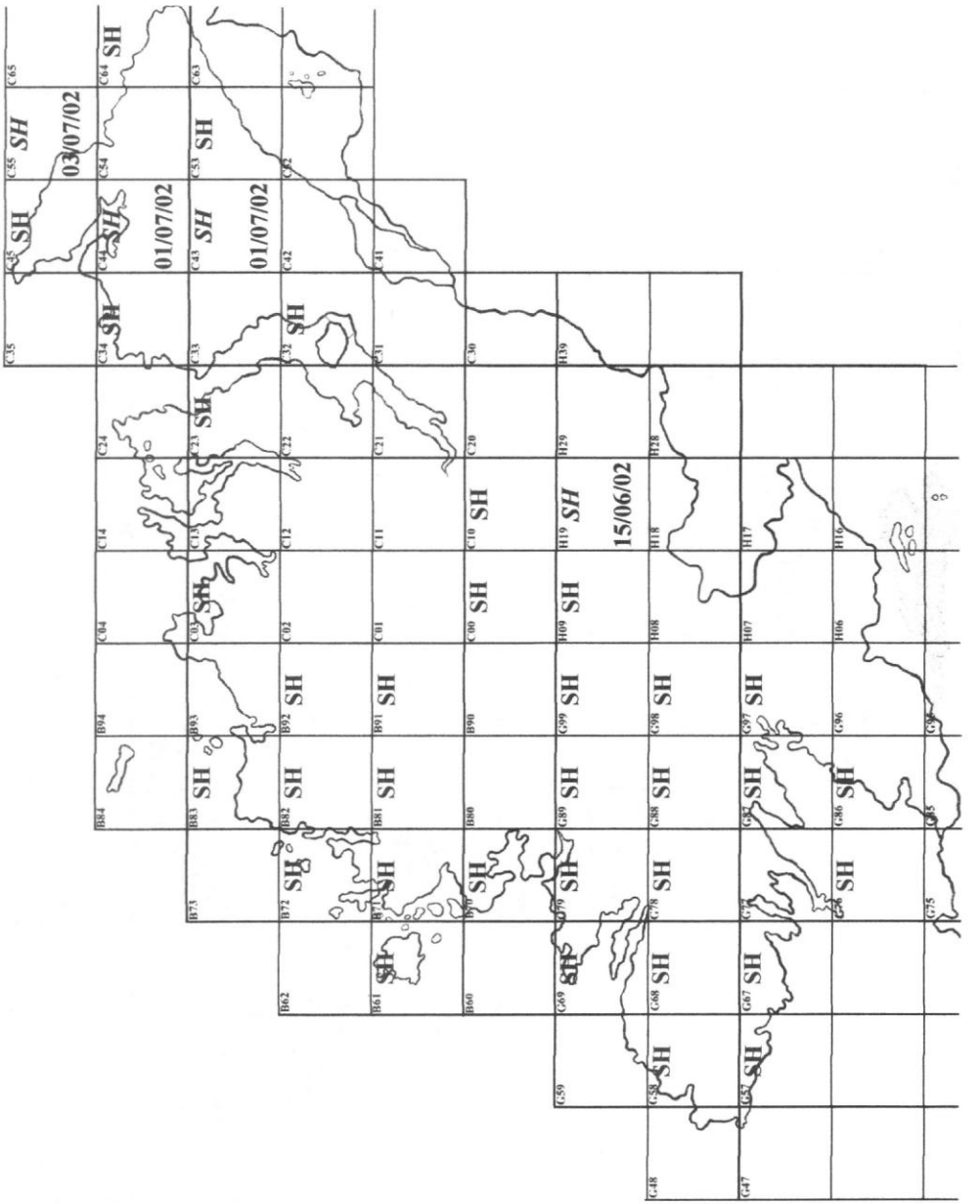


FIGURE 11. Donegal butterflies: Wall Brown (WB) 1995-2002.

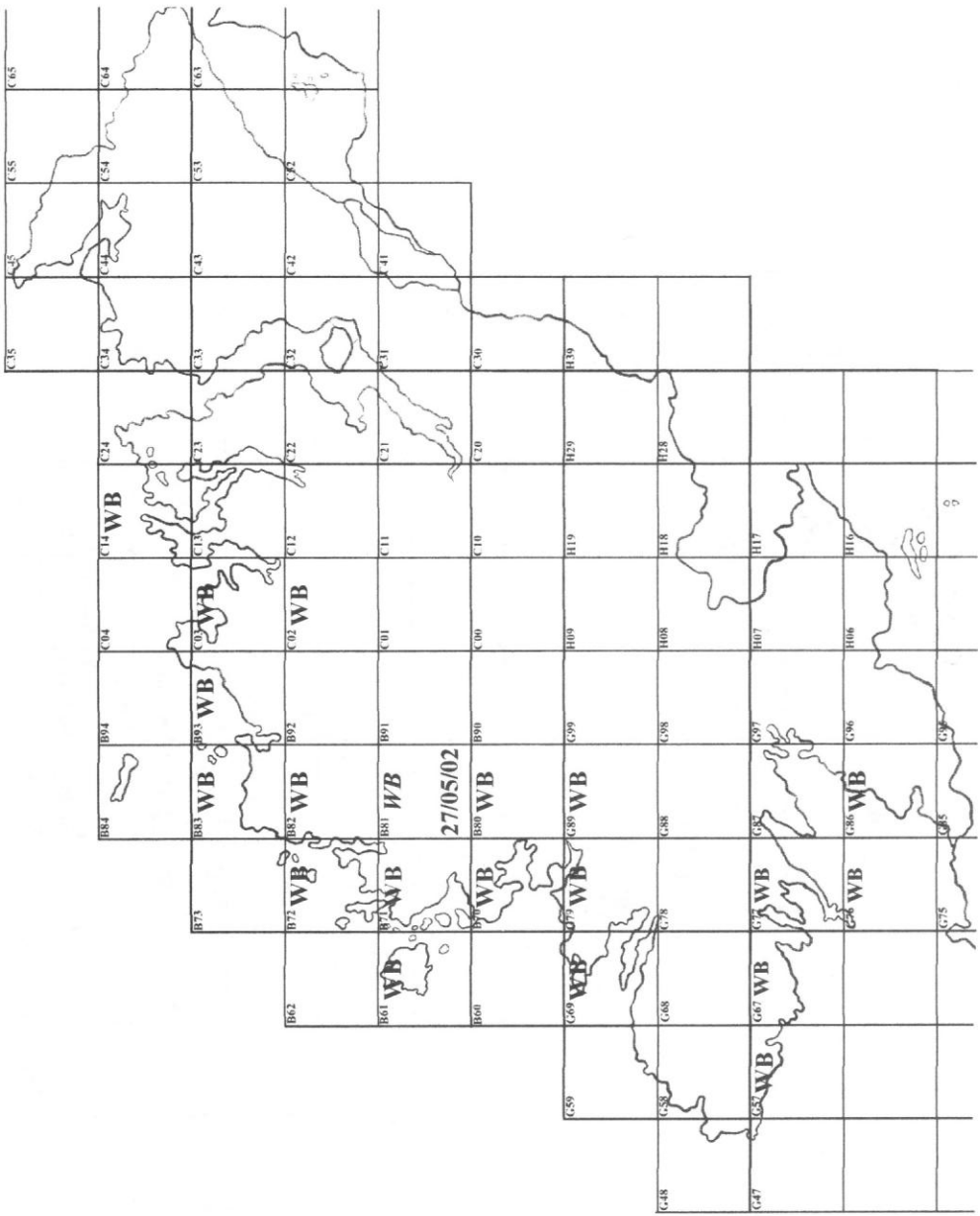
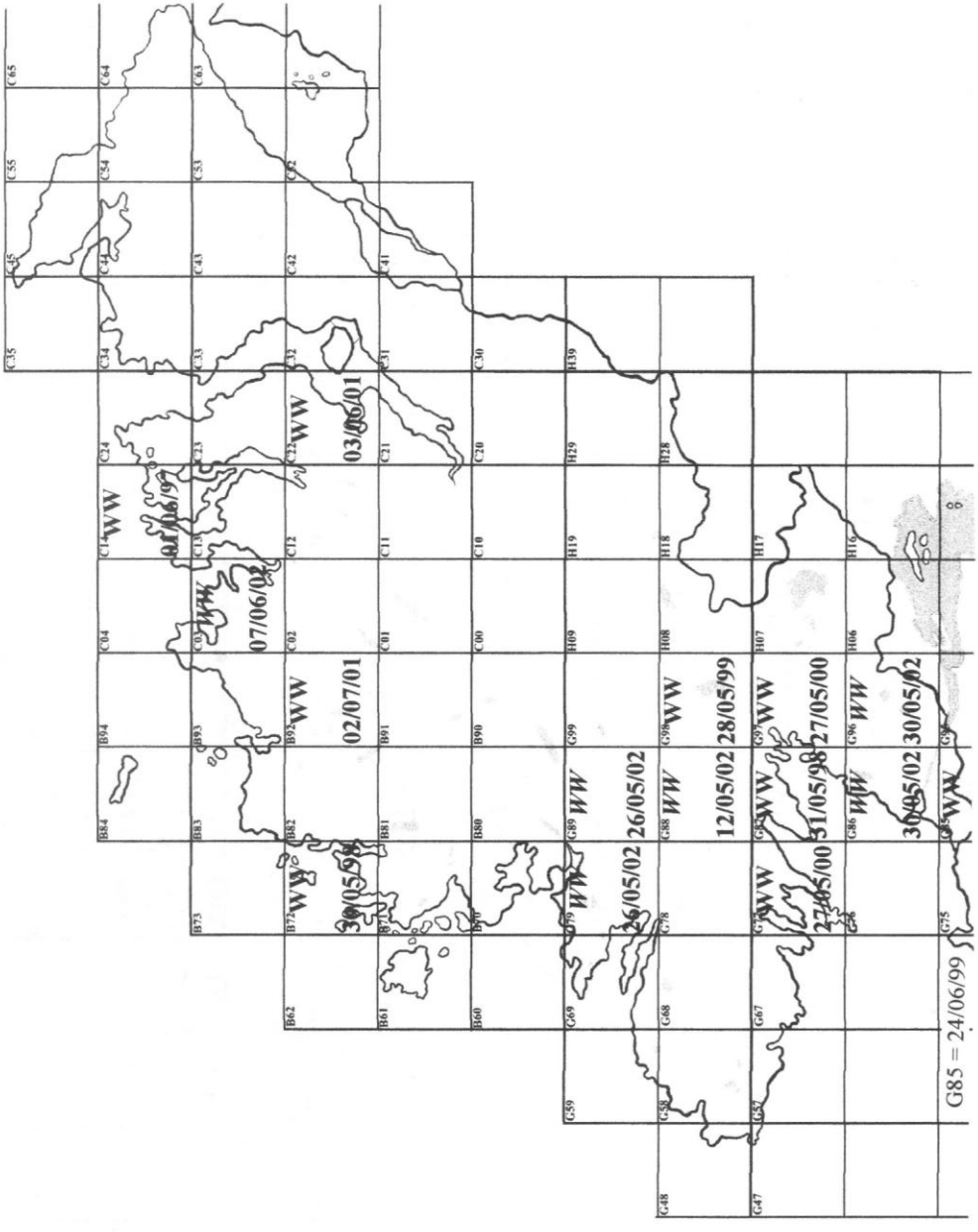


FIGURE 12. Donegal butterflies: Wood White (WW) 1997-2002.



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DISTRIBUTIONAL RECORDS OF SOME ACULEATA (HYMENOPTERA) COLLECTED IN IRELAND FROM 1980-2002

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Introduction

Since the death of A. W. Stelfox in 1969, Ireland's foremost worker on the Aculeate Hymenoptera, there has been relatively little Irish interest in this diverse and important group of insects. His interest was intense, leading to the publication of the national list in 1927. Later, aculeate Hymenoptera became secondary to his work on the parasitic Hymenoptera but he did continue to occasionally publish on them (e.g. 1929, 1930, 1933a, b, 1934, 1938, 1939a, b, 1940, 1942, 1949, 1951, 1955, 1969a, b, c). Other papers on Irish aculeates prior to 1980 are listed in Ryan, O'Connor and Beirne (1984). Since then, contributions have been made by M. Boston, J. Breen, D. C. F. Cotton, R. F. Cotton, R. Edwards, I. McClenaghan, R. Nash, B. Nelson, A. O'Brien, S. P. M. Roberts and the present authors. These are listed in the references. Nelson *et al.* (2002) made additions and changes to the national list but, at present, there is no modern Irish checklist.

A large collection of aculeate Hymenoptera, mostly collected by J. P. and M. A. O'Connor in the early nineteen-eighties, with some specimens from the nineteen-nineties, was recently identified by CR. Determinations were made using the following works:- Amiet *et al.* (1999, 2001) (*Colletes*, *Hylaeus*, *Halictus* and *Lasioglossum*), Archer (2000) (*Ancistrocerus* and *Symmorphus*), Banaszak and Romasenko (1998) (*Osmia*), Bitsch *et al.* (1993, 1997, 2001) (Sphecidae), Perkins, J. F (1976) (*Bethylus*) and Perkins, R. C. L. (1919) (*Andrena* and *Nomada*). The authors decided that it would be worthwhile to publish these records as a contribution towards a new checklist along with details of specimens of the same species collected by CR since the mid nineteen-eighties.

The paper gives details of records for 44 species of Irish aculeate Hymenoptera. The

following families are represented:- the Bethylidae, Pompilidae, Eumenidae, Sphecidae and Apidae. Most of the species are relatively common and widespread in Ireland. A few are restricted by their nesting habitat requirements, others by biological factors. The data listed below are almost all based on specimens, many now in the collections of the National Museum of Ireland. The remainder are in the senior author's reference collection. A small number of records for common species, readily identifiable in the field, are based on records in the senior author's field notebooks. Nomenclature for the flora follows Stace (1995).

Unless otherwise stated, the specimens were determined by CR. The following abbreviations are employed in the text:- CR = C. Ronayne; JMOC = J.P. and M. A. O'Connor; JPOC = J. P. O'Connor; NNR = National Nature Reserve; SW = Stuart Wistow.

BETHYLIDAE

***Bethylus cephalotes* Forster, 1860**

CORK (west) (H03): Garnish Island (V936560), Glengarriff, ♀ 1 July 1985, JMOC. **WEXFORD (H12):** Ballyteige (S9605), ♀ 12 June 1982, on the sand-dunes, JMOC; Fethard (S7905), ♀ 5 July 1991, JPOC. **GALWAY (west) (H16):** Furnace Island (L8324), north of Lettermullan, 2♀♀ 28 January 1998, emerged indoors from an empty trap-nest stem, retrieved from a field on the 28 October 1997, CR. **WICKLOW (H20):** The Murrough (T308959), ♀ 4 April 1988, on the ground at the base of a stone wall on a shingle ridge, CR. **DUBLIN (H21):** Skerries (O247597), 33 Dublin Road, ♀ 6 July 1997, on the leaves of raspberry *Rubus idaeus* L. in the back garden, CR. **LOUTH (H31):** Baltray (O1577), ♀ 2 August 1997, on the sand dunes at the mouth of the River Boyne, CR.

***Bethylus fuscicornis* (Jurine, 1807)**

GALWAY (west) (H16): Cleggan (L6158), ♀ 20 July 1982, JPOC.

POMPILIDAE

***Priocnemis exaltata* (Fabricius, 1775)**

WEXFORD (H12): Carnsore Point (T121038), ♀ 27 August 1980, JPOC; Chour (T0904), west of Carnsore Point, ♂ 12 July 1999, on a sandy area behind a shingle ridge, CR. **LAOIS (H14):** Derry Hills (N2612), ♂ 2♀♀ 15 August 1997, at umbellifer flower heads, CR.

GALWAY (west) (H16): Furnace Island (L8324), north of Lettermullan, ♀ 18 August 2000, in the short vegetation at the base of a rocky outcrop, CR. **OFFALY (H18):** Clonmeen (N5329), south of Rhode, ♂ 2♀♀ 4 August 1998, on umbellifers growing in the cutting for the light railway, CR. **DUBLIN (H21):** Skerries (O245601), a ballast pit by the railway station, ♀ 21 August 1993, on an umbellifer flower head, CR. **MEATH (H22):** Gormanston (O175660), ♂ 21 July 1986, ♀ 20 August 1986 and ♀ 7 August 2000, in an abandoned gravel pit, all CR. **WESTMEATH (H23):** Royal Canal (N618484), south of Croboy Lough, ♀ 7 August 2000, on a bank-side umbellifer, CR. **LOUTH (H31):** Ferrard Cross (O1389), ♂ 30 August 2000, on an umbellifer in a disused marl pit, CR; Giles Quay (J1605), gravel workings east of, ♀ 11 August 1998, collected after emerging from a hole at the base of a sand face in an area of settling ponds beside the Castletown River, CR; Riverstown (J167071), ♀ 30 August 1991, on a sandy bank at the edge of the Castletown River, CR; Togher (O1189), ♀ 9 August 1998, on an umbellifer in a gravel pit north of Togher cross-road CR.

***Priocnemis perturbator* (Harris, 1780)**

WEXFORD (H12): Oaklands (S7125), ♀ 20 April 1990, JPOC. **OFFALY (H18):** Clongarret (N5625), ♀ 6 June 2000, at a spoil heap beside the Phillipstown River, CR. **WICKLOW (H20):** Knocksink Wood NNR (O2117), ♂ 6 April 1995, in a clearing in the oak *Quercus* wood beside the Glencullen River, CR. **MEATH (H22):** south of Knowth (N9972), 2♀♀ 19 April 1988, on a south facing slope above the Boyne River, between Knowth and Newgrange, CR. **LONGFORD (H24):** Lyneen Bridge (N098678), ♀ 22 May 2001, on the embankment of the derelict canal (Royal Canal), CR.

