

The genera *Galerina* Earle and *Phaeogalera* Kühner (Basidiomycetes, Agaricales) in Iceland

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ABSTRACT: The diversity of the agaric genera *Galerina* and *Phaeogalera* in Iceland is recorded. Twenty taxa are recognised of which 12 are new to the island. Taxonomic, mycogeographical and ecological aspects are discussed. *Galerina perplexa* A.H. Sm. is recorded as new to Europe and *G. subclavata* Kühner as new to North America. It is shown that the European species *G. pseudotundrae* Kühner is the same species as the American *G. lubrica* A.H. Sm. A new form, forma *quadrispora* Gulden, of *G. atkinsoniana* var. *atkinsoniana* is described. *Galerina acris* Gulden is reduced to synonymy of *G. badipes* (Fr.) Kühner and *G. pseudotundrae* Kühner to synonymy of *G. lubrica* A.H. Sm. A key for determination is provided.

KEY WORDS: *Galerina*, *Phaeogalera*, Iceland, mycogeography, taxonomy.

INTRODUCTION

Location, prevailing ecological conditions, and vegetation. Iceland is an island of 103.000 km² and is situated just south of the Arctic circle in the North Atlantic Ocean. It is entirely of volcanic origin, mainly basaltic rocks from the Tertiary, and the surface is to a great extent covered by moraine material from the last glaciations and also by recent lava flows. Most of the island is a highland plateau of between 300 and 700m altitude and the highest part reach about 2000 m a.s.l.

The climate is mainly oceanic. A rather continental climate, however, is found inland in the Northeast. The mean temperatures of the warmest month (July) range from + 8° to + 12° C in different parts of the island and that of the coldest month (February) from – 6° to 0° C. In the valleys of NE Iceland maximum temperatures in summer may reach + 30° C and in winter – 30° C. Northern parts of the island are normally covered by snow from December to April, and snowdrifts may remain until July in cool summers. The precipitation varies considerably, from ca 3-4000 mm on the glaciers in SE Iceland to ca 500 mm in the NE highlands. Fog is common only in the eastern fjords during summer. Cool NE-winds prevail in summer and mild SW-winds in winter.

Soil and vegetation cover only 1/3 of the country. In central parts of the island, the Central Highlands, there is an edaphic desert, the most extensive in Europe, where only occasional oases are found at springs and along spring fed

brooks and rivers. Considerable masses of sand are removed by strong winds and depositions of sand and dust constitute the main part of the soil layer (loess) in Iceland. It is highly susceptible to erosion. The dry surface layers generally have a pH range of 5.5–6.5 while that of the wetlands ranges from 5–5.7; the most basic parts of Iceland are the NE while the western fiord areas are more acid. Around the geysirs and hot springs the pH can be much lower.

The vegetation is mainly composed of grassland, swamps and bogs. Iceland is a “moss-land” par excellence and mosses occur in almost every type of vegetation. Carpets of *Racomitrium lanuginosum* cover extensive land areas, especially in the Southwest. In the Highlands and in the northern, higher parts of the island a snow-patch vegetation with *Salix herbacea* often dominates. It has been estimated that about 25% of the island was forested when Iceland became populated almost 1200 years ago. Today, birch woods (*Betula pubescens* and *B. tortuosa*) cover only about 1% of the total area; the most luxuriant virgin forests remain in the valleys of E and NE Iceland. Here birches, 10 m high, are common. Moreover, there are occasional trees of rowan (*Sorbus aucuparia*) and aspen (*Populus tremula*). Some species of *Salix* (*S. phylicifolia* and *S. lanata*) are very common. The timberline is at about 3–400 m in the north and east.

Since 1900, a number of foreign trees have been introduced to the country and some have thrived well in suitable sites. For example, the Siberian larch (*Larix russica/sibirica*) thrives well in the most continental districts and Sitka spruce (*Picea sitchensis*) in the oceanic south.

