Introduction to grassland fungi






Mark Wright August 2023

Background

This introductory guide to grassland fungi has evolved from resources prepared for a series of grassland fungi identification workshops lead by the author over a number of years. They are collated together here with the aim of enthusing people interested in knowing the names of some of our most brightly coloured fungi.

Most of the training courses I have led have been in Northern Ireland, however the contents of this guide have been enriched with several courses undertaken in partnership with National Parks and Wildlife Service as part of the Great Irish Grasslands project. The contents of this guide are equally applicable across the whole island of Ireland.

Acknowledgements

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This document is still evolving and feedback is welcome: mark.wright@daera-ni.gov.uk.

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Introduction

A variety of fungi occur on grasslands. This guide deals principally with species from the genus *Hygrocybe* (literally water or wet head) or the waxcaps. There are many other genera of fungi that occur in such habitats, and the number of taxa increases if, for example, there are trees, fallen/buried wood and variations in habitat structure present. Waxcap grasslands, as they have become known, are of conservation concern throughout Europe. In NI, Britain and Ireland, there are still significant populations of these taxa, which focuses attention and responsibility to conserve and be aware of such habitats. Sometimes so called waxcap grasslands aren't botanically diverse, and so risk being destroyed through ignorance of the presence of their mycological diversity.

This guide aims to help in the identification of species principally from the genus *Hygrocybe*[1] and provides some links to other sources of information. It utilises the waxcap key, available from Aberystwyth University Website (see links below), with imagery sourced largely from NI sites.

What are waxcaps?

Waxcaps have typically thick waxy gills, are usually brightly coloured – often shiny in appearance, and grow in a variety of grasslands (lawns, dunes, dry grasslands, calcareous and acid grasslands, old grassy boundary banks) and sometimes woodlands. With a few exceptions, they are generally absent from wet grasslands and bogs.

How do you identify waxcaps?

Their colour is the starting point, but note that individual species of fungi are phenotypically variable, and vary as a result of local environmental factors and age etc. As a result, a bit of care, and to an extent experience, is needed when deciding what colour they are! When using the key, use the main cap colour; so if the specimen is an orangey shade of red, choose red. The texture of the cap and stipe (stem) is an important feature. To decide whether either or both are sticky or viscid, a 'kiss' test is useful. The cap or stipe will stick to your dry lips if it is viscid or sticky. With a bit of experience you will get the idea! Colour changes are important in a few species and smell can be particularly useful also. You usually need to crush the stipe base lightly and cup the fungus in your hands to establish if there is a smell. There is one species with a bitter taste which can be tested very quickly on tip of tongue. No need to chew! Like any identification guide, there is a range of nomenclature which helps. I have kept these to minimum and any terms are outlined in the glossary.

Useful links

http://www.nifg.org.uk/home.htm Northern Ireland Fungus Group (NI distribution maps).

http://www.aber.ac.uk/waxcap/index.shtml Waxcap website with good detail, key, reports etc.

https://www.ukeconet.org/waxcaps-identification-intro.html Waxcap website, lots of images showing variation

http://www.bioimages.org.uk/ Is an excellent site for checking identification with detailed photographic imagery. BING and Google images are typically unreliable for fungi id work.

[1] Recent advances in molecular analysis has resulted in name changes – *Hygrocybe* is used in that general sense throughout this document, with more recent nomenclature changes highlighted in the guide section.

Glossary

Cap = Sporocarp (fruiting body sometimes used, but that is a technically incorrect term!)

Conical cap =

Convex cap =

Omphalinoid = Like a species of *Omphalina* – funnel shaped

Stipe = ‘stem’ below cap

Gills (Lamellae)= The spore-bearing surface under the cap. Looks like lots of flaps.