***Pompilus cinereus* (Fabricius, 1775)**

KERRY (H01): Derrynane National Historical Park (V533585), ♀ 7 August 1989, on the sand dunes, CR. **WATERFORD (H06):** Lisselty (X6299), ♀ 29 August 1998, on sand dunes at the base of soft cliffs, CR. **WEXFORD (H12):** Fethard (S7905), ♀ 5 July 1991, JPOC; Raven Point (T1123), ♀ 1 July 1999, on the bare sand in a clearing at the southern end of the reserve, CR. **WICKLOW (H20):** Five-mile Point (O3102), ♀ 18 August 1998, on a bank above the shingle beach, CR. **DUBLIN (H21):** Malahide, The Island (O235475), ♂ 25 July 1995, on the bare sand at the edge of a blow-out, ♀♀ 27 July 1997, both CR. **LOUTH (H31):** Baltray dunes (O1577), ♀ 2 August 1997, on the dunes at the mouth of the River Boyne, also 28 July 1997

and 23 June 1998, all CR.

***Arachnospila anceps* (Wesmael, 1851)**

WATERFORD (H06): Tramore Strand (S598008), ♂ 16 July 1999, on wild carrot *Daucus carota* on a shingle ridge behind the beach, CR. **OFFALY (H18):** Clonmeen (N5329), south of Rhode, ♀ 4 August 1998, on an umbellifer on the side of the cutting of the industrial railway, CR. **WICKLOW (H20):** Five-Mile-Point (O3102), ♀ 18 August 1998, on wild carrot beside the railway near the disused Newcastle station, CR. **DUBLIN (H21):** Malahide, The Island (O235475), ♂ ♀ 25 July 1995, on the bare sand of an old blow-out in the dunes, ♂ 2♀♀ 8 August 1997, in disturbed dunes on the estuary side of the peninsula, both CR; Skerries (O245601), ballast pit north of the railway station, ♀ 30 July 1992, on an umbellifer, ♀ 3 July 1993, on an umbellifer, ♀ 21 August 1993, on an umbellifer flower head in an old gravel pit, all CR. **MEATH (H22):** Gormanston (O178674), gravel pit north of the railway station, ♂ ♀ 20 July 1998, CR; Mornington (O1575), ♀ 15 June 1989, JPOC. **MAYO (west) (H27):** Corryosla bay (G197046), ♀ 22 July 2000, on a sandy shore of Lough Conn, north-west of Pontoon, CR. **LOUTH (H31):** Baltray (O1577), 4♀♀ 28 July 1997, on umbellifers in disturbed dunes at the mouth of the River Boyne, ♂ ♀ 2 August 1997 and ♂ ♀ 24 August 1998, on umbellifers, all CR.

EUMENIDAE

***Ancistrocerus oviventris* (Wesmael, 1836)**

CORK (west) (H03): Bantry House (V985481), ♂ 3 July 1985, in the gardens, JPOC. **CLARE (H09):** Ballyeighter (R346940), ♂ 29 May 1984, JMOC; Ballynalackan (M1000), ♀ 31 May 1984, JPOC; Lisdoonvarna (R134979), ♂ 8 July 1981, in the grounds of the Spa, visiting a flowerbed, JPOC. **WEXFORD (H12):** The Cull (S937068), north of Ballyteige Burrows, ♀ 11 July 1999, collected while flying along a wall beside a pump-house, CR. **LAOIS (H14):** Glenbarrow (N362075), ♀ taken others seen 24 June 2001, in a narrow river valley, with sparsely vegetated glacial-till slopes and conifer plantations, CR. **GALWAY (west) (H16):** Derryclare (L835504), north of Recess, ♂ 23 June 1997, exploring holes in the face of a dry peat bank to the west of oak woodland, CR; Furnace Island (L8324), north of Lettermullan, ♀ (pale form, (?) var. *hibernicus*) 13 July 1997, near a rock outcrop in pasture, ♂ ♀ 3 July 1998,

flying low in the shelter of a stone wall beside the road, both CR; Gorumna Island (L865220), south of Ballynakill Lough, ♀ 17 July 2000, at brambles *Rubus* at the edge of a track around the lake, CR. **OFFALY (H18):** Bunakeeran (N215205), wetland, ♂ taken 2♀♀ seen 24 June 2001, at nests on boulders in bare marly-clay at the edge of recently constructed wetlands, CR. **KILDARE (H19):** Kings Bog (N7108), south of Kildare, 2♂♂ ♀ 16 June 1998, flying in a clearing in a conifer plantation growing on a cut-over bog, CR. **WICKLOW (H20):** Enniskerry (O219173), the Powerscourt estate, ♂ 24 June 1995, in a sand pit cleared for a housing development, CR; King's River valley (O008018), 2♂♂ 16 June 1998, flying beside a track in a felled Spruce *Picea* plantation, CR. **DUBLIN (H21):** Blakes Cross (O198520), Lusk, 2♂♂ ♀ 11 June 1988, flying around a wall of an old shed, CR; Drumanagh (O273560), south-facing cliffs at, ♂♂ ♀♀ 5 June 2002, common flying along a slope above the sea. Many were carrying large numbers of mites, suggesting that they had recently emerged from the nest cells, CR; Skerries (O246600), by the railway station, ♀ 16 June 1996, searching a steep slope in an abandoned gravel pit, CR; Skerries (O247597), back garden, ♂ 19 July 1996, flying around bramble foliage, ♂ 16 July 2001, taken at bramble, CR. **LOUTH (H31):** Baltray (O1577), sand dunes, ♀ 28 July 1997, flying close to a stunted hawthorn *Crataegus* bush in a disturbed area of the dunes, CR; Ferrard Cross (O1389), ♀ 13 June 1989, in an abandoned marl pit, CR; Togher (O118895), ♀ 13 June 1988, in a disused gravel pit, CR.

***Symmorphus bifasciatus* Linnaeus, 1761**

CORK (west) (H03): Bantry House (V985481), ♀ 3 July 1985, swept in the gardens, JPOC; Glengarriff (V907575), ♂ 6 July 1985, swept in the woodland, JMOC. **WATERFORD (H06):** Knockaderry Reservoir (S495065), 2♀♀ 11 August 2000, on umbellifers, CR. **WEXFORD (H12):** Forth Mountain (S9718), west of Wexford, ♀ 7 August 1998, on an umbellifer at the side of a minor road, CR. **LAOIS (H14):** Derry Hills (N265128), 2♀♀ 28 June 2000, at a fence post, CR. **OFFALY (H18):** Ballindown (N072077), ♂ taken others seen 21 June 2001, at dead wood at the northern edge of a shallow lake, CR; Durrow Abbey, south of (N312297), ♀ 10 August 1991, in coniferous plantation, CR; Toberdaly Bridge (N526312), ♀ 28 August 2000, on an umbellifer, CR. **KILDARE (H19):** Newbridge Fen (N767166), 2♂♂ 11 July 1982, JMOC. **WICKLOW (H20):** Clara Vale (T182916), ♂ 30 June 2001, at an umbellifer beside a track in the oak wood, CR; Knocksink Wood NNR (O2117), Enniskerry, ♂ 6 July

1993, on an umbellifer at the edge of the decidous wood, CR; Powerscourt estate (O219173), Enniskerry, ♀ 24 July 1995, CR. **MEATH (H22):** Herbertstown bridge (O114637), ♀ 5 July 1997, CR; Royal Canal near Croboy Lough (N6248), ♀♀ 7 August 2000, common on umbellifers, CR; Thomastown Bog (O008687), west of Duleek, ♂ 30 June 1998, ♀ 7 July 1997, both CR. **WESTMEATH (H23):** Ardmorney esker (N368368), east of Kilbeggan, ♀ 17 July 1997, in an old quarry/gravel pit in the side of the esker ridge, CR. **LONGFORD (H24):** Ballin Lough (N271818), ♀ 27 June 2000, at the edge of a track to the lake, CR.

SPHECIDAE: CRABRONINAE

***Crossocerus capitosus* (Shuckard, 1837)**

CORK (west) (H03): Bantry House (V985481), ♂ 3 July 1985, in the gardens, JPOC. **WATERFORD (H06):** Ballin Lough (S4403), ♂ 18 June 1990, JMOC. **WEXFORD (H12):** Ballylane (S7324), near New Ross, ♂ 12 July 1991, JPOC. **MEATH (H22):** Drumman House (O005689), west of Duleek, ♀ 7 July 1997, on the foliage of a large ash *Fraxinus* in the garden of a derelict house, 2♀♀ 15 July 1998, flying around the foliage of an ash, both CR.

***Crossocerus dimidiatus* (Fabricius, 1781)**

WATERFORD (H06): Malcolmson's Wood (S6800), Dunmore East, ♂ ♀ 30 June 1983, JPOC. **GALWAY (west) (H16):** Furnace Island (L8324), ♀ 6 July 1998, entering a cavity between the stones in the foundation plinth of a house, CR. **OFFALY (H18):** Derry Bridge (N151226), Grand Canal, 4♂♂ 16 June 2000, at the foliage of a large sycamore *Acer pseudoplatanus* beside the bridge, CR. **WICKLOW (H20):** Devil's Glen (T2398), Ashford, ♀ 3 August 1986, in a narrow, steep-sided, wooded river-valley, CR; Knocksink Wood NNR (O2117), Enniskerry, ♀ 24 July 1995, at the side of a track near the entrance to the reserve, CR. **DUBLIN (H21):** Skerries (O247597), 33 Dublin Road, ♀ 23 June 1986 and ♂ 23 June 1987, back garden, both CR; Skerries (O245601), a ballast pit by the railway station, ♀ 3 July 1993, on the leaves of an ash, CR; Slade of Saggart (O033245), 3♂♂ 18 July 1982, river bank, JMOC. **MEATH (H22):** Gormanston (O175660), ♀ 21 July 1986, in a gravel/sand pit, CR; Herbertstown Bridge (O114637), west of Greenanstown, 2♂♂ 5 July 1997, flying around ivy *Hedera helix* at the base of a stone bridge, CR; Obelisk Bridge (O0475), west of, ♂ 7 August 1997, on ash leaves beside the disused canal, CR. **WESTMEATH (H23):** Lough Bane

(N416775), ♂♂ 27 June 2000, flying around birch *Betula* at the edge of a cut-over bog near the lake, CR. **ROSCOMMON (H25):** Duggarry Bog (M9636), ♀ 17 July 1997, on an umbellifer growing in a deep drainage ditch at the edge of the cut-over raised bog, CR. **LOUTH (H31):** Giles Quay (J1605), east of, ♀♀ 11 August 1998, nesting in a sandy bank, CR; Togher (O118895), east of Dunleer, ♀ 17 August 1987, in a gravel/sand pit, 2♂♂ ♀ 13 June 1988, in a gravel/sand pit, CR.

***Crossocerus megacephalus* (Rossius, 1790)**

CORK (west) (H03): Garnish Island (V936560), Glengarriff, ♂ 1 July 1985, JMOC. **WEXFORD (H12):** Mount Garret (S720305), ♀ 17 June 1982, in mixed wood, JMOC; The Raven NNR (T1123), south-east of Curracloe, ♀ 14 July 1999, on the leaves of sycamore at the edge of the dunes at the Raven Point, ♂ 17 July 1999, at the edge of a clearing at the southern end of the Raven, ♂ 31 July 1999, at a sycamore in a clearing, all CR. **LAOIS (H14):** Derry Hills (N2612), ♀ 9 September 1999, on oak foliage in oak woodland on the moraine hills, CR. **WICKLOW (H20):** Clara Vale (T1891), the oak woods, ♀ 5 June 1998, flying close to a bramble bush, CR; Devil's Glen woods (T2498), ♂ 4 June 1998, in mixed woodland, CR; Kilmacanoge (O2514), ♂ 15 August 1982, in the alder *Alnus* marsh/stream, JMOC; Knocksink Wood NNR (O212183), Enniskerry, ♀♀ 30 June 1995, nesting in a dead conifer trunk, in an area cleared of conifers and reverting to scrub, CR; Russellstown Park (N964110), ♀ 15 August 2002, on a bramble flower at the edge of willow *Salix*/alder scrub, CR. **DUBLIN (H21):** Ardgillen Park (O2161), north-west of Skerries, ♀ 5 July 1994, on the west facing wall in a walled garden, CR; Milverton (O230597), Skerries, ♀ 29 September 1987, on the leaves of bramble in a hedgerow beside the road, CR; Skerries (O247597), 33 Dublin Road, ♂ 5 August 1986, in the back garden, ♀ 14 August 1987, flew out of a rotten window frame lying against a wall (later found cocoons in the same section of the frame), 2♂♂ 29 September 1987, reared (indoors) from cocoons found in a rotten window frame in the back garden, ♀ 23 July 1988, in the back garden, on a bramble flower, ♂ 3 August 1991, in the back garden, ♂ ♀ 11 July 1993, emerged from a trap-nest in the back garden; ♂ ♀ 19 May 2002, on blackcurrant *Ribes nigrum* L. foliage in the garden during a period between heavy rain, all CR. **MEATH (H22):** Drumman House (O005689), west of Duleek, ♀ 6 August 1997, at a dead tree covered with ivy, at the edge of a pasture, CR; Thomastown Bog (O008687),

west of Duleek, ♀ 4 June 1997, in a Malaise trap set in a clearing in wet woodland, 2♂♂ 19 June 1997, in holes in a dead tree stump, ♂ 5 June 1999, reared (at ambient outdoor temperature) from seven *Crossocerus* type cocoons in a piece of dead willow which was felled 14 October 1998 at the edge of wet woodland, all CR.

***Crossocerus quadrimaculatus* (Fabricius, 1793)**

KILKENNY (H11): Norelands House (S5443), bridge near, ♀ 1 August 1994, SW. **WEXFORD (H12):** Raven Point NNR (T115230), ♂ 31 July 1999, in a clearing at the southern end of the reserve, CR. **GALWAY (west) (H16):** Letterfrack (L710575), ♂ 24 July 1982, JMOC. **GALWAY (north east) (H17):** Mountsilk (M597500), ♂ 29 July 2001, at nesting holes in a low vertical sandy face in a disused gravel pit, CR. **WICKLOW (H20):** Knocksink Wood NNR (O2117), Enniskerry, ♂ 5 August 1993, at the side of a track into the reserve, 3♂♂ 10 September 1996, at a sandy cutting at the entrance to the reserve, CR. **MEATH (H22):** Gormanston Railway Station (O178674), north of, ♂ 20 July 1998, in a disused gravel pit just north of the station, CR; near Gormanston (O175660), ♀ 31 July 1999, in a gravel pit, CR. **LOUTH (H31):** Giles Quay (J1605), east of, ♂ 11 August 1998, in gravel/sand workings by the Castletown River, CR; Togher (O118895), east of Dunleer, ♂ 17 August 1987, in a gravel/sand pit just north of the crossroads, ♂ 9 August 1998, in a disused sand/gravel pit just north of the Togher crossroads, both CR.

***Crossocerus wesmaeli* (Vander Linden, 1829)**

WATERFORD (H06): Tramore Strand (S598008), ♂ ♀ 16 July 1999, on spurge *Euphorbia* on a shingle ridge at the top of the beach, CR. **CLARE (H09):** Fanore (M1308), ♀ 31 July 1988, on the sand dunes, JPOC. **WEXFORD (H12):** Ballyteige Burrows (S9306), ♂ 9 July 1999, on an umbellifer in the sand dunes, CR; Curracloe Beach (T114270), ♂ 14 July 1999, at an umbellifer in the dunes above the beach, to the north of the Raven NNR, CR; Grange strand (S8006), north-east of Fethard, ♀ 13 July 1999, on wild carrot at the edge of some low sand dunes, CR; The Raven NNR (T1123), southern end of, ♀ 14 July 1999, at sea spurge *Euphorbia paralias* on sand dune, CR; The Raven NNR (T1126), northern end of, 12 2♂♂ July 1999, on umbellifers in the dunes at the eastern edge of the pine *Pinus* plantation, CR; Raven Point (T1124), ♂ 29 June 1978, D. N. Dowling. **DUBLIN (H21):** Malahide (O235475), 'The Island' sand dunes, 3♂♂ ♀ 19 July 1994, on the leaves of willow scrub, ♂ 8 August 1997, on

an umbellifer in the middle of the dunes near the tip of the peninsula, both CR. **MEATH (H22):** Mornington (O1575), ♀ 15 June 1989, JPOC. **LOUTH (H31):** Baltray (O1577), ♂ 28 July 1997, on an umbellifer in the dunes, ♂ 26 June 2000, both CR.

***Ectemnius cavifrons* (Thomson, 1870)**

WEXFORD (H12): Forth Mountain (S9718), ♀ 7 August 1998, at an umbellifer in an area of heath and a conifer plantation, CR; The Raven NNR (T1123), south-east of Curracloe, ♂ 17 July 1999, at the edge of a clearing at the southern end of the reserve, ♀ 31 July 1999, in a clearing at the southern end of the reserve, both CR; Tintern Abbey (S7810), ♂ 15 June 1990, JPOC. **OFFALY (H18):** Clongarret (N5625), west of Clonbulloge, ♂ 4 August 1998, on an umbellifer at the edge of a conifer plantation, CR. **WICKLOW (H20):** Knocksink Wood NNR (O2117), Enniskerry, ♀ 24 July 1995, on an umbellifer at the edge of a track near the entrance to the reserve, CR. **DUBLIN (H21):** Ardgillen Park (O2262), north-west of Skerries, ♀ 11 September 1991, flying among ash and beech *Fagus* trees, CR; Phoenix Park (O0935), ♀ 23 August 1985, in a decaying elm *Ulmus* tree-stump, JPOC; Skerries (O247597), 33 Dublin Road, ♀ July 1985, ♀ 18 September 1990, ♂ 29 June 1994, ♂ 6 July 1997 in the back garden, ♂ 11 July 1993, ♂ 20 July 1994, flying around Raspberry *Rubus idaeus* canes in back garden, ♂ 8 July 2002, in the back garden investigating dead wood, all CR. **MEATH (H22):** Herbertstown Bridge (O114637), 2♂♂ 5 July 1997, flying around the base of an ivy-covered stone bridge in a stream valley, CR; Obelisk Bridge (O0475), west of, ♂ ♀ 7 August 1997, on an umbellifer on the bank of a disused canal, CR; Thomastown Bog (O008687), ♂ 7 July 1997, in a Malaise trap set up in a clearing in wet woodland, CR. **MAYO (west) (H27):** Toormakeady (M095670), 1km south, ♂ 28 July 2001, on an umbellifer in open hazel *Corylus* scrub, on a limestone shore of Lough Mask, CR. **LOUTH (H31):** Baltray dunes (O1577), ♂ 2 August 1997, flying around dead and loose tree stumps, CR.