The Icelandic flora is mainly of European origin; about 80% of the indigenous vascular plants are shared with Scandinavia. Of the about 450 species, only six (of North-American origin) are not found in other parts of Europe. More than 25% have a circumpolar distribution. More than half of the species can be referred to as boreal while arctic-alpine species comprise only about 33% (Einarsson 1963). Similarly, the moss and lichen floras are almost exclusively of Scandinavian origin. According to STEINDÓRSSON (1964) about 48% of the vascular plant flora endured the last glaciation in Iceland and 20% were introduced by man.

History of mycological exploration - macromycetes. The first person to study the agarics of Iceland was POUL LARSEN who travelled and collected in Iceland during mid-summer 1922. He described 140 species of macromycetes in the resulting book published in 1932. Before that, only 20 macromycetes had been reported from the country (ROSTRUP 1903), including the first mention of a probable *Galerina* (*Galera hypnorum* (Schränk) Fr.). In 1941 another important contribution to the study of Icelandic macromycetes appeared, written by M. P. CHRISTIANSEN, who collected for one month in the summer of 1935. He contributed with 68 new macromycetes to the list. In 1947 and 1959 Morten Lange collected in Iceland. His findings from the first trip were published in 1949; the material from 1959 is largely unidentified and kept at the Natural History Museum in Akureyri. Since 1960 HELGI HALLGRÍMSSON has collected and published several articles on Icelandic fungi, among them a preliminary checklist of Basidiomycetes (1993) and a history of mycological research in Iceland (1989).

In the checklist all species of *Galerina* and *Phaeogalera* previously recorded from Iceland are listed and two more added. According to this list 11 species of *Galerina* occur in Iceland. These are further discussed in various parts of the present paper. *Conocybe* species may sometimes be strikingly similar to galerinas. The species of *Conocybe* known to occur in Iceland (17 species) have been treated by WATLING (1985). The lignicolous jelly fungi and Aphyllophorales presently known in Iceland are reported on in HALLGRÍMSSON & HAUERSELV (1995).

MATERIAL AND METHODS

Material. A total of 306 *Galerina* and *Phaeogalera* collections were examined. The main part originates from N and NE Iceland where Helgi Hallgrímsson (HH) has collected, described, and photographed these fungi since 1962. His material comprises a little less than 100 collections. In 1993 Gro Gulden (GG) visited Iceland on the occasion of a Northern Mycological Congress at Hallormsstaður and spent eight days collecting in conjunction with the congress, mainly in northern parts of the island (about 100 collections).

In 1959 Morten Lange (ML) made 38 collections of *Galerina/Phaeogalera* in S and SW Iceland. These and a further 75 herbarium collections, mainly from southwestern parts of Iceland, comprise the rest of the material. Little collecting has been done in Central parts of Iceland, and there are no collections from southeastern parts. GG's collections are kept at the Botanical Museum in Oslo (O), the rest in the Natural History Museum in Akureyri (AMNH).

Methods. The descriptions of gross-morphology relate to Icelandic material and are obtained from descriptions/notes and/or photos and drawings of the fresh specimens. In many cases this information is scanty and the descriptions do not reflect the entire variation of the species. Features of the dry material are sometimes added within brackets. The colour citations in parentheses are from J. E. Lange's colour map, published in LARSEN (1932).

Microscopic preparations were studied in 5% KOH using normal light objectives and phase contrast objectives. For examination of dextrinity spores mounted in Melzer's reagent were compared with spores mounted in H₂O. In compiling spore statistics, 10-20 spores were measured per collection and abbreviations are as follows: $Av(n/N)$ = average spore size from measurements in n spores in N collections, Q = range of length /width ratios, Q_{av} = average of length/width ratios. The measurements are made of spores deposited on the cap surface or on stipe apex. The size of the cheilocystidia is indicated as follows: length x width of ventral inflation x width of neck x width of head (if present).