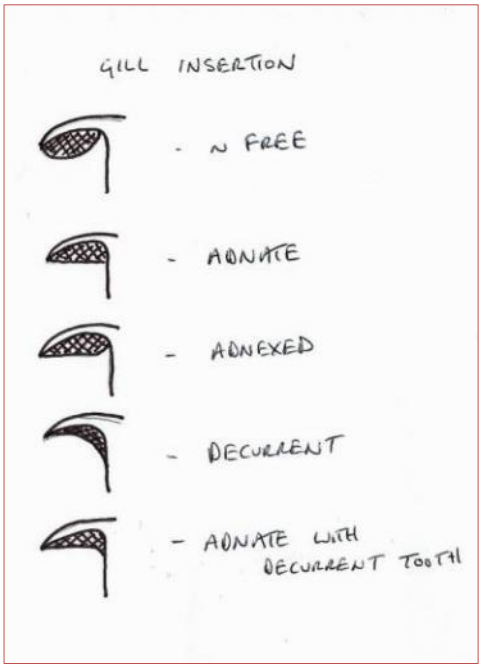
Fibrillose = Long fibres (image right)

Pruinose = Looks like the whitish bloom you get on grapes and plums

Hygrophanous= Cap which has different shading when wet and beginning to dry (image right)

Squamulose = Velvety cap (below)

Gill insertion terms below:



Waxcap Key – available online at https://www.aber.ac.uk/waxcap/what/key-main.shtml

Sheet 1

How to use the Key : :

1) Decide whether the fungi you are trying to identify is Stipe Viscid & Cap Viscid, Stipe Dry and Cap Viscid or Stipe Dry & Cap Dry (this can take a bit of practice! ☺) Viscid can mean sticky, lubricous/oily (like 'sports mixture'/ 'midget gems' sweets!), so slippery it's hard to pick.

2) Choose the 'Description of Fungi' in the left column that matches the fungi you wish to identify.

3) Look across from the 'Description of Fungi' column until a match is found. If there are more than 1 possible matches then use sheet 2 to further identify the fungi.

***Rare species; **species not recorded in NI**

Description of Fungi	Stipe Viscid & Cap Viscid	Stipe Dry and Cap Viscid	Stipe Dry & Cap Dry
Cap turning black.	*conica*	*conica*	*conica*
Cap dark grey to black, gills & flesh reddening.		*ovina**	*ovina**
Cap white/whitish – pale cream		*virginea* *russocoriacea* Go to sheet 2 section 1	*pratensis var pallida* *fornicata* Go to sheet 2 section 2
Cap or stipe with at least some green.	*psittacina var psittacina*		*citrinovirens*
Cap violet, lilac or blueish.	*lilacina***	*calyptriformis*	*calyptriformis* *lilacina*** *viola*** Go to sheet 2 section 3
Cap grey or blue-grey.	*irrigata*	*fornicata* *lacmus** *flavipes** Go to sheet 2 section 4	*fornicata* *canescens*** *nitrata* Go to sheet 2 section 5
Cap brown.	*irrigata*	*Ingrata** *spadicea*** *colemanniana* Go to sheet 2 section 6	*Ingrata** *spadicea*** Go to sheet 2 section 6
Cap yellow & conical.	*persistens*	*persistens*	*citrinovirens*

Cap yellow & convex.	*chlorophana* *vitellina** *glutinipes var glutinipes* *insipida* *citrinopallida** *xanthochroa** Go to sheet 2 section 7	*chlorophana* *ceracea* *citrinopallida** *aurantiosplendens* Go to sheet 2 section 8	*turunda*** *citrinopallida** *xanthochroa** *quieta* Go to sheet 2 section 9
Cap orange & gills free, adnate or adnexed.	*mucronella* *insipida* *xanthochroa** Go to sheet 2 section 10	*aurantiosplendens* *persistens* Go to sheet 2 section 11	*quieta* *miniata* *calciphilla** *substrangulata** *intermedia* *helobia* *reidii* Go to sheet 2 section 12
Cap orange & gills decurrent.	*insipida* *laeta* *xanthochroa** Go to sheet 2 section 13	*laeta*	*pratensis* *turunda*** *cantharellus* Go to sheet 2 section 14
Cap red & gills red.	*glutinipes var rubra*** *psittacina var perplexa** Go to sheet 2 section 15	*coccinea* *punicea* *marchii* Go to sheet 2 section 16	*mucronella* *splendidissima* *helobia* *miniata* *calciphila** *reidii* *coccinea* Go to sheet 2 section 17
Cap red & gills decurrent.	*coccineocrenata** *mucronella* Go to sheet 2 section 18		*cantharellus* *coccineocrenata** *mucronella* Go to sheet 2 section 19

Sheet 2

***Rare species; **species not recorded in NI**

Section 1:

Initial Question:	
Strong smell of Russian leather or Cedar pencils.	*russocoriacea*
Smell indistinct, mild coconut.	*virginea*

Section 2:

Initial Question:	
Gills adnate or adnexed.	*fornicata*
Gills decurrent.	*pratensis var pallida*

Section 3:

Initial Question:	
Cap narrowly conical.	*calyptriformis*
Cap convex or omphalinoid.	Section 3A
Section 3A:	
Cap < 5 mm's, omphalinoid, gills adnate.	*viola***
Cap > 5 mm's, convex, gills decurrent.	*lilacina***

Section 4:

Initial Question:	
Gills adnate or adnexed.	*fornicata*
Gills decurrent.	Section 4A
Section 4A:	
Stipe base yellow.	*flavipes*
Stipe base matches cap.	*lacmus**

Section 5:

Initial Question:	
Gills decurrent, cap felty.	*canescens***
Cap adnate or adnexed.	Section 5A
Section 5A:	
Stipe white or cream.	*fornicata*
Stipe grey to fawn, smell nitrous (bleach)	*nitrata*

Section 6:

Initial Question:	
Gills yellow.	*colemanianna*
Gills cream.	Section 6A

Section 7:

Initial Question:	
Gills adnexed or adnate.	Section A
Gills sub-decurrent to decurrent.	Section B
Section 7A:	
Stipe opaque, fungus robust.	*chlorophana*
Stipe hyaline, fungus small.	*gluttinipes var gluttinipes*
Section 7B:	
Lamellae edge viscid.	*vittelina**
Lamellae edge dry.	Section C
Section 7C:	
Stipe red at least at the apex.	*insipida*

Stipe orange, yellow or red.	Section D
Section 7D:	
Stipe orange at least at the apex.	*xanthochroa**
Stipe white or yellow at the apex.	*citrinopallida**

Section 8:

Initial Question:	
Lamellae distinctly decurrent, stipe yellow or white.	*citrinopallida**
Lamellae otherwise.	Section A
Section 8A:	
Stipe fibrillose or pruinose at least at apex.	*aurantiosplendens*
Stipe smooth.	Section B
Section 8B:	
Stipe < 5 mm's diameter.	*ceracea*
Stipe > 5 mm's diameter, often grooved.	*chlorophana*

Section 9:

Initial Question:	
Cap yellow or orange with dark squamules.	*turunda***
Cap smooth or finely pruinose.	Section A
Section 9A:	
Fungus robust, stipe > 5 mm's diameter.	*quieta*
Fungus delicate, stipe < 3 mm's diameter.	Section B
Section 9B:	
Stipe violaceous at apex, spores 6-7.5 mu x 4-5 mu.	*xanthochroa**
Stipe pale yellow or white, spores 8-10 mu x 4.5-5 mu.	*citrinopallida**

Section 10:

Initial Question:	
Cap reddish-orange, taste bitter.	*mucronella*
Cap yellowish-orange, taste neutral.	Section A
Section 10A:	
Fungus robust, stipe > 5 mm's diameter.	*xanthochroa**
Stipe reddish, at least at the apex.	*insipida*

Section 11:

Initial Question:	
Stipe smooth, lamellae adnate.	*aurantiosplendens*
Stipe fibrillose, lamellae free or adnexed.	*persistens*

Section 12:

Initial Question:	
Pileus squamules or tomentose.	Section 12A
Pileus smooth.	Section 12E
Section 12A:	
Lamellae free or adnexed, stipe fibrillose.	*intermedia*
Lamellae adnate or decurrent.	Section 12B
Section 12B:	
Cap bright red, fragile, smell of garlic.	*helobia*
Cap orange or dull red, tough, no smell.	Section 12C
Section 12C:	
Spores 9-12 mu long.	*substrangulata**
Spores 7.5-9 mu long.	Section 12D
Section 12D:	

Spores Triangular.	*miniata*
Spores oblong.	*calciphila**
Section 12E:	
Cap yellow, smell of *Lactarius quietus.*	*quieta*
Cap orange to orange-red, smell of honey at least in stipe base.	*reidii*

Section 13:

Initial Question:	
Lamellae edge viscid, stipe dull.	*laeta*
Lamellae edge dry, stipe red or orange.	Section 13A
Section 13A:	
Stipe red at least at apex.	*insipida*
Stipe orange, hyaline, sometimes with violet.	xanthochroa*