***Rhopalum clavipes* (Linnaeus, 1758)**

WEXFORD (H12): Ballylane (S7324), New Ross, ♂ 12 July 1991, JPOC. **LAOIS (H14):** Glenbarrow (N363076), south-west of Rosenallis, ♀ 15 August 1997, on an umbellifer in a wooded river valley, CR. **KILDARE (H19):** Castletown (N975345), ♂ 8 August 1982, in a mixed wood, JMOC. **WICKLOW (H20):** Coolattin Wood (T018692), ♂ 14 September 1984, JPOC; Kilmacanoge (O2514), ♀ 15 August 1982, alder marsh/stream, JMOC. **DUBLIN (H21):**

Skerries (O247597), 33 Dublin Road, ♀ 11 August 1991, ♂ 6 August 2001, in the back garden, ♀ 3 June 1997, emerged from a trap-nest hanging in the back garden, ♀ 3 August 1997, in a piece of dead wood brought in from the garden, all CR. **MEATH (H22):** Kilmessan (N8858), ♂ 18 August 1991, along a hedgerow, JMOC.

***Rhopalum coarctatum* (Scopoli, 1763)**

CORK (east) (H05): Fota Island (W787710), ♂ 8 July 1985, JMOC. **MEATH (H22):** Thomastown Bog (O008687), ♂ ♀ 19 June 1997, the male was flying around oak foliage and the female was taken in a Malaise trap in a clearing in wet woodland, ♀ 7 July 1997, in a Malaise trap, all CR. **MAYO (east) (H26):** Carrownagower (M145593), ♂♂ 25 June 2002, flying among stunted hazel scrub, on the south bank of the canal in a limestone karst area, CR.

SPHECIDAE: PEMPHREDONINAE

***Spilomena differens* Blüthgen, 1953**

CORK (west) (H03): Bantry House (V985481), ♀ 3 July 1985, in the gardens, JPOC. **WEXFORD (H12):** J. F. Kennedy Park (S7319), ♀ 14 July 1987, JPOC. **OFFALY (H18):** Toberdaly Bridge (N526312), Grand Canal, ♀ 24 August 2000, on sycamore foliage beside the canal path, CR. **MEATH (H22):** Thomastown Bog (O008687), ♀ 6 August 1997, in a Malaise trap, in a clearing in wet mixed woodland, CR.

***Pemphredon lugubris* (Fabricius, 1793)**

KERRY (north) (H02): Galway's Bridge (V914801), Killarney National Park, ♀ 7 July 2001, on oak foliage at the edge of a track above the bridge, CR. **CORK (west) (H03):** Bantry House (V985481), ♀ 3 July 1985, in the gardens, JPOC; Garnish Island (V936560), Glengarriff, ♂ ♀ 1 July 1985, JMOC. **KILDARE (H19):** Ballynafagh Reservoir (N8128), north-west of Prosperous, ♂ July 1998, reared (at outdoor ambient temperature), from a piece of dead willow wood collected on 4 February 1998 at the edge of a reedbed, CR. **WICKLOW (H20):** Knocksink Wood NNR (O2117), Enniskerry, ♂ 24 June 1995, hand-netted while flying at the edge of an entrance track to the reserve, CR. **DUBLIN (H21):** Howth (O2738), near Muck Rock, ♂ 2 July 1994, on the leaves of an ash tree in a clearing in mixed woodland, CR; Skerries (O247597), 33 Dublin Road, ♀ 11 May 1993, hand-netted while flying around raspberry foliage, CR. **MEATH (H22):** Drumman House (O005689), west of Duleek, ♀ 25

July 1997, emerged from a hole in the stub of a dead branch on an oak tree, CR; Thomastown Bog (O008687), west of Duleek, ♀ 7 July 1997, 2♀♀ 25 July 1997, in Malaise trap set up in damp woodland, both CR.

SPHECIDAE: NYSSONINAE

***Mellinus arvensis* (Linnaeus, 1758)**

CORK (west) (H03): Coolcolaughta (V940402), south of Durrus, 2♀♀ 1 August 2001, in the glass porch of a house, CR.

CLARE (H09): near Ailwee Cave (M233049), 2♂♂ ♀ 9 August 1999, nesting in a gravel heap in a laneway, JPOC. **WEXFORD (H12):** Curracloe Beach (T114270), north of the Raven NNR, ♀ 12 July 1999, near a stunted sycamore in fixed dunes, CR. **LAOIS (H14):** Derry Hills (N2612), 6km west-north-west of Clonaslee, ♂ ♀ 15 August 1997, flying close to birch foliage in an area of scrub, CR; The Derries (N586050), ♀ 20 September 1982, in a mixed wood. JPOC. **GALWAY (west) (H16):** Kylemore (L7558), ♂ 25 July 1982, JMOC; Rosleague House (L6857), ♂ 24 July 1982, JMOC. **WICKLOW (H20):** Devil's Glen Wood (T2498), north-west of Ashford, ♀ 23 September 1997, on a sunny bank, CR; Knocksink Wood NNR (O216179), Enniskerry, ♂ ♀ 5 August 1993, in a clearing in secondary ash and hazel woodland, CR. **DUBLIN (H21):** Malahide (O235475), 'The Island', ♂ 19 July 1994, on the leaves of a willow at the edge of the golf course on the west side of the peninsula, ♂ ♀ 22 July 1997, both CR; Skerries (O245601), ballast pit beside railway station, ♀ 24 August 1986, at the foliage of an ash in a disused sand/gravel pit, CR. **MEATH (H22):** Gormanston (O175660), a gravel pit beside the Delvin River, ♂ ♀ 14 August 1987, at a sandy bank in the abandoned gravel pit, CR; Gormanston (O177674), a gravel pit north of the railway station, 2♀♀ 24 August 1986, at a sandy bank in the disused gravel pit, CR. **LOUTH (H31):** Baltray (O1577), dunes, ♂ ♀ 28 July 1997, on the leaves of a stunted sycamore growing above the river bank near the mouth of the River Boyne; Togher (O118895), east of Dunleer, ♂ ♀ 17 August 1987, in an abandoned gravel pit, CR.

***Nysson spinosus* (Forster, 1771)**

WEXFORD (H12): Killoughrim (S8941), ♀ 16 June 1982, oak woodland, JMOC; Mount Garret (S720305), ♀ 17 June 1982, in a mixed wood, JMOC. **CARLOW (H13):** Bahana

woods (S7239), ♀ 14 June 1991, JMOC. **WICKLOW (H20):** Knocksink Wood NNR (O214181), Enniskerry, ♂ 30 June 1995, found dead on the ground in a clearing beside the river opposite the beech plantation; Knocksink Wood NNR (O216179), Enniskerry, ♀ 8 June 1993, flying low down at the edge of a clearing in secondary ash/hazel woodland, CR.

***Argogorytes mystaceus* (Linnaeus, 1761)**

CORK (east) (H05): Glansheskin wood (R842044), near Kilworth, ♂ 30 June 1985, JPOC. **WEXFORD (H12):** Killoughrim (S8941), ♂ 16 June 1982, JMOC; Oaklands (S718259), 3♀♀ 18 June 1982, JMOC; Raven NNR (T1123), ♀ 20 July 2002, nesting in the overgrown bank at the edge of a track in a mature conifer wood on the former sand dunes, CR. **WICKLOW (H20):** Clara Vale oakwoods (T1891), ♂ 5 June 1998, CR. Knocksink Wood NNR (O218178), Enniskerry, ♀ 5 July 1993, flying slowly among herbaceous plants on the bank above the main track, CR.

APIDAE: COLLETINAE

***Colletes floralis* Eversmann, 1852**

WATERFORD (H06): Lisselty (X6299), west of Dunmore East, ♀ 15 July 1999, at an umbellifer on a sandy area below soft-rock cliffs, CR; Tramore Burrows (S615003), ♂ 16 July 1999, at wild carrot in an area of high dunes, CR; Tramore Strand (S598008), ♂ 16 July 1999, at wild carrot on a shingle ridge above the beach, CR. **WEXFORD (H12):** Ballyteige Burrows NNR (S9306), ♀ 11 July 1999, at wild carrot, CR; Curracloe (T1127), ♂ 13 June 1991, JMOC; Curracloe Beach (T114270), north of the Raven NNR, 2♂♂ ♀ 14 July 1999, at umbellifers in an area of fixed dunes, CR; Raven Point NNR (T1123), ♀ 17 July 1999, at the base of a dune front at the southern end of Raven Point, CR. **WICKLOW (H20):** Devil's Glen Woods (T2498), north-west of Ashford, ♂ 30 May 1997, at a yellow composite at the edge of a track before the car-park, CR; Five-Mile Point (O3102), south-east of Newcastle, ♂ 30 May 1997, at a yellow composite between the railway and the top of the shingle beach, CR. **DUBLIN (H21):** Skerries (O245601), ballast pit north-east of the railway station, ♂ 3 July 1993, on the south facing- sandy bank in a disused gravel pit, ♂ ♀ 16 June 1996, at the northern side of a gravel pit (south facing-sandy bank), both CR. **LOUTH (H31):** Baltray (O1577), ♂ 4♀♀ 28 July 1997, on umbellifer flower heads in the sheltered areas of the dunes,

♂ 23 June 1998, in an area of fixed dunes, ♀ 24 August 1998, on wild angelica *Angelica sylvestris* in an area of fixed dunes, all CR.

***Hylaeus communis* Nylander, 1852**

WICKLOW (H20): Kilmacanoge (O2514), ♀ 15 August 1982, in the alder marsh, JMOC; Knocksink Wood NNR (O211183), Enniskerry, 2♂♂ 4 June 1997, on the flowers of greater stitchwort *Stellaria holostea* in a clearing by a ruined cottage, CR. **DUBLIN (H21):** Castleknock (O089377), ♀ 25 June 1988, in a suburban garden, JMOC; National Botanic Gardens (O148375), Glasnevin, 2♀♀ 2 August 1981, JPOC (det. G. R. Else); Skerries (O247597), 33 Dublin Road, ♂ 5 May 1993, in the back garden on bramble leaves, ♀ 12 July 1993, on bramble flowers, ♂ 16 August 1999, at French Crane's-bill *Geranium endressii* in the garden, ♂♂ 9 June 2001, flying around a nesting site (raspberry stem bundles) in the back garden, ♀ 27 August 2001, in the back garden at a nest in a *Rubus* stem (a female of *Gasteruption assectator* (L.) close by), all CR. **MEATH (H22):** Drumman House (O005689), west of Duleek, ♂ 4 June 1997, on *Cotoneaster* growing against a wall of a derelict house, CR.

***Hylaeus confusus* Nylander, 1852**

CORK (west) (H03): Glengarriff (V907575), north-west of, ♂ 6 July 1985, in oak woodland, JMOC; near Glengarriff (V920565), ♀ 12 July 1985, in oak woodland, JMOC; Sheep's Head (V731340), ♂ ♀ 3 July 1985, JPOC. **CLARE (H09):** near Ailwee Cave (M233049), ♂ 6 June 1992, JPOC. **WEXFORD (H12):** Raven Point NNR (T1123), south-east of Curracloe, ♂ 12 July 1999, on a yellow Compositae in a clearing at the southern end of Raven, 3♀♀ 31 July 1999, nesting in a dead bramble stem, both CR. **WICKLOW (H20):** Clara Vale NNR (T1891), 2♂♂ 5 June 1998, in open oak woodland in the valley of the Avonmore River, CR; Devil's Glen Wood (T2498), north-west of Ashford, ♀ 30 May 1997, at a yellow composite *Hieracium* sp. beside the main track before the car-park, CR.

APIDAE: ANDRENINAE

***Andrena bicolor* Fabricius, 1775**

WATERFORD (H06): Cheekpoint (S675132), ♀ 31 August 1985, in a forestry car-park on Cheekpoint Hill, CR. **CLARE (H09):** Corofin (R2888), ♀ 22 April 1984, JPOC. **GALWAY (west) (H16):** Furnace Island (L8324), north of Lettermullan, ♀ 3 July 1998, at a bramble

flower growing in old pasture, CR; Gorumna Island (L865220), south of Ballynakill Lough, ♂ ♀ 17 July 2000, at trackside bramble flowers, CR. **GALWAY (north east) (H17):** Mountsilk (M597500), north-west of, ♂ 29 July 2001, at hawkbit *Leontodon* in a gravel pit, CR. **WICKLOW (H20):** Knocksink Wood (O210186), landslide area in, ♀ 30 June 1995, at a yellow composite in an area of soft glacial till escarpment, CR; Knocksink Wood (O218176), the main track, ♂ 24 July 1995, at the side of the track leading into the reserve, CR; Knocksink Wood (O218179), Reserve building, ♀ 28 July 1995, on hawkweed *Hieracium* at the side of a track near the building, CR; Knocksink Wood (O220176), the entrance, ♂ 26 July 1996, near a sandy cutting close to the Reserve entrance, CR; The Murrough (T3097), south-east of Clonmannon, ♂ 8 April 1997, flying near yellow Compositae, growing on a dry shingle ridge, CR; Woodenbridge (T175781), west of, ♂♂ 3 May 2000, flying at willow catkins in woodland by the Aughrim River, CR. **DUBLIN (H21):** Ardla dump (O2360), Milverton, ♂ 17 July 1994, at bramble flowers growing at the side of a track; Drumanagh (O270557), south of Loughshinny, ♀ 31 March 1997, ♂ 17 April 1997, ♀ 28 April 2002, on dandelion *Taraxacum* at the top of a boulder-clay cliff, CR; Skerries (O247597), back garden, ♂ 21 March 1993, on *Narcissus*, ♀ 24 April 1993, at early raspberry flower, ♀ 29 April 1994, at Morello Cherry blossom, 2♀♀ (♂♂ seen) 28 April 2001, nesting in the soil in back garden, and visiting dandelion and Morello Cherry blossom, ♂ 20 July 2001, at perennial cornflower *Centaurea montana*, ♀ 26 August 2001, at devil's-bit scabious *Succisa pratensis*, ♀ 1 May 2002, at cowslip *Primula veris*, all CR. **MEATH (H22):** near Newgrange (N9972), ♂ 19 April 1988, 2♂♂ 18 August 1997, on a slope above the north bank of the River Boyne, both CR; Gormanston Railway Station (O178674), north of, ♀ 20 July 1998, in a disused gravel pit just north of the station, CR. **LOUTH (H31):** Togher (O1189), ♂ ♀ 19 April 1988, ♀ 9 August 1998, in a disused gravel pit, north of the cross roads, both CR.

***Andrena clarkella* (Kirby, 1802)**

WEXFORD (H12): Killoughrim (S9041), ♀ 27 March 1989, JPOC. **WICKLOW (H20):** Knocksink (O2117), 2♂♂ 27 March 1987, JPOC; Knocksink Wood NNR (O215177), Enniskerry, ♀ 27 April 1988, nesting in a sandy riverbank by the car park, ♀ 11 April 1994, ♀ 6 April 1995 nesting, with others, in the ground beside a woodland path in oak woodland, all CR. **LOUTH (H31):** Togher (O117895), ♀ 19 April 1988, at a willow bush in a gravel pit.

***Andrena fucata* Smith, F., 1847**

CORK (west) (H03): Coolcolaughta (V940402), south of Durrus, 2♀♀ 1 August 2001, in a glassed-in porch of a house, CR. **WATERFORD (H06):** Passage East (S684115), 2km north-west, 2♂♂ 3 July 1983, JMOC. **WEXFORD (H12):** Killoughrim (S8941), ♂ 27 May 1987, JPOC. **OFFALY (H18):** Ballynalack (S195997), Glendine West, ♀ 16 June 2000, at a sandy stream bank in rough pasture, CR. **WICKLOW (H20):** Clara Vale oakwood (T184914), 2♀♀ 30 June 2001, at bramble at the edge of a track close to a disused gravel pit; Knocksink Wood NNR (O218176), entrance track, ♂ 21 April 1995, at the edge of a track, ♀ 24 June 1995, on dandelion at the edge of a track, 2♂♂ 14 June 1996, on hogweed *Heracleum* at the edge of a track, all CR. **DUBLIN (H21):** Skerries (O247597), 33 Dublin Road, ♂ 5 June 1994, in a back garden, CR. **MEATH (H22):** Herbertstown Bridge (O114637), 2♂♂ 1 May 1997, flying close to the parapet of an old stone bridge, CR. **WESTMEATH (H23):** Lough Analla (N569617), west of Delvin, ♂ 31 May 2000, at the edge of alder scrub bordering the lake, CR.