Microscopy of *Galerina* and *Phaeogalera*. The genera are blessed with many distinct microscopic features such as large and polymorph cystidia that are present both in the hymenium and in cortical tissues. Clamp connections are present in most species, but absent or rare in a few. Quite a lot of species have 2-spored basidia. Furthermore there is a substantial polymorphism in shape, size, and ornamentation of the spores. Some of these structures are a bit tricky to sort out or to describe adequately. The following text explains some of our concepts.

Sterile tissues. A viscid surface is present in some species. This grades into sticky, lubricous or fatty (fatty-shiny) surfaces. Ideally a viscid surface can be traced in microscopic preparations of the cap cuticle (pileipellis) in fresh as well as in dried specimens (Fig. 1, 4). In KOH mounts a gelatinous matrix separates the hyphae of the viscid layer. With phase contrast equipment this matrix can sometimes be seen as a nebulous shadow. In a section of the pileipellis the gelatinous layer always appears paler than the underlying layer because of the matrix and because the gelatinised hyphae normally are hyaline or less heavily incrustated than the hyphae of the underlying layer. They also lie scattered and not densely packed as in the underlying layer. The gelatinised hyphae are normally narrow (1–3 μm) and oriented parallel to the cap surface (forming an ixocutis). They often appear flexuous or curled. Probably the aspect of the gelatinised layer varies according to the age of the fruitbodies and according to weather conditions. In a harsh climate the pileipellis normally becomes much modified by weathering. Probably too much emphasis has been placed on this characteristic in the current classification of *Galerina*, especially in the subgenus *Naucoriopsis*, and we advise that the characteristic of a viscid cap be used carefully.

We have generally not included descriptions of sterile tissues such as pileipellis, stipitipellis or hymenophoral trama, since we find these are of little help for identification of taxa. For the rarer taxa we have described these structures.

Basidia and spores. The basidia in most species have a constriction, generally in the upper part of the basidium (Fig. 1, 3); occasionally the constriction is about in the middle or below. We have used the term 'constricted' in our descriptions. The basidiols in these species mostly have a distinctly delimited, narrower upper part. The taxonomic importance of this feature is uncertain. Two-spored basidia mostly do not show this feature, and they generally are narrow at apex and have stout sterigmata.

The spore size in the Icelandic *Galerina* range from 8.8 – 14.7 μm in length and 5.5 – 8.5 μm in width (average sizes). *Galerina stordalii* has the smallest spores with an average size of 8.8 x 5.5 μm (Fig. 2, 1). The largest spores has *G. subclavata* with the average size 14.0 x 8.0 μm . Also *Phaeogalera stagnina* has fairly large spores with an average size of 13.1 x 7.9 μm (Fig. 2, 2). Average lengths around 10 μm and widths around 6 μm are very common. The average Q value (Q_{av}) lies between 1.5 and 1.9. When Q_{av} is 1.7 or higher the spores are called narrow. When Q_{av} is 1.5 many of the spores appear rather broad.

The *plage* of the spores is usually quite distinct, even in practically smooth spored species. The plage is always paler than the rest of the spore. In face view a pale, totally smooth (not even marbled) patch is seen above the apiculus, often delimited by a 'plage line'. Sometimes a \pm loose *perispore* (an outer wall layer) borders the plage area. In profile view the plage is often seen as a straight course of the dorsal wall outline just above the apiculus and this is generally delimited by a minute 'hump' at the upper end (Fig. 2, 3). Sometimes a pale, narrow region (the plage) can be seen on the inner side of this straight part of the outline.