Section 14:

Initial Question:	
Fungus robust, cap dull matt orange.	*pratensis*
Fungus small.	Section 14A
Section 14A:	
Cap orange with dark squamules.	*turunda***
Cap edge scalloped, wettish habitats	cantharellus

Section 15:

Initial Question:	
Fungus brick red, cap convex.	*psittacina var perplexa**
Fungus orange red, cap applanate.	*glutinipes var rubra***

Section 16:

Initial Question:	
Fungus robust, stipe fibrillose.	*punicea*
Fungus small, stipe smooth.	Section 16A
Section 16A:	
Lamellae red, at least at base.	*coccinea*
Lamellae pale.	*marchii*

Section 17:

Initial Question:	
Pileus squamulose.	Section 17A
Pileus smooth or finely pruinose.	Section 17C
Section 17A:	
Fungus scarlet, squamules pointed, faint smell of garlic.	*helobia*
Fungus red, orange or yellow, squamules obtuse.	Section 17B
Section 17B:	
Spores triangular.	*miniata*
Spores oblong.	*calciphila**
Section 17C:	
Taste bitter.	*mucronella*
Taste neutral or mild.	Section 17D
Section 17D:	
Fungus medium to large, bright red.	*splendidissma*
Fungus small to medium, orange red.	Section 17E
Section 17E:	

Lamellae yellow or orange, smell of honey in stipe base.	*reidii*
Lamellae red with yellow edge, smell neutral.	*coccinea*

Section 18:

Initial Question:	
Taste bitter, cap typically viscid	*mucronella*
Taste mild, cap typically dry and with drak squamules	*coccineocrenata**

Section 19:

Initial Question:	
Cap smooth, taste bitter.	*mucronella*
Cap squamulose.	Section 19A
Section 19A:	
Squamules concolourous with cap.	*cantharellus*
Squamules distinctly dark.	*coccineocrenata*

Snowy Waxcap in acid grassland Rathlin Island.

Notes on reference guide

The images and notes are arranged in a similar order to the key. Not all species have images, the focus being on the more common taxa. The main features are added together with a 'simple' assessment of how common the species is. Images are copyright Mark Wright unless otherwise stated.

Books

The 'Aberystwyth' key is based on a book by David Boertmann. This is the standard reference. Most general fungi books don't include all the species that you might come across and so tend to be frustrating to use.

Boertmann, D. (2010). The Genus *Hygrocybe,* 2nd revised edition. Fungi of Europe – vol 1. Svampetryk

Most recent nomenclature (brackets below) follows Kibby, G. (2020). *Mushrooms and Toadstools of Britain & Europe*. Vol 2 Agarics – part 1.

NI Waxcaps – quick reference guide

Hygrocybe conica Blackening Waxcap

Orange, red and yellow coloured (variable), conical. Turns black on handling and with age. Stipe and cap sticky. Gills more or less free. Very common in wide range of habitats and can be locally very abundant, e.g. on sand dunes.

***Hygrocybe ovina* Blushing Waxcap** (*Neohygrocybe ovina* in some recent books)

A ‘chunky’ darkish grey-brown waxcap, that darkens with age and bruises reddish (see image). Fairly rare in NI, but easy to miss because of the brownish colour and suggestion that it looks like sheep’s dung!?

***Hygrocybe virginea* Snowy Waxcap** (*Cuphophyllus virgineus* in some recent books)

White, dry stipe, cap slippery/oily. No smell. Gills decurrent. There are several colour varieties. Very Common, and quite beautiful!

***Hygrocybe russocoriacea* Cedarwood Waxcap** (*Cuphophyllus russocoriaceus)* in some recent books)

White to creamish-white cap, slender species with decurrent gills and strong smell of cedar wood or pencil sharpenings (not a plastic pencil!). Usually appears later in the season, fairly frequent on acid grasslands. The image below is very typical of the actual colour – usually not just as white as *H. virginea*!

***Hygrocybe pratensis var. pallida* Pale Waxcap** (*Cuphophyllus berkeleyi* in some recent books)

Similar to *H. virginea* but a more robust species with a dry cap; a variety of the more common Meadow Waxcap *H. pratensis* which is an orange/buff coloured species.