***Andrena haemorrhoa* (Fabricius, 1781)**

CLARE (H09): Lough Bunny (R3696), ♀ 28 May 1984, JMOC. **KILKENNY (H11):** Thomastown (S594402), south of, ♂♂ abundant and a few ♀♀ 3 May 2000, in open woodland beside the River Nore, CR. **WEXFORD (H12):** Stonyford (T107097), ♀ 13 June 1986, JPOC. **CARLOW (H13):** Cloughristick (S7069), ♂ 21 April 1987, JPOC. **OFFALY (H18):** Glyn (N093232), south of Ferbane, ♀ 16 June 2000, at yellow Compositae on the embankment of a disused railway, CR. **KILDARE (H19):** Carton (N9637), ♀ 29 April 1987, JPOC. **WICKLOW (H20):** Knocksink Wood NNR (O215177), ♀ 27 April 1988, nesting on a sandy river bank, ♂ 28 May 1993, both CR; Knocksink Wood NNR (O218176), ♀ 30 May 1994, in a clearing in an oak wood by the river, CR; Knocksink Wood NNR (O215177), ♂ 5 May 1995, CR. **DUBLIN (H21):** Howth (O2738), near Muck Rock, ♀ 2 July 1994, on marsh cinquefoil *Potentilla palustris*, CR; Skerries (O2459), ballast pit, ♀ 16 June 1996, CR; Skerries (O247597), 33 Dublin Road, ♀ 24 April 1993, ♀ 29 April 1994, ♀ 3 May 2001, in the back garden on Morello cherry blossom, all CR. **MEATH (H22):** Cromwell's Bush (O1064), ♂ 1 May 1997, at the edge of a marsh/fen, CR; near Newgrange (N9972), ♂ 19 April 1988, 2♀♀ 2 May 1997, on a slope above the River Boyne, both CR. **LOUTH (H31):** Baltray (O1577), ♂ 15 May 1997, at hawthorn blossom on the dunes, ♂ 18 May 1998, CR; Grangebellew

(O109860), ♀ 29 April 1987, on the slope of an Iron-age earthwork, CR; Stormanstown Bog (N913924), ♂♂ 10 May 2000, common flying around grey willow *Salix cinerea*, CR; Togher (O1189), ♂ 25 May 1997, at hawthorn blossom in gravel pit, CR.

***Andrena scotica* Perkins, R. C. L., 1919**

CLARE (H09): Ballyeighter (R346940), 2♀♀ 29 May 1984, JMOC; near Corker Pass (M308107), ♂ 23 May 1985, on a green road in the Burren, JMOC; Lough Bunny (R3696), 2♂♂ 28 May 1984, JMOC. **TIPPERARY (north) (H10):** near Ballina (R710725), ♂ 27 May 1984, ♂ ♀ 20 May 1985, in mixed woodland, JMOC, CR. **WICKLOW (H20):** Knocksink Wood NNR (O216179), Enniskerry, ♀ 28 May 1993, in a grassy clearing by river, CR. **DUBLIN (H21):** Ardgillen Park (O215609), 10 May 2001, small nesting aggregation in a clay bank with a hedge, no males seen, CR; Drumanagh (O270557), south of Loughshinny, ♀ 31 March 1997, on dandelion at the top of a boulder-clay cliff, CR; Skerries (O247597), 33 Dublin Road, ♀ 24 April 1993, ♀ 1 June 1998, in the back garden, ♀ 10 June 2001, on a bedroom window, all CR. **MEATH (H22):** Drumman House (O005689), ♂ 4 June 1997, at *Cotoneaster*, CR; near Newgrange (N995726), ♀ 2 May 1997, on a grassy slope on the northern bank of the River Boyne, CR; **LONGFORD (H24):** Lyneen Bridge (N098678), Royal Canal, ♀ 22 May 2001, (others flying in same area) emerging from the ground on the sloping bank of a derelict canal, CR. **LOUTH (H31):** Baltray (O1577), dunes, ♂ 18 May 1998, at hawthorn flowers, CR; Togher (O1189), ♂ 25 May 1997, at hawthorn blossom in a gravel pit, CR.

***Andrena subopaca* Nylander, 1848**

KERRY (north) (H02): Galway's Bridge (V914801), Killarney National Park, ♀ 7 July 2001, at yellow Compositae at the edge of a track above the bridge, CR. **CORK (west) (H03):** Glengarriff (V907575), ♀ 6 July 1985, in the oak wood, JMOC. **WEXFORD (H12):** Ferrycarrig (T005228), ♂ 2 June 1986, in a marsh with birch, JPOC; Oaklands (S715255), ♀ 29 May 1987, JPOC. **OFFALY (H18):** Clonmeen (N5329), south of Rhode, ♀♀ 4 August 1998, on bramble flowers on a grassy bank in a cutting of the light railway, CR. **KILDARE (H19):** Carton (N9637), ♂ 29 April 1987, JPOC. **WICKLOW (H20):** Clara Vale (T1891), oakwoods, ♀ 5 June 1998, on a sunny south facing bank above the main entrance track, CR; Clara Vale (T182916), oakwoods, ♀ 30 June 2001, at yellow Compositae at a track edge, CR;

Knocksink Wood NNR (O218176), ♀ 25 June 1993, nesting in the sandy ground in a clearing in an oak wood by the river, ♂ 18 May 1996, on dandelion near mature Scots pine *Pinus sylvestris* beside a track into the reserve, both CR; Priests Hall (O208112), ♀♀ 27 July 1998, on an embankment above the bed of the former reservoir, CR. **MEATH (H22):** Herbertstown Bridge (O114637), ♀ 5 July 1997, at ivy covered bridge in stream valley, CR.

***Andrena tarsata* Nylander, 1848**

LAOIS (H14): The Derry Hills (N2612), ♂ 28 June 2000, on yellow Compositae beside a drainage ditch, CR. **GALWAY (west) (H16):** Furnace Island (L8324), north of Lettermullan, ♂♂ ♀♀ 27 June 1997, on Compositae in a rocky pasture, ♂♂ 26 June 2001, flying backwards and forwards over a patch of marsh cinquefoil *Potentilla palustris* (no females seen), both CR; Gorumna Island (L865220), south of Ballynakill Lough, ♀ 17 July 2000, at yellow Compositae at a trackside, south of the lake, CR. **WICKLOW (H20):** near Calary Lower (O234119), ♂ 12 July 1983, JMOC. **MAYO (west) (H27):** Corryosla Bay (G197046), north-west of Pontoon, ♂ 21 July 2000, flying in an area of heather *Calluna vulgaris* growing on the open sandy lakeshore.

***Andrena wilkella* (Kirby, 1802)**

CLARE (H09): Ballyeighter (R346940), ♂ 29 May 1984, JMOC; Lough Bunny (R3696), ♀ 28 May 1984, JMOC. **TIPPERARY (north) (H10):** near Ballina (R710725), ♀ 20 May 1985, in mixed woodland, JMOC. **WEXFORD (H12):** Hook Head Lighthouse (X733973), ♂ 13 May 1998, flying low over cliff-top vegetation, CR. **WICKLOW (H20):** Clara Vale (T1891), oakwood, 2♂♂ 5 June 1998, at the edge of a track near the disused gravel pit, CR; Knocksink Wood NNR (O2117), ♀ 10 July 1995, on a sparsely vegetated slope at the rear of the reserve building, CR. **DUBLIN (H21):** Skerries (O247597), ♂ 24 May 2002, in a back garden on a French crane's-bill flower, CR. **WESTMEATH (H23):** Ardmorney (N3636), Long Hill esker at, ♂ 7 June 1999, flying along a hazel/hawthorn hedge, CR.

APIDAE: HALICTINAE

***Halictus rubicundus* (Christ, 1791)**

WATERFORD (H06): Dunmore East (S6800), ♂ 25 June 1984, JPOC. **KILKENNY (H11):** Ballylinch Bridge (S547436), ♂ 1 August 1994, beside the river bank, SW; Thomastown

(S594402), south of, ♀ 3 May 2000, on a dandelion in oak/conifer woodland, CR. **WEXFORD (H12):** Kiltealy (S838477), west of, ♀ 3 May 2000, at an entrance to a conifer plantation between Sculloge Gap and Kiltealy, CR; Tacumshin Lake (T063064), ♂ ♀ 28 August 1999, at a dry bank near the lake shore, CR. **GALWAY (west) (H16):** Furnace Island (L8324), north of Lettermullan, 3♂♂ 17 August 2000, CR. **WICKLOW (H20):** Clara Vale oakwood (T1891), ♂ ♀♀ 19 September 2001, females at the flowers of heather and a male at a yellow composite, CR; Clonmannon (T3097), south-east of, ♀ 8 April 1997, on a dandelion on a shingle ridge, CR; Devil's Glen Woods (T2498), ♂ 23 September 1997, at the edge of the main track, CR; Knocksink Wood NNR (O216179), Enniskerry, ♀ 20 May 1993, in a grassy clearing by the river, CR; Knocksink Wood NNR (O218176), Enniskerry, ♂ 10 September 1996, in a clearing in the oakwood by the river, CR. **DUBLIN (H21):** Ardla (O2360), Milverton, ♂ 20 August 1993, on an umbellifer on a former dump, CR; Barnageeragh (O230610), 2♀♀ 18 August 1986, nesting in the bare floor of an abandoned sand pit, CR; Drumanagh (O2755), Loughshinny, 2♀♀ 4 May 1996, on a dandelion on the cliff-top, ♂ 9 September 1997, on ragwort *Senecio* in a cliff-top field, both CR; Drumanagh (O273560), south-facing cliffs at, ♀♀ 5 June 2002, common at sea-milkwort *Glaux maritima* and thrift *Armeria maritima* on the slopes above the sea; Kenure Park (O2655), coast east of, ♂ 27 August 1993, in a field above the sea, CR; Rampart Bank (O2625), Dalkey, ♀ 26 April 1994, on a sheltered slope above the sea, SW; Skerries (O245601), ballast pit, ♂ 21 August 1993, in an old gravel pit beside the railway station, CR; same location (O246600), ♀ 16 June 1996, on a sandy slope in a disused gravel pit beside the railway station, CR; Skerries (O247597), 33 Dublin Road, ♀ 28 August 1999, at the flowers of *Rubus* in the garden, CR. **MEATH (H22):** near Gormanston (O175660), 2♀♀ 21 July 1986 and ♂ 14 August 1987, in an abandoned gravel pit on the road west of the N1, both CR; Gormanston Railway Station (O178674), north of, ♀ 25 May 1997, in an abandoned sand pit by the sea, CR; near Newgrange (N9972), ♀ 2 May 1997, on the north bank of the Boyne between Newgrange and Knowth, CR; Obelisk Bridge (O0475), west of, ♀ 7 August 1997, on the south bank of the River Boyne, CR; Visitor Centre (O027728), Boyne Valley National Park, ♀ 6 April 2000, at a south-facing embankment in the car-park, CR. **WESTMEATH (H23):** Long Hill esker (N3636), ♂ 15 August 1997, at the edge of a disused quarry near Ardmorney, CR. **LONGFORD (H24):** Lismagawley Bog (N025565), ♀♀

22 May 2001, nesting in the cracked dry peat at the top edge of the vertical face of an old peat cutting (a very unusual nesting site for this species), CR. **LOUTH (H31):** Stormanstown Bog (N913924), ♂♂ ♀♀ 23 August 2001, females at heather and a few males at *Rubus* flowers, CR; Togher (O1189), ♀ 19 April 1988, in an abandoned gravel pit, ♀♀ 25 May 1997, abundant, nesting in the sandy slopes and the vertical faces of an abandoned gravel pit, both CR.

***Lasioglossum albipes* (Fabricius, 1781)**

CLARE (H09): Ballyeighter (R346940), ♀ 29 May 1984, JMOC. **WEXFORD (H12):** Chour (T0904), Lady's Island Lake, ♀ 11 May 1998, CR. **LAOIS (H14):** Derry Hills (N2612), 2♂♂ 9 September, CR; The Derries (N583051), ♀ 11 June 1983, JMOC. **GALWAY (west) (H16):** Ballynakill Lake (L865220), Gorumna Island, 3♀♀ 17 July 2000, CR; Derryclare Wood (L8350, Gleninagh, ♀ 23 June 1997, on yellow Compositae at the edge of a track near an oakwood, CR; Furnace (Foirnis) (L8324), Lettermullan, ♀ 16 May 1986, ♂ 18 August 2000, both CR. **OFFALY (H18):** Clonmeen (N5329), south of Rhode, ♀ 4 August 1998, CR; Glyn (N093232), south of Ferbane, ♀ 16 June 2000, on the bank of the dismantled railway, CR. **KILDARE (H19):** Louisa Bridge (N990365), 2♂♂ 22 August 1982, swept in the marsh, JMOC. **WICKLOW (H20):** Clara Vale NNR (T1791), ♀ 30 May 1997, CR; Deputy's Pass (T2390), ♂ 18 August 1998, CR; Kilmacanoge (O2514), 4♂♂ 15 August 1982, swept in the alder marsh by the stream, JMOC; Knocksink Wood NNR (O2117), ♂ 28 July 1995, CR. **DUBLIN (H21):** Skerries (O2360), Milverton, ♂ 20 August 1993, CR; Skerries (O247597), 33 Dublin Road, ♂ 9 August 2000, CR. **MEATH (H22):** Gormanston (O177674), near the railway station, ♂ 9 September 1999, CR. **WESTMEATH (H23):** Lough Bane (N416775), Carlanstown, ♀ 27 June 2000, CR. **LOUTH (H31):** Mellifont Monastery (N0183), Collon, ♂ 9 August 1998, CR.

***Lasioglossum calceatum* (Scopoli, 1763)**

KILKENNY (H11): Thomastown (S594402), south of, ♀ 3 May 2000, on a dandelion in the open oak wood, CR. **WEXFORD (H12):** Chour/Lady's Island (T0904), ♀ 11 May 1998, at a dandelion, CR. **KILDARE (H19):** Castletown (N975345), ♂ 8 August 1982, in a mixed wood, JMOC. **WICKLOW (H20):** Clara Vale oakwood (T1791), ♀ 30 May 1997, CR; Clara Vale oakwood (T185915), ♂ 19 September 2001, at sheep's bit scaboius *Jasione montana*, CR;

Deputy's Pass (T2390), 2♂♂ 18 August 1998, CR; Knocksink Wood NNR (O2117), ♀ 31 May 1994, CR. **DUBLIN (H21):** Drumanagh (O2755), south of Loughshinny, ♀ 8 April 1998, on a soft clay cliff, CR; Skerries (O247597), 33 Dublin Road, ♂ 14 August 1988, ♂ 9 August 2000, at a flower of a cultivated *Eryngium* flower, both CR; Skerries (O2360), Milverton, ♂ 20 August 1993, at yellow Compositae on the former dump, CR. **MEATH (H22):** Drumman House (O005689), west of Duleek, ♀ 7 July 1997, nesting in a clay exposure in pasture, CR; Gormanston (O175660), gravel pit, ♂ 14 August 1987, in a disused gravel pit, CR; Herbertstown Bridge (O114637), ♀ 5 July 1997, in the stream valley, CR; near Newgrange (N9972), ♀ 19 April 1988, nesting in a clay exposure on a grassy slope above the river, ♀ 2 May 1997, at the eroded bare soil on a slope above the river, both CR. **CAVAN (H30):** Cuilcagh Lough (N6389), ♂ 21 August 1982, JMOC. **LOUTH (H31):** Grangebellew (O109860), ♀ 29 April 1987, nesting in exposed soil in the banks of an Iron-age fort, CR.

***Lasioglossum leucopum* (Kirby, 1802)**

CORK (west) (H03): Garnish Island (V936560), Glengarriff, ♀ 1 July 1985, JMOC. **WATERFORD (H06):** Dunmore East (S6800), ♀ 1 July 1983, in the grounds of the Haven Hotel on *Pyracantha*, JPOC. **GALWAY (west) (H16):** Ballynakill Lake (L868220), Gorumna Island, ♀ 17 July 2000, at tormentil *Potentilla erecta* at the edge of a track, CR. **GALWAY (north east) (H17):** Mountsilk (M597500), north-west of, ♀ 29 July 2001, at a nest site in a sand/gravel pit, CR. **OFFALY (H18):** Clonmeen (N5329), south of Rhode, ♂ ♀ 4 August 1998, in the cutting of the light industrial railway, CR. **WICKLOW (H20):** Clara Vale NNR (T1791), 2♀♀ 5 June 1998, 3♀♀ 30 June 2001 (at tormentil at edge of track), ♂ 19 September 2001 on devil's-bit scabious at the edge of an old gravel pit in the oakwood, all CR; Devil's Glen Wood (T2498), ♀ 30 May 1997, ♀ 23 September 1997, ♀ 4 June 1998, at the edge of the main track, all CR; Knocksink Wood NNR (O218179), ♀ 3 May 1995, ♀ 10 July 1995, on a bare slope at the back of the reserve building, ♀ 10 September 1996, on the vegetation at the edge of the main track into the reserve, all CR. **DUBLIN (H21):** Skerries (O2360), Milverton, ♂ 20 August 1993, CR; The Island (O235475), Malahide, ♀ 25 July 1995 at wild carrot, CR. **LOUTH (H31):** Giles Quay (J1605), east of, ♀ 11 August 1998, in a gravel pit near the mouth of the Castletown River, CR; Togher (O1189), 2♂♂ 9 August 1998, in a gravel pit, CR.

***Lasioglossum punctatissimum* (Schenck, 1853)**

WEXFORD (H12): Raven NNR (T1123), ♀ 1 July 1999, CR. **CARLOW (H13):** Ballykeenan woods (S725448), ♀ 23 April 2002, in an area cleared of conifers, on a slope above the River Barrow, CR. **WICKLOW (H20):** Clonmannon (T3097), south-east of, 2♀♀ 8 April 1997, at yellow Compositae on a shingle ridge, CR; Glen of the Downs (O2611), ♀ 27 April 1986, JMOC. **ROSCOMMON (H25):** Duggarry Bog (M9636), ♂ 17 July 1997, at the edge of a deep drainage ditch through boulder clay, beside a cut-over bog, CR.