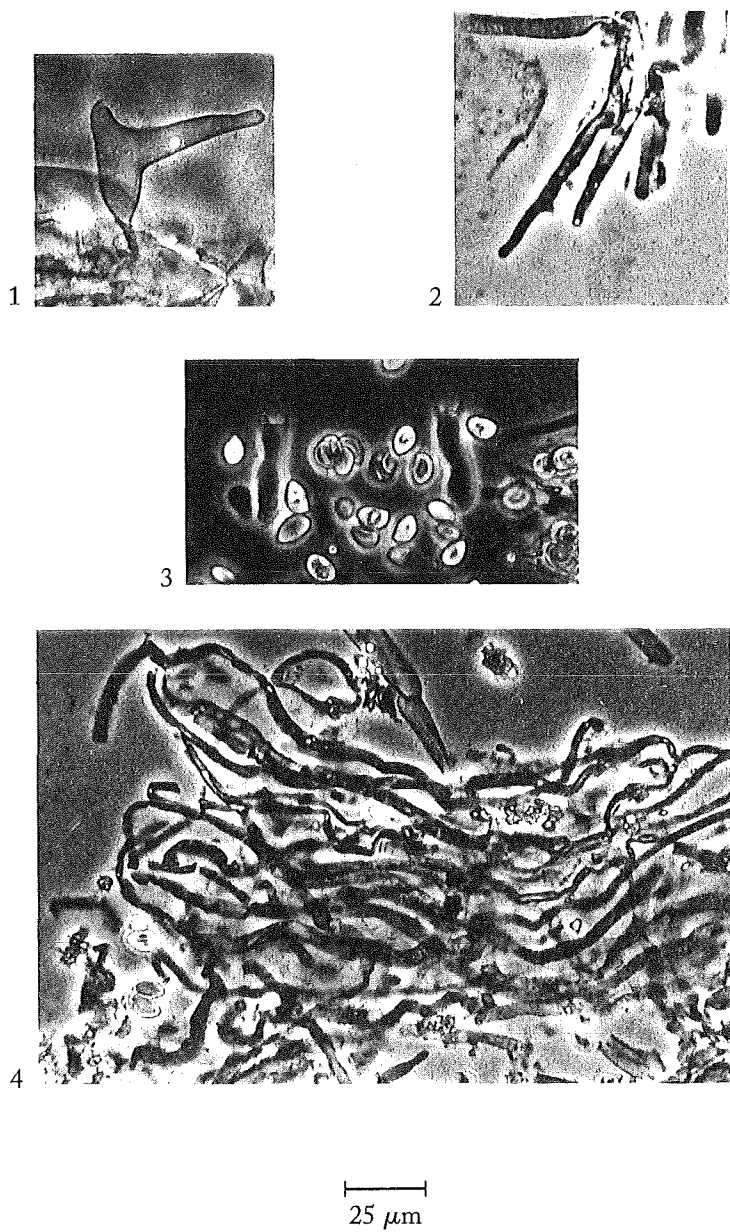


FIGURE 1. Micromorphology of *Galerina*. 1, 1. *Galerina atkinsoniana* var. *atkinsoniana* f. *quadrispora* (GG 131/93), pileocystidium. 1, 2. *G. perplexa* (HH 12754), pileocystidia. 1. 3. *G. vittiformis* var. *vittiformis* f. *tetraspora* (HH 11011), constricted basidia. 1, 4. *G. autumnalis* (Denver 17621) hyphae in gelatinous layer of pileipellis.

In some species the spore wall appears equally thick at apex as in the rest of the spore, but in many species the spore wall is thinner at the apex, often in conjunction with a \pm extended snout. This does not call for a special term. The terms *callus* and *pore* have been used to address a \pm distinct discontinuity or thinning at the spore apex; different authors have applied them rather inconsistently. We have tried to use the term *pore* for a discontinuity in all wall layers and *callus* for a discontinuity either in the inner, paler endospore or in the outer, more pigmented episporium. But sometimes a clear distinction between a pore and a callus is impossible. Presence of a loose perispore may complicate the picture further. As a result, we have oftentimes ended up with the designation 'callus/pore' for a \pm distinct discontinuity seen at the spore apex with light microscopy equipment. The species in our material that have spores where we prefer to use the term *pore* are *G. stordalii* (Fig. 2, 1), *G. pseudomycesopsis*, *G. badipes* and *P. stagnina* (Fig. 2, 2). Also the spores of *G. jaapii* may seem to have a pore.