Hygrocybe fornicata Earthy Waxcap

(*Cuphophyllus fornicatus* in some recent books)

(c) David Mitchel.

Cap white, whitish brown or whitish grey. Stipe and cap dry to greasy in young specimens. Usually a quite robust species. Gills more or less adnate. Widespread but usually not common

Hygrocybe psittacina var *psittacina* Parrot Waxcap (*Gliophorus psittacinus* in some recent books)

Quite variable in colour but always with some green at apex of stipe underneath gills. Cap and stipe very viscid – can be quite hard to pick! Cap greenish, orange, yellow orange or lilac colours. When old usually an orange colour, hygrophanous. Very very common in all sorts of grasslands.

Hygrocybe citrinovirens Citrine Waxcap

Lemon yellow conical cap, often with a hint of green. Cap radially fibrillose, smooth finely fibrillose stem. Not particularly common.

Hygrocybe calyptriforis Pink Waxcap (*Porpolomopsis calyptriformis* in some recent books)

Unmistakable, beautiful species with pink conical cap and usually long whitish stipe. Sometimes known as the 'Ballerina'. Widespread, though typically found on old lawns in my experience.

***Hygrocybe irrigata* Slimy Waxcap** (*Gliophorus irrigatus* in some recent books)

Greyish brown or slate grey cap. Very, very, slimy cap and stipe. Easily overlooked.

***Hygrocybe lacmus* Grey Waxcap** (*Cuphophyllus lacmus* in some recent books)

Greyish, greyish brown striate cap with white stipe. Gills decurrent. Uncommon in NI, acid grasslands/heath mosaics.

Hygrocybe nitrata **Nitrous Waxcap** (*Neohygrocybe nitrata* in some recent books)

Greyish brown species; cap smooth when young but then breaking into scales. Smells of bleach or ‘swimming pool’. Widespread, but nowhere really common.

Hygrocybe colemanniana **Toasted Waxcap** (*Cuphophyllus colemannianus* in some recent books)

Soft reddish brown cap, with pale buff decurrent gills. Cap slightly greasy. A species typically of base-rich grasslands in NI.

Hygrocybe flavipes Yellow Foot Waxcap
(*Cuphophyllus flavipes* in some recent books)

Medium sized, greyish to greyish brown species with white stem and yellowish stipe base. Gills decurrent, tough and with interveining. Uncommon in NI.

Hygrocybe spadicea Date Waxcap

(image copyright David Mitchel.) Not yet recorded in NI, though has been found in Galway. Worth looking for; characterised by the dark brown cap contrasting with the bright yellow gills and yellow stipe with brown fibres.

Hygrocybe vitellinus Glistening Waxcap (*Gloioxanthomyces vitellinus* in some recent books)

(insert image copyright David Mitchel.) A small (usually <15mm wide), bright chrome yellow species with decurrent gills that have a viscid edge (see insert). Usually acid grasslands and sometimes mossy woods.

Hygrocybe ingrata **Dingy Waxcap** (*Neohygrocybe ingrata* in some recent books)

A rare species in NI (known only from Barnett's Park). Large and robust species. Brownish cap, cream coloured gills which bruise red. Stipe also bruises red and the species has a faint bleach smell.

Hygrocybe persistens **Persistent Waxcap** (now called Hygrocybe *acutoconica*)

Yellow to orange conical cap. Cap and stipe viscid. Gills more or less free. Stipe longitudinally fibrillose. Widespread and occasional. (Bottom image copyright David Mitchel)

Hygrocybe chlorophana Golden Waxcap

Yellow to orange, rounded, later flattened cap which is viscid. Stipe smooth, viscid or moist, often with longitudinal groove. Gills adnate-free. Widespread and frequent.

Hygrocybe ceracea Butter Waxcap

Small yellow species, adnate to decurrent gills, viscid cap and dry stipe. Can be confused with *H. insipida* which is usually more orange, with viscid stipe and striate cap. Fairly widespread but often overlooked.

***Hygrocybe aurantiosplendens* Orange Waxcap** Medium sized, orange-yellow species, oily to viscid hygrophanous cap, smooth dryish stipe, often covered in white dust. Sometimes difficult to tell from *H. chlorophana* and microscopy is thus often required to confirm. Fairly widespread.