***Lasioglossum villosulum* (Kirby, 1802)**

WATERFORD (H06): Dunmore East (S6800), ♀ 1 July 1983, on *Pyracantha* in the grounds of the Haven Hotel, JPOC; Lisselty (X6299), ♂ 29 August 1998, on wild carrot on a sandy cliff, CR. **WEXFORD (H12):** Ballyroe (T098327), south-east of, 2♂♂ ♀ 10 August 2000, in a field margin beside a pond, CR; Ballyvaloo (T105297), south-west of, 2♂♂ 10 August 2000, at a sandy bank in an area of gorse scrub south of a conifer plantation, CR; Chour (T0904), Lady's Island Lake, 2♀♀ 12 July 1999, on a sandy ridge behind a shingle ridge, ♀ 16 August 2001, on yellow Compositae beside the lakeshore, both CR; Churchtown (T063064), Tacumshin Lake, ♂ 15 August 2001, at a clay bank in a car-park, CR; Curracloe Beach (T114270), ♀ 14 July 1999, on the sand dunes north of the Raven NNR, CR; Grange strand (S8006), 2♀♀ 13 July 1999, nesting in the low clay cliffs at the top of the beach, CR; The Cull (S937068), Ballyteige, ♀ 11 July 1999, on marly spoil from a drainage channel in a re-claimed polder, CR; The Raven NNR (T1123), ♀ 31 July 1999, ♂ 28 August 1999, both CR. **CARLOW (H13):** near Ballon (S838680), ♀ 9 August 1986, on a sandy river bank, CR. **GALWAY (west) (H16):** Furnace (Foirnis) Island (L8324), north of Lettermullan, ♀ 10 August 1996, CR. **OFFALY (H18):** Bunakeeran wetlands (N215205), ♀ 24 June 2001, on a yellow composite growing on marly clay, CR. **WICKLOW (H20):** Clara Vale oakwoods (T185915), ♀ 19 September 2001, on sheep's-bit in an old sand/gravel pit, CR; Devil's Glen Wood (T2498), ♀ 30 May 1997, 2♂♂ ♀♀ 23 September 1997, both CR; Five-Mile Point (O3102), 2♀♀ 30 May 1997, ♀ 3 September 2000, both CR; Knocksink Wood NNR (O2117), ♂ 10 September 1996, track side vegetation, CR. **DUBLIN (H21):** Drumanagh (O2755), Loughshinny, ♂ 9 September 1997, on the cliff-top vegetation, CR; Skerries (O245601), ballast pit, ♂ 24 August 1986, ♂ ♀ 21 August 1993, both CR. **MEATH (H22):** Gormanston

(O177674), near the railway station, ♂ 10 September 1996, in a gravel pit north of the railway station, CR; near Newgrange (N9972), 2♂♂ 18 August 1997, on the north bank of the River Boyne, CR. **LOUTH (H31):** Giles Quay (J1605), east of, ♀ 11 August 1998, in a gravel quarry beside the Castletown River, CR.

APIDAE: MEGACHILINAE

***Osmia aurulenta* (Panzer, 1799)**

WATERFORD (H06): Lisselty (X6299), ♂ 1 May 2000, reared from a nest in a snail shell (*Cepea nemoralis* (L.)) taken on 15 July 1999, CR; same location, ♀ 3 May 2000, reared from a nest in a snail-shell taken at Lisselty on 15 July 1999, CR; same location, ♂ 2 May 2000, reared from a nest in a snail-shell taken on 15 July 1999, CR. **WEXFORD (H12):** Ballyteigue Burrows (S954046), ♂ 5 June 1986, swept in the sand dunes, JMOC; Chour (T0908), west of Carnsore Point, 11 May 1998 (2♀♀ sheltering in an empty snail shell on a shingle ridge, 2♂♂ on a dandelion, 1♂ flying over sparse vegetation on a shingle ridge between Lady's Island lake and the sea), all CR; Raven NNR (T1126), ♂♂ ♀♀ 14 May 1998, fairly common at wild pansy *Viola tricolor* and dandelion growing along a dune ridge between a conifer woodland and the sea on the eastern side of the reserve, CR. **WICKLOW (H20):** Five-Mile Point (O3102), ♂♂ ♀♀ 30 May 1997, visiting common bird's-foot-trefoil *Lotus corniculatus*, kidney vetch *Anthyllis vulneraria* and various yellow Compositae growing beside the railway on a shingle ridge south of the old Newcastle station, CR. **DUBLIN (H21):** Malahide (O2347), The Island, ♀ 14 May 1994, observed in flight also two dead mouldy pre-pupae in cells in a snail (*Cepea* sp.) shell and three empty cocoons in another snail (*Cepea* sp.) shell, CR. **LOUTH (H31):** Baltray (O1577), dunes, ♀ 15 May 1997, hovering above the ground at the base of an isolated hawthorn bush on disturbed sandy ground near the mouth of the River Boyne, ♀ 2 August 1997, a very worn specimen on bare sand in an area of exposed sand and cobbles beside the track, both CR.

APIDAE: NOMADINAE

***Nomada flavoguttata* (Kirby, 1802)**

CORK (west) (H03): Glengarriff Forest (V915570), 2♀♀ 4 July 1985, JMOC. **CLARE (H09):**

Ballyeighter (R346940), ♂ ♀ 29 May 1984, JMOC; near Formoyle (M1606), ♀ 29 May 1992, JPOC. **WEXFORD (H12):** Ballyvaloo (T105297), south-west of, ♂ 10 August 2000, at a low sandy bank in an area of gorse scrub, CR; Oaklands (S715255), ♂ 7 June 1986, swept in mixed woodland, JMOC. **GALWAY (west) (H16):** Furnace Island (L8324), north of Lettermullan, ♀ 17 August 2000, flying low on a sheltered slope in pasture, CR. **OFFALY (H18):** Ballynalack (S195997), Glendine West, ♀ 16 June 2000, flying along a stream bank in rough pasture, CR. **WICKLOW (H20):** Clara Vale (T1791), oakwood, ♂ ♀ 30 May 1997, at a trackside south-facing bank in open woodland, CR; Knocksink Wood NNR (O216179), Enniskerry, ♀ 21 May 1993, in a grassy clearing by the river, CR. **DUBLIN (H21):** Skerries (O2459), near the railway station, ♀ 17 July 1994, on a west facing embankment, west of the station, CR. **MEATH (H22):** near Newgrange (N9972), ♂ ♀ 2 May 1997, on a slope on the north bank of the River Boyne, CR.

***Nomada marshamella* (Kirby, 1802)**

CLARE (H09): Lough Bunny (R3696), 2♂♂ 28 May 1984, JMOC. **KILKENNY (H11):** Thomastown (S594402), south of, 3♂♂ 3 May 2000, in open oak and conifer woodland on the west bank of the River Nore, CR. **WEXFORD (H12):** Oaklands (S715255), ♀ 7 June 1986, swept in mixed woodland, JMOC; Stonyford (T107097), ♂ 13 June 1986, JPOC; Tintern Abbey (S7909), north of Saltmills, ♀♀ 12 May 1998, at the edge of deciduous woodland, CR. **CARLOW (H13):** John's Hill (S8655), west of Bunclody, ♀ 22 May 1987, flying low in the woodland edge, CR. **KILDARE (H19):** Kingsbog (N7108), south of Kildare, ♂ 16 June 1998, in a clearing in a conifer plantation, CR. **WICKLOW (H20):** Knocksink Wood NNR (O216179), Enniskerry, ♀ 20 May 1993, in a grassy clearing by the river, CR; Powerscourt (O2012), ♂ 15 June 1988, JPOC; Woodenbridge (T175781), west of, ♂ ♀ 3 May 2000, flying at willow catkins in woodland by the Aughrim River, CR. **DUBLIN (H21):** Drumanagh (O2755), south of Loughshinny, ♂ 17 April 1997, on the cliff-top vegetation, CR. **MEATH (H22):** near Newgrange (N9972), ♀ 2 May 1997, on a slope above the north bank of the River Boyne, CR. **WESTMEATH (H23):** Ardmorney (N3636), Long Hill esker, 2♂♂ ♀ 7 June 1999, on a grassy slope where the road cuts through an esker ridge, CR. **LONGFORD (H24):** Lyneen Bridge (N098678), Royal Canal, ♂ ♀ 22 May 2001, on a sloping bank of the derelict canal, CR. **LOUTH (H31):** Baltray (O1577), dunes, ♀ 18 May 1998, emerging from a rabbit

burrow, CR; Ferrard Cross (O1389), marl pit, 2♀♀ 25 May 1997, at dandelion on the floor of the pit, CR.

***Nomada obtusifrons* Nylander, 1848**

GALWAY (west) (H16): Clifden Castle (L6351), ♀ 24 July 1982, swept in a mixed wood, JPOC; Furnace Island (L8324), north of Lettermullan, ♂♂ ♀♀ 3 July 1998, flying low on a sheltered slope in pasture, ♂ 26 June 2001, close to the nest entrance of an unknown bee (? waiting for emergence of female), both CR.

***Nomada panzeri* Lepeletier, 1841**

WATERFORD (H06): Passage East (S684115), 2km north-west of, ♂ 3 July 1983, JMOC. **KILKENNY (H11):** Thomastown (S594402), south of, ♂ 3 May 2000, in open oak and conifer woodland on the west bank of the River Nore, CR. **WEXFORD (H12):** Oaklands (S718259), 2♀♀ 18 June 1982, swept in mixed woodland, JMOC; Sculloge Gap (S838478), east of, 2♀♀ 3 May 2000, on a sandy bank containing an aggregation of *Andrena cineraria* (L.) at an entrance to a conifer plantation, CR. **LAOIS (H14):** Inchanisky (N303012), Delour River, 2♀♀ 16 June 2000, flying along a stoney river bank, CR. **WICKLOW (H20):** Clara Vale oakwood (T1891), 2♀♀ 5 June 1998, at the south-facing bank in open woodland, CR; Clara Vale oakwood (T184914), ♀ 30 June 2001, at a trackside, CR; Knocksink Wood NNR (O218176), Enniskerry, 2♀♀ 30 May 1994, in a clearing by the river in the oak wood, CR.

***Nomada ruficornis* (Linnaeus, 1758)**

KILKENNY (H11): Thomastown (S594402), south of, 2♂♂ 3 May 2000, in open oak and conifer woodland on the west bank of the River Nore, CR. **WEXFORD (H12):** Tintern Abbey (S7909), north of Saltmills, ♀ 12 May 1998, at the edge of deciduous woodland, CR. **CARLOW (H13):** Cloughristick (S7069), ♀ 19 June 1982, JMOC. **GALWAY (south-east) (H15):** Loughrea (M5518), west of, ♀ 20 May 1986, at a dandelion on the track side in a conifer plantation, CR. **WICKLOW (H20):** Knocksink Wood NNR (O216179), Enniskerry, ♂ ♀ 21 May 1993, in a grassy clearing by the river, CR; Knocksink Wood NNR (O218176), Enniskerry, ♀ 25 June 1993, in a clearing in an oak wood by the river, ♂ 18 May 1996, at the edge of a track by large Scots pines, both CR; Mount Usher (T2796), Ashford, ♀ 27 May 1991, JMOC; Woodenbridge (T175781), west of, ♂ 3 May 2000, flying at *Salix* catkins in woodland by the Aughrim River, CR. **MEATH (H22):** near Newgrange (N9972), 2♂♂ 2 May

1997, on a slope above the north bank of the River Boyne, CR.

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A REASSESSMENT OF CHIRONOMIDAE (DIPTERA) OF CLARE ISLAND, CO. MAYO, WITH FIRST RECORDS OF *ACAMPTOCLADIUS REISSI* CRANSTON AND SÆTHER AND *LIMNOPHYES ANGELICAE* SÆTHER (ORTHOCLADIINAE) FOR THE IRISH FAUNAL CHECKLIST

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Abstract

This paper considers the status of previous records of Chironomidae from Clare Island, Co. Mayo and provides a list of 103 taxa recorded in 2000 and 2002 from collections at 33 sites on the Island. A total of ninety five species are new records for Clare Island and two, *Acamptocladius reissi* Cranston and Sæther and *Limnophyes angelicae* Sæther, not yet found on the Irish mainland, are new additions to the Irish chironomid checklist.

Introduction

Clare Island, situated 5km west of the County Mayo coastline at the south entrance of Clew Bay, has a land surface area of approximately 16km^2. The island extends 7.5km along its east/west axis and reaches 4.0km at its broadest on its north-south axis. The island was subjected to glacial activity and separated from the mainland following the last glaciation. A multidisciplinary survey of the natural history, geology, folklore and archaeology of Clare Island was carried out between 1909 and 1911 under the auspices of the Royal Irish Academy. That study included contributions on the insect fauna from C. Morley (Hymenoptera), J. N. Halbert (Hemiptera), F. Balfour-Brown (aquatic Coleoptera), Rev. W. F. Johnson and P. H. Grimshaw (Diptera) - all eminent entomologists of the period. Grimshaw (1912) provided a list of 519 species of Diptera based on his examination of over 4,000 specimens from Clare Island and from adjoining mainland sites in County Mayo, some of which he himself had collected and others which he obtained from Halbert, Morley and Johnson. However, of the 39 species of "Tendipedidae" (Chironomidae) reported by Grimshaw (1912) only eight species, determined

from a small number of specimens collected by Halbert and Grimshaw, were taken on Clare Island; the remaining 31 were recorded on the mainland only. Grimshaw (1912) remarked "regarding the Dipterous fauna of Clare Island itself, as compared with the mainland, little is of note".

The modern approach to chironomid classification is firmly based on consideration of all life history stages, in contrast to the time of the Clare Island Survey when it was based on the adult stage alone. Thus, current procedures for chironomid species recognition rely on meticulous slide preparation for detailed critical microscopic examination of adult morphological features and external genitalia - supplemented by examination of reared material or collections of pupal exuviae. The wealth of taxonomic features of the immature aquatic stages of Chironomidae, and their immense value in taxonomic and ecological studies and in biodiversity assessment, was not available to biologists at the time of the original Clare Island Survey. In the latter half of the 20th century the exceptional value of collecting and examining the cast pupal exuviae of pharate adult chironomids contributed significantly to advances, not only in taxonomy but also to studies in phenology and diversity assessment.

In 1991 the Royal Irish Academy initiated a "New Survey of Clare Island" and, as part of this survey a qualitative study has been undertaken on the chironomid fauna of the island. This paper provides a preliminary report based on collections of adult and immature Chironomidae from three visits to the island - once in the year 2000 and twice during 2002.

Materials and methods

Fifty-nine collections were made at 33 sites during fieldwork on Clare Island in April 2000 and June and August 2002 (Table 1, Figure 1). Nineteen collections were made between 27 and 29 April 2000, seventeen between 4 and 5 June 2002 and twenty-three between 21 and 23 August 2002. Adult Chironomidae were obtained by aerial sweep netting. Pupal exuviae were collected by skimming surface waters of appropriate water bodies with fine mesh nets and by use of drift nets placed overnight in some flowing water habitats. Some larvae were obtained by use of pond nets and a selection of mature, pre-pupal stage larvae was retained alive for rearing while remaining larvae were preserved in 70% alcohol as were all adult specimens and pupal exuviae. Adults, pupal exuviae and larvae were dissected and slide mounted according to

methods outlined in Wiederholm (1983, 1986, 1989). Identifications were based on key works in Pinder (1978), Langton (1991), Wiederholm (loc. cit.) and relevant recent taxonomic revisions of individual genera, including those of Hirvenoja (1973), Sæther (1989, 1990, 1995), Strenzke (1959), Sæther *et al.* (2000), Sæther and Sublette (1983), Sæther and Wang (1995) and by use of extensive reference material in the personal collection of the senior author. On completion of this study, representative voucher slide material will be deposited in the National Museum of Ireland, Dublin.

Results

A total of 103 taxa, 97 positively identified to species-level, within six of the 11 recognised subfamilies of Chironomidae, has been identified in the collections examined (Table 2). The majority belongs to the Orthocladiinae (58 taxa) followed by the Chironominae (32 taxa) and Tanypodinae (10 taxa) with one species from each of the subfamilies Diamesinae, Prodiamesinae and Telmatogetoniinae. Of the eight species collected during the original survey (Table 3) only two, *Psectrocladius sordidellus* Zetterstedt and *Micropsectra junci* (Meigen) (recorded by Grimshaw, as *Tanytarsus* sp. *gmundensis* Egger), were present in the collections obtained in this study. Thus 101 taxa, 95 identified to species level, found in this present study, constitute new records for Clare Island. Among these records are two species new to the Irish fauna (detailed below) and several halophilous taxa, including *Thalassomya frauenfeldi* Schiner (Subfamily Telmatogetoniinae). This latter record constitutes only the third location for the species from the west coast of Ireland as are the previous two records (Murray, 2000).

Status of original Clare Island Survey records

Some uncertainty exists about the exact identity of several species noted by Grimshaw (1912) but not found in the 2000-2002 collections, which is deserving of further comment.

***Macropelopia nebulosa* (Meigen)** {as *Ablabesmyia nebulosa* Mg in Grimshaw}

While two species of *Macropelopia*, *M. adaucta* Kieffer and *M. notata* (Meigen), were recorded in the present survey, Grimshaw (1912) provided a record of two males and one female of *M. nebulosa* under its synonym "*Ablabesmyia nebulosa*" and commented on it as "a well marked species". However, although it is not impossible that *M. nebulosa* was present, it

is known that early records of *M. nebulosa* and *M. notata* have been frequently confused (Fittkau, 1962). Both species have wing markings and are superficially similar but may be differentiated on the basis of the presence of a gonocoxite lobe in *M. notata*, absent in *M. nebulosa*. This feature, clearly visible in slide preparations, may have been difficult to observe in pinned specimens. At the time of the original survey *M. adaucta* was not described but the adult male of this species is readily distinguished by the absence of wing markings. Separation of all three species is relatively easy on features of the pupal exuviae and the characteristic exuviae of *M. adaucta* and *M. notata* only were found in the present study.