Cystidia. We have paid most attention to the features of the cheilocystidia. Other authors (e.g. SMITH & SINGER, 1964) have generally described pleurocystidia where such are present. In general the pleurocystidia are larger than the cheilocystidia, but of the same general shape. Also the caulocystidia, present at least at stipe apex in all the species, reflect the general shape of the cheilocystidia. This apparently is true also for the pileocystidia (Fig. 1, 1), although a different shape of the pileocystidia is found in *G. perplexa* (Fig. 1, 2).

Apparently the cystidia in most species become \pm yellow brown to amber with age from (dis)coloration of the walls or the plasmatic content. The same applies to basidia. We have not found this feature helpful in the discrimination or identification of taxa and it is hence often not included in the descriptions.

RESULTS AND DISCUSSION

Results. Eighteen species (19 taxa) of *Galerina* and one species of *Phaeogalera* (*P. stagnina*) are present in the material (forms not counted). *Galerina pumila* is represented by two varieties, var. *pumila* and var. *subalpina*. *Galerina atkinsoniana* and *G. vittiformis* have both 2- and 4-spored forms of their type varieties. Twelve taxa are reported for the first time in Iceland. Of these *G. perplexa* seems to be new also to Europe. Of the previously recorded *Galerina*/*Phaeogalera* species from Iceland nine are still recognised, while collections/descriptions referred to as *Galerina (Pholiota) unicolor* and *G. praticola* are recognised as *G. pseudomycesopsis*. *Galerina hypnorum* are excluded from the list of Icelandic species.

Judging from the number of collections, *G. pseudomycesopsis*, *G. clavata* and *G. vittiformis* are considered very common in Iceland; they have more than 50 collections each. Also *G. badipes*, *G. harrisonii*, *G. mniophila*, *G. pseudocerinia* and *G. terrestris* seem to be rather common as there are between 11 and 15 collections of each. There are five collections each of both *G. atkinsoniana* and *P. stagnina* while the remaining ten taxa have only 1-4 collections each, viz., *G. jaapii*, *G. lubrica*, *G.*