***Hygrocybe quieta* Oily Waxcap**

Medium sized orange/yellow species. Usually with orange gills and with an oily smell when crushed. Fairly widespread.

Hygrocybe insipida Spangle Waxcap

A small yellow/red species, wet cap and stem, gills slightly decurrent or with decurrent tooth. Widespread and very common species. Taste the cap to check it's not *H. mucronella* [below]!

Hygrocybe glutinipes Glutinous Waxcap (c) David Mitchel

A small slender yellow species with very viscid cap and stipe. Gills adnate to slightly decurrent. Occasional.

Hygrocybe mucronella Bitter Waxcap (c) David Mitchel

Very similar to *H. insipida*, but with a pronounced bitter taste when you place cap on tip of tongue!

Hygrocybe miniata Vermilion Waxcap [left] (c) David Mitchel

Typically a small bright red species of very acid/mire. Distinctly velvety cap and adnate gills. Usually needs confirmed by microscopic examination of spores. Fairly widespread.

Hygrocybe cantharellus Goblet Waxcap [below]

Similar to *H. miniata* but more orange and with decurrent gills. The one reasonably common species occurring on boggy ground

Hygrocybe calciphila Limestone Waxcap

Similar to *H. miniata* (above) but found on dunes or calcareous grassland. Quite rare in NI. Microscopic examination is usually required to confirm identification.

Hygrocybe helobia Early Waxcap [below] (c) David Mitchel

Small bright red species with velvety cap. Tends to be fragile and usually appears early in the season. Has a faint smell of garlic (need to leave it in a small box for an hour!) Uncommon in NI, but probably under-recorded.

Hygrocybe intermedia Fibrous Waxcap

A chunky dry species with an obviously fribrillose stem and cap. Often fruits early in the season. Uncommon.

Hygrocybe reidii Honey Waxcap

Small to medium sized, often gregarious, orange species, dry cap and decurrent gills. Crushing the stem base reveals a strong honey smell characteristic of the species, often more pronounced when dries. Widespread and fairly common.

Hygrocybe coccinea

Scarlet Waxcap

Medium-sized species with scarlet lubricous cap, and broadly adnate gills. Small specimens can be confused with *H. Insipida*. Common on dry grasslands of all types.

Hygrocybe punicea Crimson Waxcap

A typically large species with blood red, orange red to brownish red lubricous cap. Stipe is fibrillose usually white at very base. Gills adnate. Frequent but can be locally very abundant in 'good' years.

Young *H. punicea*

Hygrocybe splendidissima Splendid Waxcap

Similar in stature to *H. Punicea* but with a very bright red and dryish cap and smooth stipe. This species also smells of honey when crushed, particularly when it becomes dry. Occasional.

Hygrocybe pratensis **Meadow Waxcap** (*Cuphophyllus pratensis* in some recent books)

A fairly large species. Cap with a dull orange, buff skin colour. Decurrent gills. Widespread. Said to be edible – never tried it! Note there is a white variety var *pallida,* which differs only in its whitish colour (see beginning of this section).

Hygrocybe laeta
Heath Waxcap
(*Gliophorus laetus* in some recent books)

Smallish species typically found on more acid grasslands. Very, very, viscid cap and stipe, and with a hand lens you should see the viscid layer extending over gill edge. Gills decurrent. Smells unmistakably of rubber/tyres/latex.

Other grassland fungi you may come across...

Cystoderma aminianthinum **Earthy Powdercap**

Pinkgills and fairy Clubs

Entoloma bloxamii Big Blue Pinkgill

Entoloma porphyrophaeum Lilac Pinkgill

Entoloma serrulatum Blue Edge Pinkgill

Clavulinopsis corniculata Meadow Coral

Clavaria fumosa Smokey spindles

Clavaria zollingeri Violet Coral

Earth tongues and some other grassland species

Microsglossum olivaceum

Trichoglossum hirsutum

***Mucilago crustacea* (slime mould)**

***Onygena equina* Horn stalkball** (on sheeps horn)

***Rickenella fibula* – Orange Mosscap**

***Panaeolus papilionaceus* Petticoat Mottlegill** -

Grassland fungi and conservation

During the 90s the conservation significance of grasslands containing species of waxcap and other taxa in a European context became apparent to mycologists. A survey programme was initiated by the British Mycological Society of potentially interesting waxcap grasslands; most of the UK also made efforts to survey sites. Around the same time a book on waxcaps was published by David Boertmann, meaning for the first time there was a good, affordable, reference work to support identification which previously had been hampered by various taxonomic uncertainties.