***Potthasita gaedii* Meigen** {as *Diamesa ammon* Hal. in Grimshaw}

Diamesa ammon, described by Haliday (in Walker 1856) from type localities in Counties Down, Cork and Kerry, is now considered a synonym of *Potthastia gaedii* Meigen. Grimshaw's (1912) reference to the characteristic "heart-shaped fourth tarsal segment" applies to species within the genus *Potthastia* as well as to *Diamesa* species. However, it may also be significant that Grimshaw stated, of the single female specimen he examined, that "the wings are milky white -notwithstanding the fact that Haliday described them as hyaline in this sex ....." an observation suggesting that Grimshaw's specimen may not have been the *Diamesa ammon* described by Haliday. In the present study both male and female imagines (one each) of *Diamesa insignipes* Kieffer, which also have a characteristic cordiform tarsomere 4, were collected in the vicinity of the Bayview Hotel (Site 11) on 27 April 2000 but this species is quite distinct from *Potthastia gaedii*. However, although *P. gaedii* is widely distributed in Ireland and is found in a variety of flowing waters, at present the record of *P. gaedii* from Clare Island remains doubtful.

***?Odontomesa fulva* (Kieffer)** {as *Prodiamesa obscurimana* Mg. in Grimshaw}

Grimshaw (1912) identified three male specimens from Clare island as *Prodiamesa obscurimana*. The status of *P. obscurimana* is uncertain as it is currently considered a questionable synonym of *Odontomesa fulva* (Kieffer), a species originally described in the genus *Prodiamesa* but transferred to the genus *Odontomesa* on designation of generic status by Pagast (1947). *O. fulva* is thus far not recorded from the Irish mainland but is known from Great Britain. However, a possibility exists that Grimshaw may have mistakenly identified *P. obscurimana* for the rather common species *Prodiamesa olivacea* (Meigen) which was found

along the Doree River at Site 22 in the present study and which is a common species of slow flowing rivers and streams on the mainland where its larvae live in silt laden sediments.

***Cricotopus* (*Cricotopus*) *tibialis* (Meigen)** {as *Cricotopus tibialis* Mg. in Grimshaw}

Cricotopus tibialis is a common species on the Irish mainland but was not found during this study on Clare Island although five other species were positively identified from keys in Hirvenoja's (1973) comprehensive revision of the genus. It remains as a possible component of the Clare Island fauna.

***Chironomus dorsalis* (Meigen)** {as *Tendipes dorsalis* Mg. in Grimshaw}

Grimshaw (1912) refers to this taxon as "a variable but common species". He examined two male specimens and notes the presence of "light chestnut brown to black thoracic stripes" and "transversely banded abdomen". Confusion exists in the chironomid literature on the status of early determinations of *Chironomus dorsalis* and many citations of this taxon may not be reliable. However, in the present study adult male and pupal exuviae material of *C. dorsalis* as defined by Strenzke (1959) and Langton (1991) respectively has been obtained and it is likely that Grimshaw's record of *C. dorsalis* is valid.

***Chironomus* (*Camptochironomus*) *tentans* (Fabricius)** {as *Tendipes tentans* Fab. in Grimshaw}

Camptochironomus tentans is a large and readily recognisable species. Specimens believed to be *C. tentans* were observed in flight on 28 April 2000 but it proved impossible to capture them at the time. It is likely that Grimshaw's record is reliable.

Additions to the Irish faunal list

Two species, *Acamptocladius reissi* Cranston and Sæther and *Limnophyes angelicae* Sæther, collected on Clare Island in this study, have not yet been found on the Irish mainland and thus constitute new records for the zoogeographical region of Ireland.

***Acamptocladius reissi* Cranston and Sæther, 1982**

Pupal exuviae of *Acamptocladius reissi* were obtained on 5 June and again on 20 August 2002 at Site 7, a shallow, maximum 1.0m deep, 15m diameter pool with profuse growth of *Sphagnum* and a soft substrate. The type material of *A. reissi* originated from a turf-cutting in Murnaur Moos, Upper Bavaria (Cranston and Sæther, 1982). Langton (1991) indicates that "northern pools" offer a typical habitat for the species. The species is also known from Norway

(Schnell and Aagaard, 1996), Finland (Sæther, pers. com.), Britain (Chandler, 1998) and has been reported from a small lagoon at an altitude of 2,245m above sea level in the Pyrenees (Rieverdall and Pratt, 2000).

***Limnophyes angelicae* Sæther, 1990**

Adult males of *Limnophyes angelicae* were obtained over low ground-cover vegetation in an aerial sweep along the west, marshy, shore of Creggan Lough, Site 20, on 21 August 2002. This "quaking bog-like" collection site is soft underfoot and appears to be permanently wet. Larvae of the genus *Limnophyes*, generally considered to be eurytopic, occur in a variety of niches in aquatic, semi-terrestrial and some terrestrial habitats. Sæther (1990) drew attention to morphological similarities between *L. angelicae* and *L. cranstoni* Sæther and, while considering the possibility of conspecificity, separated the two species on the basis of higher leg ratios and lower number of lanceolate humeral setae in *L. angelicae*. The specimen from Creggan Lough agrees with Sæther's definition of *L. angelicae*. The species until now is only known from the type locality in Germany (Sæther, 1990) and from Britain (Chandler, 1998).

General comments

Inventories and checklists prepared for island faunas generally contain less species than similar landmass areas of adjoining mainland in the same geographical area. The record of only eight chironomid taxa on Clare Island in the original survey was disappointing, and from a biogeographic viewpoint was of little consequence as Grimshaw himself realised. However, at the time of the Clare island Survey when less than 50 species were known from the mainland of Ireland the record of eight taxa represented approximately 16% of the then known Irish fauna. At the present time, a total of 445 species is known from the Irish fauna (Ashe *et al.*, 1998; Langton, 2002) and the 103 species now known to occur amount to approximately 24% of the mainland fauna.

The collections undertaken in this study have yielded some 97 positively identified species with evidence for a possible six more in comparison to the eight only species reported by Grimshaw (1912). This result suggests not that immigration has occurred in the intervening years, but that information from the previous study suffered from a seemingly superficial collection effort, hindered by the limitations of early 20th century taxonomy. It is reasonable to

expect that additional taxa may be found on the island.

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FIGURE 1. Map of Clare Island with Irish National Grid overlay, showing locations (numbered 1 to 33 and cited for species records in Table 1) at which samples of Chironomidae were obtained in 2000 and 2002.

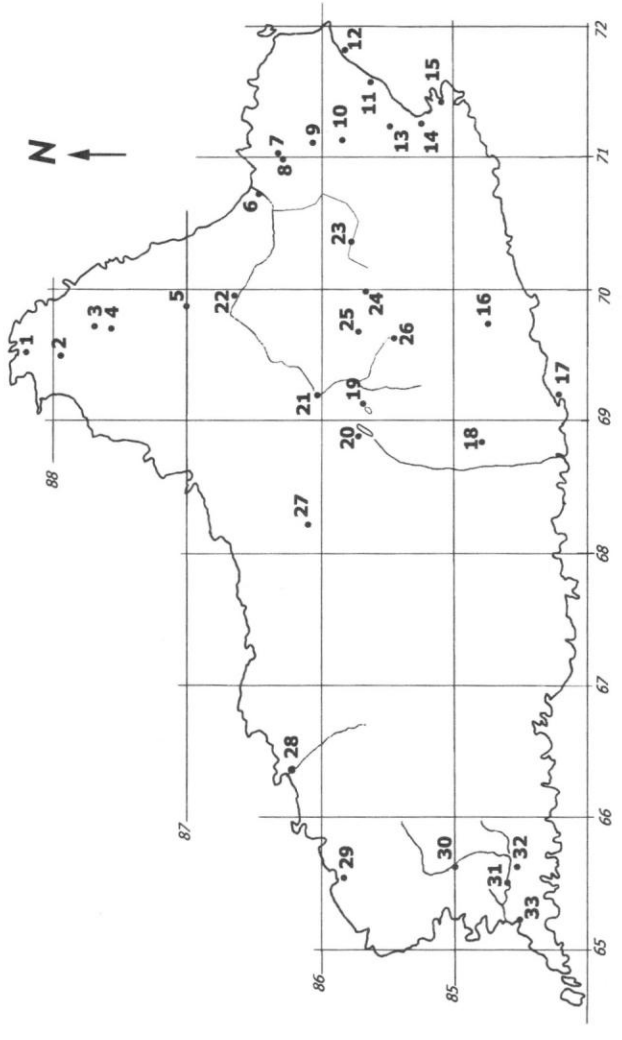

TABLE 1. Site number (see Fig. 1), Townland, Irish Grid Reference (IGR), Site location visit code (a, b, c) and dates when collections of Chironomidae were undertaken during visits to Clare Island in (a) April 2000, (b) June 2002 and (c) August 2002. Visit codes indicate sampling period for Location records cited in Table 2.

Site	Townland	IGR	Site Location	Visit	Date(s)
1	Ballytoohy	L696882	Wetland east of lighthouse	c	20-8-02
2	Ballytoohy	L695879	Seepage south of lighthouse	c	20-8-02
3	Ballytoohy	L698875	Lighthouse road, small tank	c	20-8-02
4	Ballytoohy	L699874	Lighthouse road streamlet	c	20-8-02
5	Ballytoohy	L699870	Roadside at "Ballytoohy Weavers"	c	20-8-02
6	Maum	L708865	River Doree, 100m from coast	a	28-4-00
7	Maum	L710863	Pond east of Fawnglass road	a, b, c	28-4-00, 5-6-02, 20-8-02
8	Maum	L709863	Bog pool west of Fawnglass road	a, b	28-4-00, 5-6-02
9	Maum	L711861	Streamlet west of Fawnglass road	a	28-4-00
10	Fawnglass	L712857	Along Fawnglass to Maum road	a, c	04-6-02, 20-8-02
11	Capnagower	L716856	Bayview Hotel road	a, b, c	27/28-4-00, 5-6-02, 21-8-02
12	Capnagower	L717857	Marine rock pools	a, b, c	28/29-4-00, 5-6-02, 20-8-02
13	Fawnglass	L713854	Stream opposite Community Centre	a, c	28-4-00, 21-8-02
14	Fawnglass	L713852	Glen River, at bridge 50m above sea	a, b	28-4-00, 5-6-02
15	Glen	L716851	Marine cove south of Granuaile's Castle	b	5-6-02
16	Kill	L698846	Portnakilly road	b	5-6-02
17	Strake	L692842	Portnakilly harbour	b	5-6-02
18	Strake	L689847	Roadside between Abbey-Knocknaveen	b	5-6-02
19	Lecarrow	L691856	Shoreline of Leinapollbauty Lough	b	5-6-02
20	Lecarrow	L689857	Shoreline of Creggan Lough	c	21-8-02
21	Lecarrow	L692860	Dorree River, beside acute bend in road	b	5-6-02
22	Ballytoohy Beg	L698867	Dorree River, 1km below Site 21	b	5-6-02
23	Lecarrow	L704858	Pollabrandy stream on Knocknaveen	b	4-6-02
24	Lecarrow	L705856	Small concrete tank south of Knocknaveen	b, c	4-6-02, 21-8-02
25	Lecarrow	L698858	Knocknaveen, along track	a, b, c	28-4-00, 4-6-02, 21-8-02
26	Lecarrow	L698855	Knocknaveen, seepage on north hillside	a	4-6-02
27	Scalpatruce	L683857	Bog pool east of Knockmore	c	21-8-02
28	Bunnamohaun	L664864	Stream from north side of Knockmore	c	21-8-02
29	Bunnamohaun	L658859	1.0m diameter pool, east of signal tower	c	21-8-02
30	Bunnamohaun	L657850	An Phuca Stream, S.E of Signal tower	c	21-8-02
31	Bunnamohaun	L658848	An Phuca 500m downstream of Site 30	c	21-8-02
32	Bunnamohaun	L659846	Humic Pond at west end	c	21-8-02
33	Bunnamohaun	L652849	Over rock pool at west end	c	21-8-02

TABLE 2. List of Chironomidae found during this study on Clare Island. Site ID number of record (see Figure 1 and Table 1) is followed by a letter code indicating sampling period: a - April 2000, b - June 2002, c - August 2002. See Table 1 for details of sampling date. *Denotes first record for Ireland; + denotes confirmation of previous record on Clare Island.

Subfamily Tanypodinae
Macropelopia adaucta Kieffer: 7a; 9a; 10c; 11a; 27c; 29c
Macropelopia notata (Meigen): 7c; 24c
Ablabesmyia monilis (L.): 7a, b, c; 19b; 20c
Arctopelopia griseipennis (van der Wulp): 8a; 19b; 20c
Krenopelopia nigropunctata (Staeger): 12c
Monopelopia tenuicalcar (Kieffer): 7b, c;
Nilotanypus dubius (Meigen): 31c
Paramerina pygmaea (van der Wulp): 7c; 19b; 20b
Procladius (*Holotanypus*) *choreus* (Meigen): 1c; 7b, c; 10c; 20c; 29c; 32c
Zavrelimyia barbatipes (Kieffer): 8b

Subfamily Diamesinae
Diamesa insignipes Kieffer: 11a

Subfamily Telmatogetoniinae
Thalassomya frauenfeldi Schiner: 12a

Subfamily Prodiamesinae
Prodiamesa olivacea (Meigen): 22b

Subfamily Orthocladiinae
**Acamptocladius reissi* Cranston and Sæther: 7b,c
Acricotopus lucens (Zetterstedt): 29c
Brillia bifida Kieffer: 13a, b; 14a; 25a
Camptocladius stercorarius (De Geer): 11a
Chaetocladius melaleucas (Meigen): 1c; 10b; 18b; 29c
Chaetocladius perennis (Meigen): 11a; 12c; 13a
Clunio marinus Haliday: 12a, b, c
Corynoneura edwarsdi Brundin: 29c
Corynoneura lobata Edwards: 25a
Corynoneurella paludosa Brundin: 31c
Cricotopus (*Cricotopus*) *albiforceps* (Kieffer): 20c
Cricotopus (*Cricotopus*) *pilosellus* Brundin: 20c
Cricotopus (*Cricotopus*) *ephippium* (Zetterstedt): 19b
Cricotopus (*Cricotopus*) *pulchripes* Verrall: 6a
Cricotopus (*Isocladius*) *ornatus* (Meigen): 19b

TABLE 2 (Continued)

Eukiefferiella claripennis (Lundbeck): 6a
Eukiefferiella cyanea Thienemann: 6a
Eukiefferiella devonica (Edwards): 6a
Eukiefferiella minor (Edwards): 6a
Eukiefferiella cf *similis*: 6a
Halocladius (*Halocaldius*) *fucicola* (Edwards): 15b; 17b
Halocladius (*Halocaldius*) *variabilis* (Staeger): 11a; 12a
Heterotanytarsus apicalis (Kieffer): 6a
Heterotrissocladius marcidus (Walker): 7a
**Limnophyes angelicae* Sæther: 20c
Limnophyes gurgicola (Edwards): 10c; 11a
Limnophyes minimus (Meigen): 11a; 12c
Limnophyes natalensis (Kieffer): 1c; 2c; 10b; 18b
Limnophyes pentaplastus (Kieffer): 10b; 22b
Metriocnemus eurynotus (Holmgren): 10b; 13b; 18b
Metriocnemus fuscipes (Meigen): 1c; 2c; 5c; 10c; 12c; 18b; 27c, 28c
Metriocnemus picipes (Edwards): 11a; 24c
Orthocladius (*Eudactylocladius*) *fuscimanus* (Kieffer): 11a
Orthocladius (*Orthocladius*) *oblidens* (Walker): 31c
Orthocladius (*Orthocladius*) pe 4 (Langton, 1991): 6a
Parametriocnemus stylatus (Kieffer): 26b; 31c
Paraphaenocladius impensus (Walker): 10a; 11a
Paraphaenocladius irritus (Walker): 12a
Paraphaenocladius pseudirritus Strenzke: 1c; 2c
Paratrichocladius rufiventris (Meigen): 6a
Psectrocladius (*Allopsectrocladius*) *obvius* (Walker): 1c; 7b; 20c
Psectrocladius (*Allopsectrocladius*) *platypus* (Edwards): 7b, c; 27c; 29c
Psectrocladius (*Psectrocladius*) *limbatellus* (Holmgren): 29c
Psectrocladius (*Psectrocladius*) *oligosetus* Wülker: 7c
+*Psectrocladius* (*Psectrocladius*) *sordidellus* (Zetterstedt): P; 13b
Psectrocladius (*Psectrocladius*) *ventricosus* Kieffer: 12c
Pseudorthocladius (*Pseudorthocladius*) *cranstoni* Sæther and Sublette: 11c; 28c
Pseudorthocladius (*Pseudorthocladius*) *filiformis* (Kieffer): 3c; 8a; 13b; 18c; 20c; 27c
Pseudosmittia recta (Edwards): 10c
Pseudosmittia trilobata (Edwards): 2c
Rheocricotopus (*Psilocricotopus*) *chalybeatus* (Edwards): 23b
Smittia pratorum (Goetghebuer): 11a; 22b; 31c
Synorthocladius semivirens (Kieffer): 11c; 23b; 30c
Thalassosmittia thalassophila (Goetghebuer): 11c; 12a, b, c; 15b; 17b
Thienemannia gracilis (Kieffer): 12a
Thienemanniella majuscula (Edwards): 7b; 25a; 31c
Thienemanniella pe2a sensu Langton: 26b

TABLE 2 (Continued)

Thienemanniella sp indet.: 21b, 23b

Subfamily Chironominae - Chironomini
Chironomus aprilinus Meigen: 11a
Chironomus cingulatus Meigen: 32c
Chironomus dorsalis -sensu Strenzke (in Langton, 1991): 7a
Chironomus pseudothummi Strenzke: 1c; 13b
Cladopelma krusemani (Goetgebuer): 19b; 20c
Glyptotendipes (*Phytotendipes*) *gripkoveni* (Kieffer): 19b
Glyptotendipes (*Phytotendipes*) *pallens* (Meigen): 20c
Glyptotendipes (*Phytotendipes*) *paripes* (Edwards): 9b; 32c
Lauterborniella agrayloides (Kieffer): 20c
Microtendipes chloris (Meigen): 20c; 32c
Parachironomus vitiosus Goetghebuer: 20c
Pagastiella orophila (Edwards): 19b
Phaenopsectra flavipes (Meigen): 20c
Polypedilum (*Pentapedilum*) *sordens* (van der Wulp): 19b; 20c
Polypedilum (*Pentapedilum*) *uncinatum* (Goetghebuer): 1c; 7c; 20c; 29c; 32c
Polypedilum (*Polypedilum*) pe 7 sensu Langton (1991): 20c
Polypedilum (*Polypedilum*) pe 8 sensu Langton (1991): 9b
Stempellinella brevis (Edwards): 21b; 23b

Subfamily Chironominae - Pseudochironomini
Pseudochironomus prasinatus (Staeger): 19b

Subfamily Chironominae - Tanytarsini
Micropsectra atrofasciata (Kieffer): 6a; 12c; 24c; 30c
Micropsectra bidentata (Goetghebuer): 14b
Micropsectra fusca (Meigen): 7a; 13a, b; 14a; 27c
+*Micropsectra junci* (Meigen) (as *Tanytarsus* sp. *gmundensis* Egger by Grimshaw): 4c; 10b, c
Micropsectra lindrothi (Goetghebuer): 29c; 32c
Paratanytarsus intricatus (Goetghebuer): 7c
Rheotanytarsus curtistylus (Goetghebuer): 10a; 25a; 30c; 31c
Tanytarsus buchonius Reiss et Fittkau: 10c; 13a; 29c
Tanytarsus gracilentus (Holmgren): 33c
Tanytarsus gregarius Kieffer: 19b; 20c
Tanytarsus signatus (van der Wulp): 9a; 10c; 12c; 13b
Tanytarsus sp. *lestagei*-aggregate: 7a
Zavrelia pentatoma (Kieffer): 20c

TABLE 3. Taxa and material (m, male; f, female) collected by J. N. Halbert (JNH) and P. H. Grimshaw (PHG) on Clare Island and reported by Grimshaw (1912), with current classification and indication of status of Grimshaw's record today.