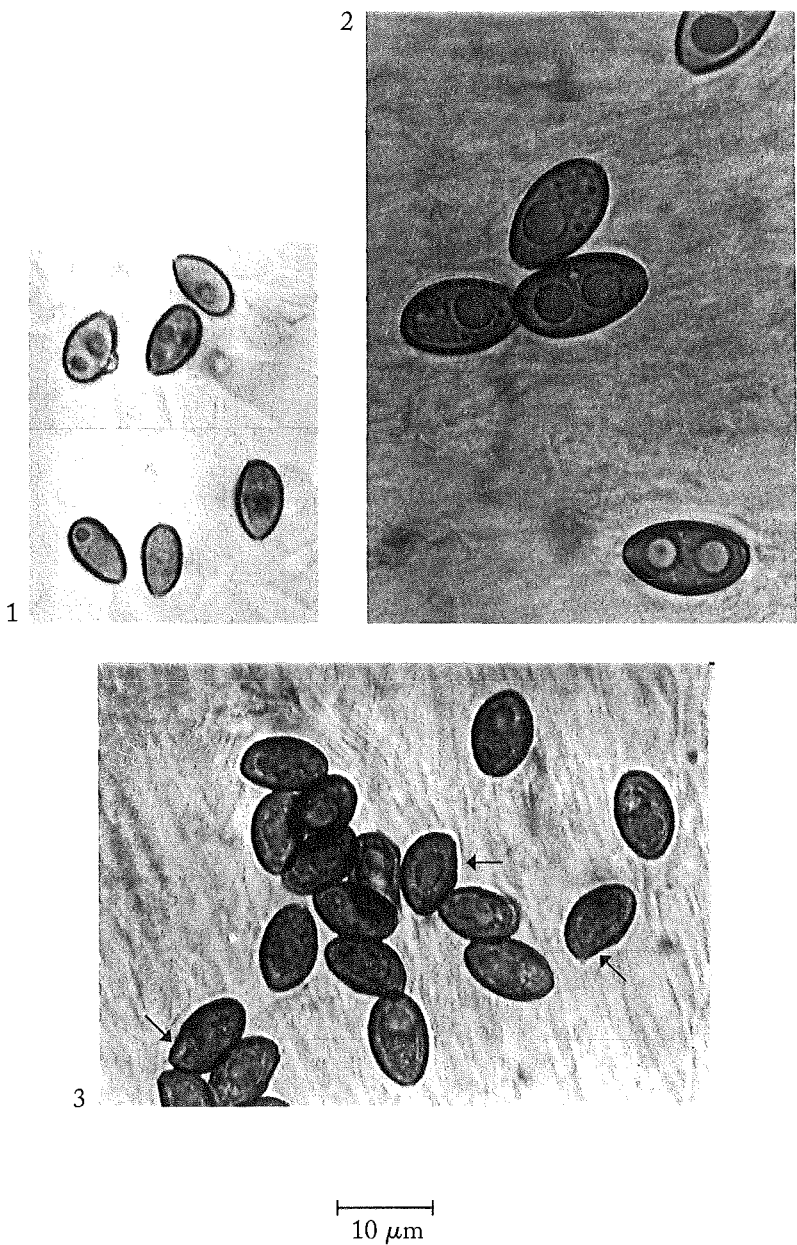


FIGURE 2. Micromorphology of *Galerina*. Spores. 2, 1. *Galerina stordalii* (GG 165/93), verruculose spores with apical pore; 2, 2. *Phaeogalera stagnina* (GG 100/93), smooth spores with apical pore; 2, 3. *G. marginata* (GG 139/93), verruculose spores with plague (arrows).

marginata, *G. permixta*, *G. perplexa*, *G. pumila* var. *pumila* and var. *subalpina*, *G. sphagnorum*, *G. stordalii* and *G. subclavata*.

Galerina species were shown to occur in almost every type of vegetation, except perhaps in the driest kind of grassland. Wet grasslands, various kinds of swamps and wetlands appear to be especially rich. The most frequent species found in such habitats were *G. clavata*, *G. pseudomycenopsis*, *G. vittiformis*. Also *P. stagnina* and the two *Sphagnum* confined species, *G. sphagnorum* and *G. stordalii*, occurred here although less abundantly. *Galerina terrestris* and *G. jaapii* were collected in pioneer vegetation such as along brooks and lavafields. The mountain heaths and snow-beds yielded a high number of species, viz., *G. harrisonii*, *G. lubrica*, *G. pseudocerina*, *G. pumila* and *G. subclavata*, but also the three almost ubiquitous species in Iceland, *G. clavata*, *G. pseudomycenopsis*, and *G. vittiformis*. *Galerina marginata*, *G. badipes*, *G. atkinsoniana*, *G. vittiformis* and *G. mniophila* typically occurred in forests, the former two were generally associated with wood or plant debris and the latter three often with *Polytrichum* and other larger forest bryophytes. The single finds of *G. perplexa* and *G. permixta* were made in spruce forest and in regularly flooded *Salix* scrubs, respectively.

Galerina pseudotundrae, that Kühner described from Europe in 1972, is shown to be conspecific with the North American *G. lubrica* A.H. Sm., described in 1964. *Galerina subclavata* Kühner is recorded as new to North America.

Discussion. The number of recognised *Galerina* and *Phaeogalera* taxa in Iceland (20) is about the same as in alpine Norway (23, GULDEN 1980) and the Faroes (18, GULDEN & VESTERHOLT 2000) and slightly higher than recorded from the arctic archipelago Svalbard (12, GULDEN 1987). Only six of the taxa are known in this whole 'North Atlantic Region', but additionally five occur in all the areas except the most arctic, Svalbard (Tab. 1). The bunch (*G. atkinsoniana*, *G. clavata*, *G. harrisonii*, *G. lubrica*, *G. marginata*, *G. mniophila*, *G. pseudocerina*, *G. pseudomycenopsis*, *G. stordalii*, *G. vittiformis* and *P. stagnina*) may be said to constitute the core of the North Atlantic *Galerina/Phaeogalera* mycota.