CHEG

A system of ranking grasslands based on their 'CHEG' score was developed in the late 90s. This relied on some knowledge of fungal identification but could be carried out by observant naturalists who could tell species apart even if they couldn't name them. The score was simply a totalling of the number of different species in the following groups:

C = species in clavariaceae (fairly clubs)

H = species of *Hygrocybe* (waxcaps)

E = species of *Entoloma* (Pinkgills – a large and difficult group with 100s of species)

G = species in geoglossaceae – Earth tongues – typically dark-coloured tongues.

A score can be assigned on one visit or combined over several visits which is usually necessary with fungi.

Example site

Binevenagh ASSI	Total species	C (4) H (21) E (14) G (5)
	Maximum in one visit	C (3) H (15) E (11) G (4)

Published research by European mycologists suggested sites with 15 or more species of waxcap recorded in one visit may be of international importance and sites with between 11 and 14 being of national significance. Because of the different scoring methodologies and because most of the published research was specifically relevant to mainland Europe, the author, with several colleagues established an Irish scoring system to provide a basis of evaluating Irish sites. This system, outlined below, has been used by Northern Ireland Environment Agency to support designation of important grasslands for their fungi and formed part of the rationale in the Joint Nature Conservation Committee guidelines on selection of sites. The scoring system is relatively easy to use provided one can reasonably distinguish waxcap species and can recognise other fungi that indicate 'good' waxcap grasslands.

Irish grassland scoring system

This Irish grassland scoring methodology has three classes—A, B and C (see Table). The A class relates to an already published GB list of particularly rare *Hygrocybe*; B class comprises a further GB list with species

of *Hygrocybe* that appear to be rare in Ireland; and selected species from other genera that rank highly in the various European published research. Class C includes all other common species of *Hygrocybe* and *Clavulinopsis fusiformis*, a very recognisable species that is ranked slightly higher by some European mycologists. Further detail and the rationale is provided in the paper by McHugh *et al* cited below. The score is calculated by simply summing the values once you have a list of the relevant species from a site.

Given the increase in data on such grasslands over the past 20 years, this approach is due to be reviewed.

Table —Irish grassland species quality scores, *sensu* McHugh et al 2001.

Species	*Class*	*Score*
Clavaria zollingeri	A	4
Entoloma bloxamii	A	4
Entoloma incanum	A	4
Hygrocybe ingrata	A	4
Hygrocybe lacmus	A	4
Hygrocybe nitrata	A	4
Hygrocybe ovina	A	4
Hygrocybe punicea	A	4
Hygrocybe splendidissima	A	4
Microglossum olivaceum	A	4
Porpoloma metapodium	A	4
Trichoglossum walteri	A	4
All other species of Geoglossaceae	B	2
Clavaria fumosa	B	2
Clavulinopsis umbrinella	B	2
Dermoloma cuneifolium	B	2
Entoloma porphyrophaeum	B	2
Entoloma pratulense	B	2
Entoloma prunuloides	B	2
Entoloma roseum	B	2
Hygrocybe aurantiosplendens	B	2
Hygrocybe pratensis var pallida	B	2
Hygrocybe calciphila	B	2
Hygrocybe calyptriformis	B	2
Hygrocybe citrinopallida	B	2
Hygrocybe citrinovirens	B	2
Hygrocybe colemanniana	B	2
Hygrocybe constrictospora	B	2
Hygrocybe flavipes	B	2
Hygrocybe fornicata	B	2
Hygrocybe glutinipes	B	2
Hygrocybe helobia	B	2
Hygrocybe intermedia	B	2
Hygrocybe irrigata	B	2
Hygrocybe phaeococcinea	B	2
Hygrocybe quieta	B	2
Hygrocybe radiata	B	2
Hygrocybe vitellina	B	2
Hygrocybe xanthochroa	B	2
Ramariopsis kunzei	B	2
All other species of *Hygrocybe*	C	1
Clavulinopsis fusiformis	C	1

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