Grimshaw designation	**Material**	**Collector**	**Current accepted classification**	**Status**
Ablabesmyia nebulosa Mg	2 m, 1f	JNH, PHG	*Macropelopia nebulosa* (Meigen)	Doubtful
Diamesa ammon Hal	1 f	JNH	*Potthastia gaedii* Meigen	Possible
Prodiamesa obscurimana Mg	3 m	JNH, PHG	*Odontomesa fulva* Kieffer (?)	Doubtful
Cricotopus tibialis Mg	3 m	JNH, PHG	*Cricotopus* (s. str.) *tibialis* (Meigen)	Possible
Orthocladius sordidellus Ztt	not detailed	PHG	*Psectrocladius* (s. str.) *sordidellus* Zetterstedt	Confirmed
Tendipes dorsalis Mg	2 m	JNH	*Chironomus dorsalis* (Meigen)	Likely
Tendipes tentans Fab	2 m, 2 f	JNH	*Camptochironomus tentans* (Fabricius)	Likely
Tanytarsus sp ? *gmundensis*	1 m, 1 f	PHG	*Micropsectra junci* (Meigen)	Confirmed

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A SURVEY OF MIGRANT BUTTERFLIES IN COUNTY DONEGAL, IRELAND

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Introduction

Each year, many butterfly species migrate in varying numbers over short distances. However, in the early summer, some species frequently migrate over thousands of kilometres. In Europe, this northwards migration usually results in three species reaching Ireland. These are the Clouded Yellow, Painted Lady and Red Admiral. Since the origin of these butterflies is North Africa and Southern Europe, Donegal, being the furthest county in Ireland from the source of supply, usually receives less than counties to the south and east. Occasionally, odd specimens of some other species may reach Donegal, such as the Camberwell Beauty and the Monarch. Besides the regular migrant butterflies, other species may extend their geographic range for a variety of reasons. For example, in recent decades, the Comma has been spreading northwards and westwards in Britain and colonizing extensive new areas there. Recently it has been reported from various parts of the east of Ireland. None the less, its reported sighting in Donegal in August 2001, near Lough Gartan, was sufficiently sensational to appear as an item in the national press (Irish Times of 15 September 2001, Michael Viney's column).

For Donegal, the position of the three regular migrants may be summarized as follows:

Clouded Yellow - rarely seen in Donegal except during the occasional major migrations to Britain and Ireland, such as in 1992 and 2000.

Painted Lady - most years a few occur here and there in Donegal, most often at the coast. Once or sometimes twice a decade larger numbers arrive and in favourable weather conditions breed successfully and the species becomes widespread and quite common in the county in late summer and early autumn.

Red Admiral - usually present at least in small numbers in coastal areas. In many years it is widespread and abundant throughout the county.

Period of survey and sources of records

The information in this report was obtained during the course of two recent butterfly surveys. The first survey was the 1995-1999 Butterfly Conservation (UK) Butterflies for the Millennium project, which was coordinated in the Republic of Ireland by the Dublin Naturalists' Field Club. Subsequently, surveying has been carried out from 2000 to 2002 and coordinated by Bob Aldwell in conjunction with surveys of resident species in Donegal supported by the Heritage Council, the Praeger Committee for Field Natural History of the Royal Irish Academy and the Dublin Naturalists' Field Club.

TABLE 1. Summary of results for Donegal migrant butterflies

Species	10km square Records 1995-1999	10km square Records 2000	10km square Records 2001	10km square Records 2002
Clouded Yellow	00	10	00	00
Painted Lady	10	35	11	10
Red Admiral	31	45	05	17

Summary outline of 2000-2002 butterfly migration in Donegal

A large-scale migration to Donegal of all three species took place in 2000. The records show the three species arriving in the county in mid-June. Four recorders listed the first sightings of the year in the county in the period 17-20 June. The Painted Lady and Red Admiral were reported from north and south Donegal at that time with just a single Clouded Yellow in south Donegal. Although 2000 was not especially sunny in the county, there was a good deal of warm cloudy weather. All three species bred successfully and many Painted Lady and Red Admiral larvae were to be found readily in late July through to mid-August. Widespread sightings of the next generation adults of all three species occurred in late August and

throughout September.

In Donegal in 2001, butterfly migration was characterized as coming late, the first sighting being in mid-July. The other feature was that there were slightly more reported sightings of the Painted Lady than the Red Admiral. This, however, was due to the scarcity of the Red Admiral rather than unusually large numbers of the Painted Lady.

2002, in contrast, produced early sightings in Donegal of the Painted Lady and Red Admiral followed by a significant gap from mid-June to late August. However, the Red Admiral in late summer was much more numerous than the Painted Lady, due probably to the proven ability of the Red Admiral to slow-down its larval stages in cool weather conditions. It was thus able to survive to benefit from the weather upturn in late August and September. The Painted Lady larvae are less able to cope in cool cloudy weather conditions, hence its relative lack of breeding success in Donegal in 2002.

Overview of the individual species

Clouded Yellow (*Colias croceus* (Geoffroy))

National and regional distribution in 10km squares: Republic of Ireland (DNFC survey) 80; Northern Ireland (1990-1999) 26; Donegal 10, all in 2000.

The Clouded Yellow in Donegal

The Clouded Yellow only rarely gets to Donegal during the occasional major invasions by the species of Britain and Ireland, such as 1992, when the species extends significantly further north than usual. The 2000 mid-June influx to Ireland was large-scale and the particular timing followed by some twelve weeks of relatively warm weather represented an unusually favourable combination of factors, which enabled successful breeding to take place at widely scattered locations in Donegal. Bird's-foot-trefoil (*Lotus* spp), which seems to be the most often used larval food plant for the Clouded Yellow in Ireland, is widespread in Donegal and abundant in many coastal districts.

The Clouded Yellow in Donegal 2000-2002

In 2000, only two sightings were reported of the initial influx in June. On 19 June at Rossnowlagh (G86) and on 29 June at Lough Eske (G98). On 19 July there was a record, again from Rossnowlagh. The first of what was probably the native born generation was seen on 13

August at Glencolumbkille (G58). Further August records were on 23 August at Dunfanaghy (C03) and also on the same date from Tory Island (B84). On 29 August a single specimen was seen at Four Masters Bridge (G85) and seven were seen on 31 August at Cruit Island (B72) in rather poor weather conditions. On 1 September, several were seen at Fintra dunes (G67) and also near Muckros (G67). On 5 September, another sighting was reported from Tory Island. Late in the month, on 25 September, a sighting was made near Letterkenny (C11) and on 30 September the last record came from Murvagh (G87).

No sightings were reported of the Clouded Yellow in Donegal in 2001 or 2002.

Discussion

Based on the records, the distribution of the Clouded Yellow in Donegal in 2000 appears to have been widespread but intermittent with considerable bias towards the coast. There is no doubt that the records are far from giving the full picture of the Clouded Yellow in Donegal in 2000. However, the presence of four recorders resident in east Donegal and two others intermittently in the north and east of the county strongly suggest that a butterfly as conspicuous and mobile as the Clouded Yellow should have been noticed had it been present in east Donegal and Inishowen in any significant numbers.

Painted Lady (*Cynthia cardui* (L.))

National and regional distribution in 10km squares: Republic of Ireland (DNFC survey) 222; Northern Ireland (1990-1999) 122; Donegal 43, 27 new 10km squares in 2000, 5 new 10km square records in 2001.

The Painted Lady in Donegal

Most years, a few Painted Lady adults and larvae are to be found in Donegal in coastal localities and in major river valleys, such as the Foyle. Once or perhaps twice a decade, a major influx takes place and the butterfly and its larvae are to be found in most parts of the county and in a wide range of habitats, including inland mountainous areas.

The Painted Lady in Donegal from 2000-2002

The first reported sighting in 2000 was on 17 June at Creevy (G86) on the south side of Donegal Bay. On 18 June a specimen was seen at Buncrana (C33) in Inishowen. Seven other Donegal June records of the Painted Lady extended from Dunmuckrum (G85) in the far south

to sightings in five different localities in western Inishowen (C32, C34 and C44). Larvae were widespread and sometimes plentiful in a variety of habitats from mid-July through to mid-August. The adult butterfly was again widespread and plentiful in many areas in late August and throughout September. The last reported sighting in Donegal for 2000 was on 30 September at Lifford (H39).

The first reported sighting in 2001 was from Ballymacaward (G86) on 31 July. August records were widespread, including three from Inishowen and two from the northwest of the county. Four records came from southwest Donegal and two from inland sites in the southeast in late August. Larvae were found in September on the St John's Point Peninsula (G77) and on the North side of Donegal Bay (G67).

The first 2002 Donegal sighting of the Painted Lady was at Letterkenny Golf Club (C21) at the unusually early date of 24 March. Another early record was at Grainan (C31) on 10 April. The next sighting was at Lifford on 22 May, while single specimens were seen at two localities in the Rosses (B71 and B82) on 6 June and also on the same date at Naran (G79), feeding on Escalonia at 7.45 in the morning. A single specimen was seen at Lenan (24) on 9 June. Only a single recording of larvae was at Inver dunes on 30 July, where five almost fully-grown caterpillars were seen. August yielded only three reports of adults, a single specimen near Letterkenny on 2 August, at Lough Gartan later in the month and two at Mountcharles on 24 August. Mid-September saw up to eight adults in the gardens at Salthill House, Mountcharles and single specimens near Letterkenny and at Lifford. Overall numbers of sightings of the Painted Lady in Donegal for 2002 were about average for the species.

Discussion

The year 2000, with records from thirty-five 10km squares in Donegal, represented one of the occasional major occurrences of the Painted lady in Donegal. As in the case of the Clouded Yellow, the warm weather after the initial influx in June, allowed successful breeding to take place and hence the widespread autumn records.

2001 was a fairly typical year in terms of numbers of sightings for the Painted Lady in Donegal. The late arrival of immigrants however, meant there was little time for a successful second generation to appear.

2002 had as its main features the very early sightings and, unusually, that the numbers of

sightings in the spring/early summer outnumbered those reported in August/September. This was very much weather controlled and, as a consequence of the poor weather in June and July, only limited successful breeding by the early immigrants could take place and thus enable their progeny to take advantage of the fine weather in September.

Red Admiral (*Vanessa atalanta* (L.))

National and regional distribution in 10km squares: Republic of Ireland (DNFC survey) 399; Northern Ireland (1990-1999) 141; Donegal 62, with 29 new squares in 2000 and 2 new squares in 2002.

The Red Admiral in Donegal

The Red Admiral occurs most years in Donegal. It was rather scarce in 1998 and more widespread in 1999, especially in the west of the county. It is present in a wide range of habitats, coastal and inland. Although sightings from late in October are known there is no clear evidence as yet that the species is able to over-winter in Donegal.

The Red Admiral in Donegal from 2000 to 2002

The first sighting in 2000 was on 17 June at Ballybofey, followed on 18 June by records from Buncrana (C33) and Glendowan (C01). On 19 June, there were sightings at Glenveagh (C02) and Inishowen (C32 and C34). The first sighting in south Donegal was on 2 July at Spierstown (G98). Larvae were present widely in late July, especially in the south of the county. Adults were widespread and numerous in late August and throughout September. The last 2000 record was on 19 October at Lifford (H39).

The first sighting in 2001 was reported on 19 July from Murvagh (G87). The only other sightings of adult Red Admirals in 2001 reported from Donegal were from Lifford (H39) in August and September. A late sighting was made at Lifford on 24 October and an isolated specimen was seen near Lough Derg (H07) also on 24 October. Larvae were found at three sites in south Donegal (G67 and G96) in mid-September.

The first sighting in 2002 was on 6 May at Lifford. Other May sightings came from near Letterkenny (C21) and at Crolly (B81). Two specimens were seen on 6 June at 7.30 a.m. at Portnoo (G79) and a single adult at Mullaghderg (B72) in the Rosses on 21 June. The species was quite widespread in the county from mid-August and throughout September. Thirty-six

were recorded on 20 September in an hour in the gardens at Salthill House, near Mountcharles (G87). The latest sighting was at Lifford on 13 October.

Discussion

The Red Admiral is usually the most common migrant butterfly in Donegal. Its ability to breed on even isolated nettles (*Urtica*) gives it an advantage over the Peacock and Small Tortoiseshell, which require nettle clumps. In 2001, the species had one of its lowest showings in Donegal in recent years. 2002 was about average in number of sightings.

Conclusions

Although Donegal is geographically the county in Ireland furthest from the sources of origin of these three migrant butterflies in North Africa and Southern Europe, all of them make it to the county in varying numbers. The Red Admiral is the only one that is present widely on a fairly regular basis. There is no evidence of any real change in the frequency of appearance of these three species in Donegal in recent decades.

Comma (*Polygonia c-album* (L.))

Michael Viney in the Irish Times of 15 September 2001 included a letter from Robert Pocock from Dún Laoghaire of a sighting of four Commas in company with Painted Ladies and Small Tortoiseshells on a *Buddleia* in his garden near Church Hill in August. I contacted him on 16 September and visited him a few days later. Ian Rippey also had a detailed correspondence with Mr Pocock and supplied me with a copy. The following summarises the information obtained:
Date of sighting: Friday 17 August at 4-5 on a sunny afternoon.
Location: On a white *Buddleia* in the garden at Tirargus, which is located about 150 metres from Lough Gartan. The Irish Grid Reference is approximately C064175.

The Commas appeared in fresh condition and remained in view for about one hour on the *Buddleia*, at a height of about two metres from the ground. Mr Pocock noted them as quite distinctly different from the accompanying Small Tortoiseshells and identified them on the basis of checking them with a UK coloured butterfly chart.

During a talk on moths and butterflies given by Ralph Sheppard on 22 January 2003, at the Donegal County Museum in Letterkenny, a member of the audience said that she had seen a

Comma not far from the Swilly, a little to the north of Letterkenny. She gave a good description of the butterfly, including the ragged wings and even the comma mark on its outer wings. Attempts are underway to try and obtain more details. The site is about 15km from Lough Gartan.

Discussion

As already mentioned, the Comma has been rapidly spreading northwards in recent decades in Britain as far north as southern Scotland. Previous sightings from Ireland in the last few years have been from Down and Wexford. At the same time, the Comma is easy to rear on nettles and the specimens seen could have been released or escaped from someone breeding them. The possibility of mistaken identity seems on all the evidence available to be unlikely. It will be necessary to carefully check for the Comma in Northwest Donegal in the coming few years. The Comma hibernates as an adult, so would appear in April and early May much the same as the Small Tortoiseshell and again in July and August before hibernation. So please check "Small Tortoiseshells" carefully in future as they just might turn out to be a Comma!

Acknowledgements

The surveying of migrant butterflies is particularly reliant on the team of observers who note and report the sightings. I wish especially to acknowledge the contributors to the 2000, 2001 and 2002 surveys of Donegal Migrant Butterflies, who provided records and helped to record the contrast between a bumper year in 2000 for migrant butterflies in Donegal and the following lean years. They are as follows: Craig Ayres, Anne Barton, Ken Bond, John Cromie, Nick Duff, Emer Magee, Eamonn McGlinchey, Pat Murphy, Robert Pocock, Ralph and Liz Sheppard, Sue Shiels, Alison and Maurice Simms, Frank Smyth and Elizabeth Temple.

FIGURE 1. Donegal butterflies: Clouded Yellow (CY) 2000.