The differences found between the areas are probably due to a certain undersampling in one or more of the areas. Especially the rarer taxa may have escaped in some parts of the region. However, some of the listed taxa are critical or badly understood and, obviously, some of the difference may be due to important ecological parameters varying between the areas. Table 1 indicates that the Icelandic *Galerina/Phaeogalera* mycota most closely resembles that of the alpine site in Norway (Finse). The areas have 17 taxa in common while three taxa found in Iceland not yet have been found in the Finse area (viz., the rare species *G. perplexa*, *G. permixta* and the type variety of *G. pumila*). On the other hand Finse has six fairly common taxa (collected 7 - 11 times) that have not yet been found in Iceland, viz. *G. calyptrata*, *G. hypnorum*, *G. hypophaea*, *G. norvegica*, *G. paludosa* and *G. vittiformis* var. *pachyspora*. Of these especially *G. paludosa* and *G. calyptrata*, that are quite characteristic species of ombrotrophic *Sphagnum* bogs, may grow in Iceland. However, *G. paludosa* is a species that only occurs at low altitudes in the Faroes and it also seems to reach a climatic limit at Finse, occurring there only at

TABLE 1. Taxa of *Galerina* and *Phaeogalera* in northern regions (forms not specified). Information is from Gulden (1980, 1987) and Gulden & Vesterholt (2000). The numbers represent number of collections examined from each area.

Taxon	Iceland	Finse	The Faroes	Svalbard
<i>G. arctica</i>				79
<i>G. atkinsoniana</i> var. <i>atkinsoniana</i>	5	22	6	
<i>G. badipes</i>	11	6 ¹		
<i>G. calyptrata</i>		8	2	1
<i>G. cephalotricha</i>			1(cf.)	
<i>G. clavata</i>	66	23 ²	11	53
<i>G. embolus</i>				1 (cf.)
<i>G. harrisonii</i>	15	13 ³	1	1 ³
<i>G. hypnorum</i>		11		3
<i>G. hypophaea</i>		11		
<i>G. jaapii</i>	2	1		
<i>G. lubrica</i>	1	3 ⁴	4 ⁴	
<i>G. marginata</i>	4 ⁵	5 ⁵	10 ⁵	
<i>G. mniophila</i>	13	X ⁶	12	7
<i>G. norvegica</i>		7		
<i>G. paludosa</i>		9	8	
<i>G. permixta</i>	1			
<i>G. perplexa</i>	1			
<i>G. pseudocerina</i>	11	2	17	20
<i>G. pseudomniophila</i>		3	1(cf.)	2
<i>G. pseudomycenopsis</i>	90	20 ⁷	21	139
<i>G. pumila</i> var. <i>pumila</i>	5			1
<i>G. pumila</i> var. <i>subalpina</i>	1	1		
<i>G. stordalii</i>	4	5	2	
<i>G. sphagnorum</i>	1	2		
<i>G. subarctica</i>			1(cf.)	
<i>G. subclavata</i>	2	1		
<i>G. terrestris</i>	12	19		
<i>G. tibiicystis</i>			13	
<i>G. vittiformis</i> var. <i>vittiformis</i>	52	13	1	
<i>G. vittiformis</i> var. <i>pachyspora</i>		10		
<i>P. stagnina</i>	6	16	3	3
<i>P. subfusispora</i>			1	
Total no. of taxa (No. of taxa shared with Iceland)	20	24 (17)	18 (11)	12 (7)

¹ as *G. cedretorum* v. *bispora* and *G. acris*.
² as *G. heterocystis*.
³ as *G. anthelia*
⁴ as *G. pseudotundrae*.
⁵ *ss. lato*, inclusive of *G. praticola* and *G. unicolor*
⁶ unpublished
⁷ as *G. moelleri*

the lowest altitudes. It is a species with an early fruiting season. *Galerina hypnorum* has been recorded from Iceland, but is excluded from the present list pending better documentation. As for *G. hypophaea* and *G. norvegica*, they are little known taxa hard to recognise. The same may be held for var. *pachyspora* of *G. vittiformis*, recognised only on broader spores than in the type variety. They are actually in the range of 2-spored *G. atkinsoniana*. Considering this, and that the variety, originally described from the Southern Hemisphere, has not yet been recognised in other northern hemispheric regions, the identification seems doubtful.