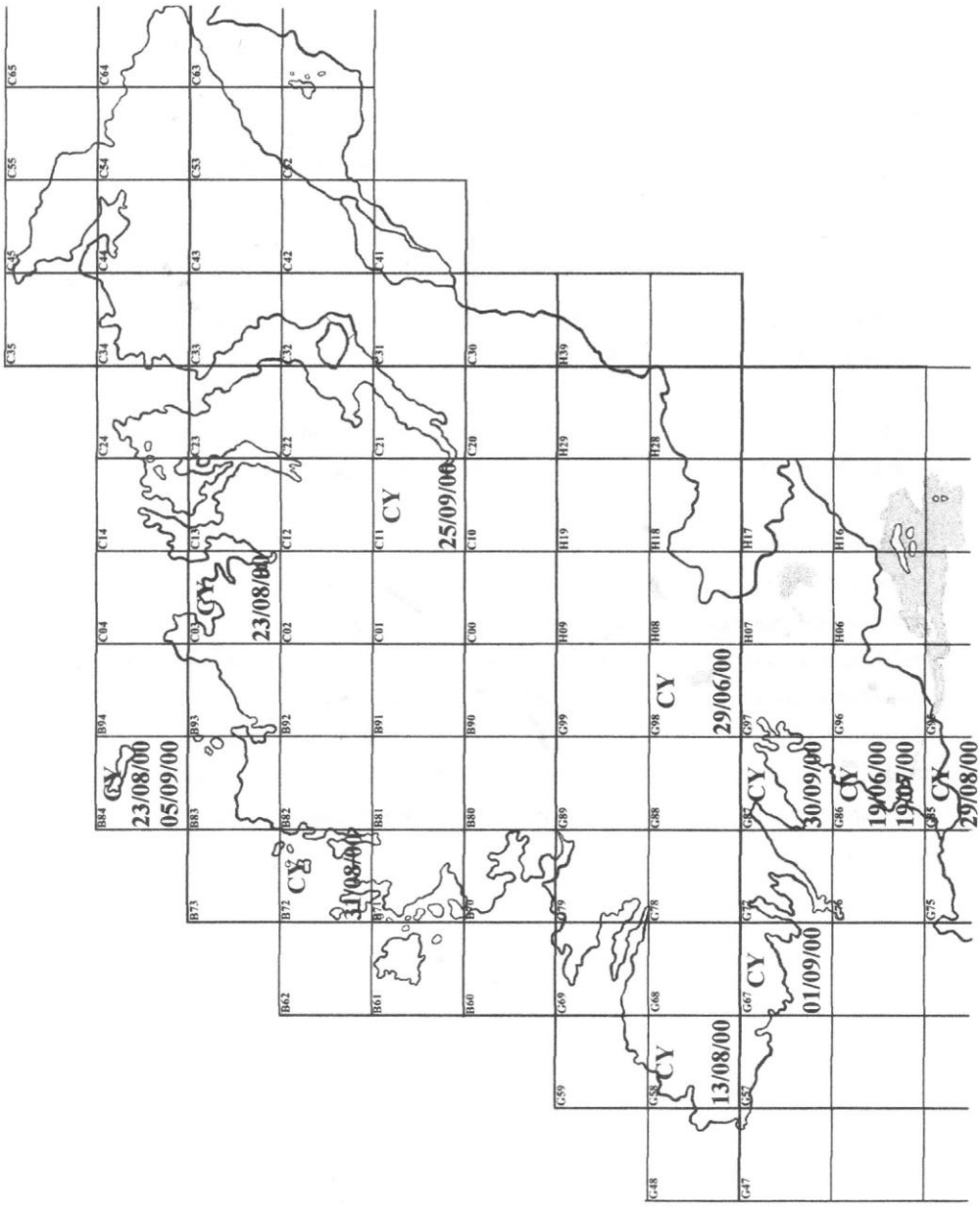

FIGURE 2. Donegal butterflies: Painted Lady (PL) 2000-2002.

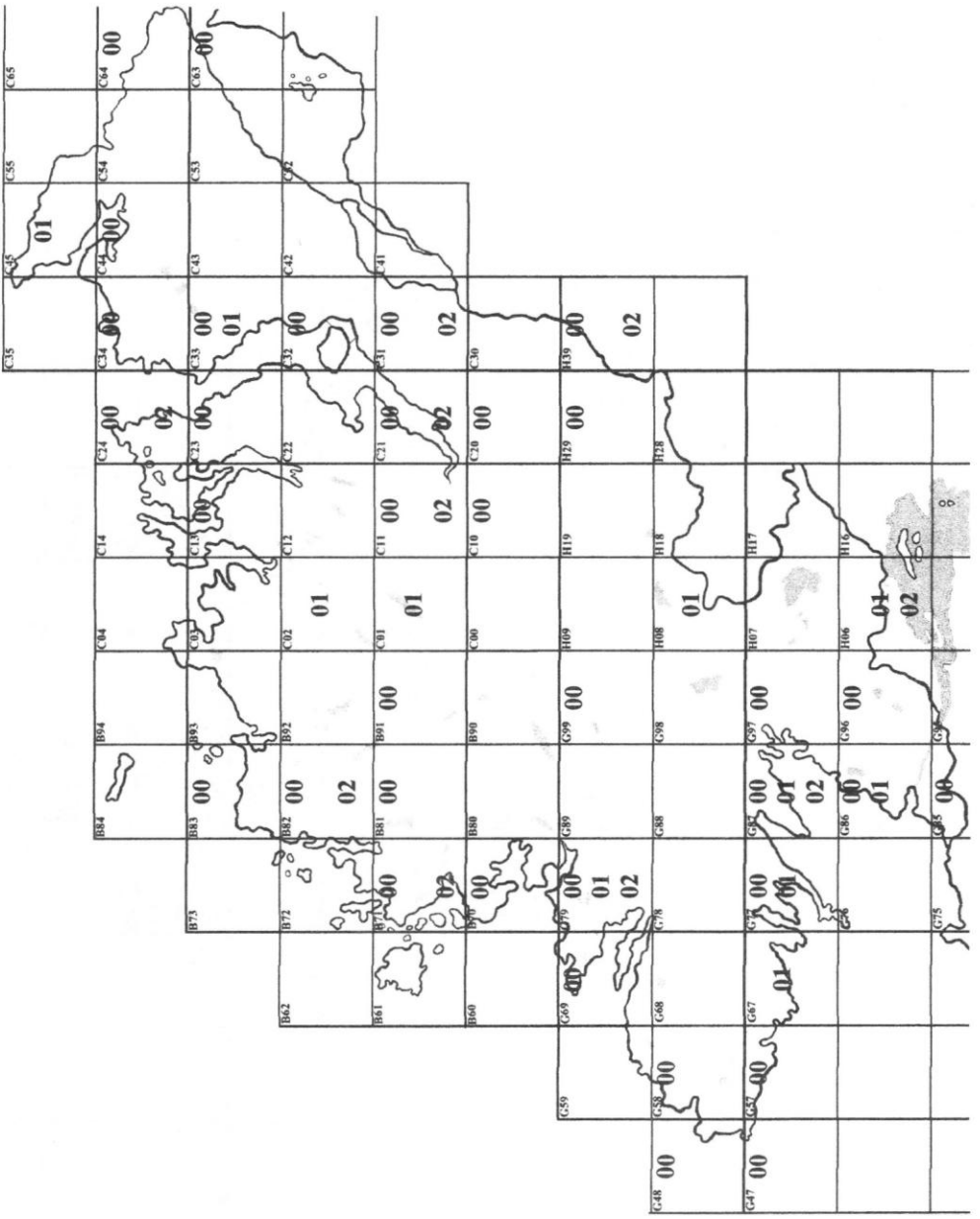

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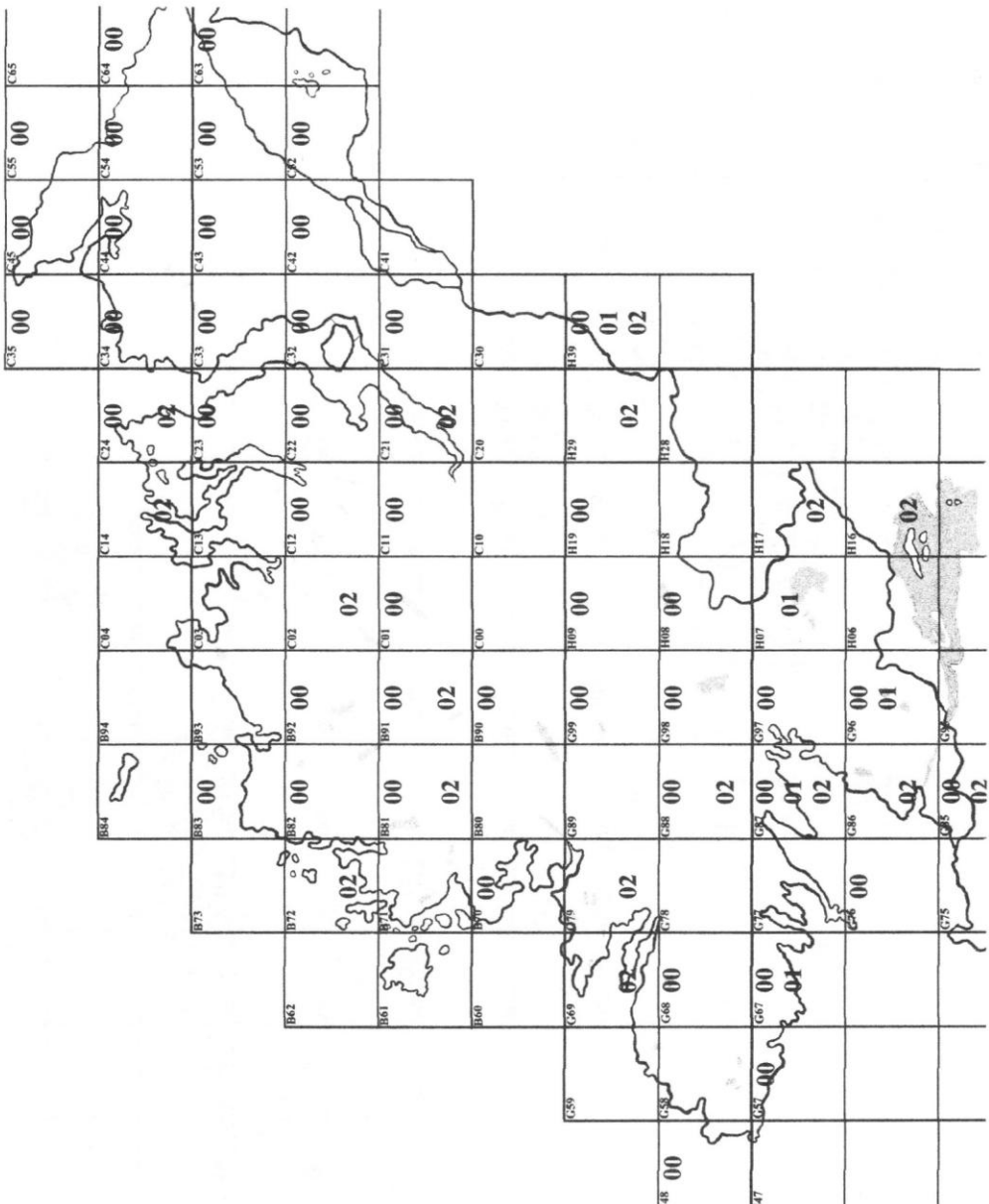
FIGURE 3. Donegal butterflies: Red Admiral (RA) 2000-2002.



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BOOK REVIEW

THE FLORA OF COUNTY CAVAN by Patrick A. Reilly. Occasional Paper No. 13 of the National Botanic Gardens, Glasnevin, Dublin. 2001. ISSN 0792-0422. Softback. 210x150mm. 177 pages including two maps plus 16 colour half plates. Available from the National Botanic Gardens, Glasnevin, Dublin 9, Ireland. 15.80 euro. UK and Europe 17.00 euro.

This is a very welcome addition to the growing list of Irish county floras and it has appeared about a year in advance of the publication of the Botanical Society of the British Isles *New atlas of the British and Irish flora* (C. D. Preston, D. A. Pearman and T. D. Dines. Oxford University Press. 2002). The fact that Paddy Reilly is also the BSBI Vice County Recorder for County Cavan ensures that the databases for the two publications are essentially identical. This proximity in publication dates enables the reader to put the flora of Cavan in context with both our national flora and that of the British Isles.

In *The Botanist in Ireland*, Praeger states that from the point of view of the botanist Cavan is merely a geographical expression, and that the county is the reverse of a natural area – shaped rather like a saucepan, with the handle formed half of Millstone Grit and Yoredale rocks and half of Carboniferous limestone, and the rest mainly of Silurian slates. He also comments that this watery region is very little known botanically. The latter deficit has been rectified by *The flora of county Cavan* and the former geographical problem by the simple stratagem of subdividing the county into five botanical districts based on 10km lines of the Ordnance Survey National Grid.

The introductory chapter of the flora make an interesting read, with sections on the sources of information, physical landscape, geology, botanical exploration, social and land-use changes. We learn, for example, about ironworks in the region and the related destruction of the native forest in 17th and 18th centuries. The landscape and botany of Cavan is currently being replaced by afforestation Irish style. The district accounts are excellent and we are given a page length introduction to each with an overview of their topography, geology together with plants of interest. The page sized topographical map shows the better known towns and villages together with some of the larger lakes and hills. To those of us who think of Cavan as consisting almost entirely of drumlins and lakes the existence of limestone areas will come as a

surprise which results in a larger and more varied flora. The flora is enhanced by the colour plates from photographs taken by the author himself.

It may take the reader a little time to come to terms with the structure of this flora especially in relation to the historical contributions of individuals. The introductory section summarises the chronological contributions from Threlkeld (1676-1728) to McArdle (1849-34). Appendix 1 lists contributions and information sources in more detail. Appendix 2 is devoted exclusively to Robert Lloyd Praeger publications post *Irish Topographical Botany* (1901). Appendix 3 lists papers, books, notes and some contributions from 1866 (post *Cybele Hibernica* records). There is also a Bibliography with more than sixty entries, which makes no mention of *ITB*. There is a wealth of information in the flora but, because of its structure, it is difficult for the casual reader to know where in the volume to look for full references. In addition, there are some missing entries in both the topographical index and the systematic section. There are a significant number of typographical errors, such as the posthumous arrival of George Dickie in Belfast, together with omissions from the indexes which include *Cuscuta epithymum* and *Potamogeton rufescens*.

A typical entry in the systematic section includes the scientific name, Irish language name and "common" name and known districts where the species has been found. This is followed by a short statement on the usual habitat or status of the species. However, it should be noted that this relates to Ireland and *not* to Cavan, as was discovered by the reviewer in relation to an apparent reference to coastal sand dunes in the county. Brief details are given on district locations, with dates and recorders for the less common species. Unusual for a modern flora there are no dot distribution maps for any species. The diligent reader should be able to extract this information from the new Atlas. For the scarcer species, records up to 1999 are included. Recent discoveries in Cavan include *Trollius europaeus* (1995) at its most southerly station in Ireland, *Sesleria caerulea* at Corratirrim (1995), the refinding of *Stratiotes aloides* (1996) in the Erne catchment and the confirmation of *Pseudorchis albida* at several stations. There is still room for debate about the status of species such as *S. aloides*. The above recent findings and the existence of some older records not recently confirmed, suggest that Cavan may well still have some further botanical secrets to be unlocked. For those who wish to keep track of escapes from horticulture and arboriculture, neophytes such as *Lonicera nitida*, *Sasa palmata*

and *Picea sitchensis* are included in this flora.

This flora of County Cavan represents a very significant additional to our store of knowledge of Irish plants and is the culmination of many years of almost entirely single-handed field work, thorough investigation of herbarium specimens and the examination of published literature and personal archives. It is also implicitly challenges other Irish botanists to organise their databases and produce their own county floras.

DAVID NASH

INSTRUCTIONS TO CONTRIBUTORS

1. Manuscripts should follow the format of articles in this *Bulletin*.

2. Manuscripts should be submitted as typed copy on A4 paper, using double-spacing and 2.5cm (1 inch) margins. Whenever possible, also submit the text on diskette. Word is preferred.

3. Figures should be submitted in a size suitable for reduction to A5 without any loss of detail.

4. Records: please ensure that, when possible, the following information is incorporated in each record included in a manuscript:-
(a) latin name of organism.
(b) statement of reference work used as the source of nomenclature employed in the text. The describer's name should be also given when a zoological species is first mentioned in the text.
(c) locality details including at least a four figure Irish grid reference (e.g. N3946), county, vice-county number and some ecological data about the collection site, plus date of capture.
(d) collector's name and determiner's name (where different from collector's name), and
(e) altitude data should be included where relevant.

(5). Manuscripts should be submitted to the Editor, Dr J. P. O'Connor, at the following address:- National Museum of Ireland, Kildare Street, Dublin 2, IRELAND.

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NOTICES

ROYAL IRISH ACADEMY
PRAEGER COMMITTEE FOR FIELD NATURAL HISTORY

Grant Information

Grants are available for field work relevant to the natural history of Ireland. Grantees need not be based in Ireland.

Applications are particularly welcome from amateur natural historians. Grants could be considered as a contribution to the cost of the project. Awards cannot be made in support of undergraduate or postgraduate student programmes, for school projects or for any part of the applicants' professional work.

Applicants should ensure that the proposed work, or work closely resembling the proposal, has not already been carried out in the same geographical area. A catalogue of previous Praeger reports can be accessed through the Academy Library.

A representative set of any material collected must be deposited in the National Museum, Dublin, or the National Herbarium, Dublin, or the Ulster Museum, Belfast or any other recognised institution in Ireland.

Application forms, which should be returned by **15th February**, are now available from:

Sara Whelan,
Praeger Committee,
Royal Irish Academy,
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Dublin 2,
IRELAND

IRISH
NATURALISTS' JOURNAL

The *Irish Naturalists' Journal*, successor to the *Irish Naturalist*, commenced publication in 1925. The quarterly issues publish papers on all aspects of Irish natural history, including botany, ecology, geography, geology and zoology. The *Journal* also publishes distribution records, principally for cetaceans, fish, insects and plants, together with short notes and book reviews.

Current subscription rates for four issues (including postage) are – €25 (£15stg); students - €8 (£5stg). Further details may be obtained from Mr Brian Nelson, Ulster Museum, Botanic Gardens, Belfast BT9 5AB (brian.nelson.um@nics.gov.uk).

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