Taxa rather common in the Faroes that not yet have been found in Iceland are *G. paludosa* (see above) and *G. tibiicystis*. The latter, again a typical bog species occurring at low altitudes in the Faroes, is absent also in the other areas studied. Probably it does not occur in Iceland. The other four species growing in the Faroes and not yet found in Iceland are rare and/or critical taxa represented by only one collection each in the Faroese material. The very common species in Svalbard, *G. arctica* – a species closely related to *G. clavata* – has not yet been found in any of the other areas and might be a high-arctic species not liable to occur in Iceland. Finally, *G. pseudomniophila*, collected a few times in all the other regions, might be expected in Iceland.

The material does not readily lend itself to mycogeographical reflections on a national scale. For this too many districts are undersampled. However, it is documented that the three really common *Galerina* species in Iceland, *G. clavata*, *G. pseudomycesopsis* and *G. vittiformis*, grow in all parts of the island (Fig. 10). A number of the other species are also known from most parts of Iceland and further collecting in the less investigated parts will probably yield finds. N and NE Iceland are by far the best collected parts and here most of the species have been found. Only *G. pumila* (both varieties) and *G. perplexa* have, so far, not been found in the north/northeast.

Most of the taxa occur in the lowlands. Only two have not been found in lowland sites and may prefer colder conditions, viz. *G. harrisonii* and *G. subclavata*. Both are known from alpine sites in Norway and the former also occurs on Svalbard and at high altitude in the Faroes (GULDEN 1980, 1987 and GULDEN & VESTERHOLT 2000). Six more taxa have been collected at high altitudes (5–600 m) in Iceland (*G. clavata*, *G. mniophila*, *G. pseudocerina*, *G. pseudomycesopsis*, *G. terrestris* and *G. vittiformis* var. *vittiformis*). *Galerina pseudomycesopsis* was the one found at the highest altitude, 800 m, and this was the case also in the Faroes.

The *Galerina/Phaeogalera* mycota of Iceland comprises a mixture of taxa belonging to the temperate-boreal mycotas and to the arctic-alpine mycota. Of the Icelandic *Galerina/Phaeogalera* taxa the following seem to prefer cold climate regions: *G. harrisonii*, *G. lubrica*, *G. pseudocerina*, *G. pseudomycesopsis*, *G. subclavata* and *G. terrestris*, possibly also *P. stagnina*. On the other hand, *G. atkinsoniana*, *G. badipes*, *G. clavata*, *G. jaapii*, *G. marginata*, *G. mniophila*, *G. pumila*, *G. sphagnorum*, *G. stordalii* and *G. vittiformis* comprise a typical boreal-temperate group of species.

All of the Icelandic *Galerinas* also grow in North America. Several are known from Asia as well and probably have a circumpolar distribution. Some, like *G. atkinsoniana*, *G. clavata*, *G. pseudomycesopsis*, *G. vittiformis* and *P. stagnina* are recorded also from the Southern Hemisphere (SMITH & SINGER 1964, HORAK 1993).

SYNOPSIS OF RECOGNISED TAXA

Genus *GALERINA* Earle

Subgenus *Tubariopsis* (Kühner ex Bas) A. H. Sm. & Singer emend. Gulden

Section *Tubariopsis*

1. *G. clavata* (Velen.) Kühner
2. *G. subclavata* Kühner

Section *Hemitubariopsis* Kühner ex Gulden

3. *G. stordalii* A. H. Sm.

Section *Tibiicystis* (A. H. Sm. & Singer) Gulden

4. *G. pseudocerina* A. H. Sm. & Singer

Subgenus *Naucoriopsis* Kühner ex Gulden

Section *Naucoriopsis*

5. *G. marginata* (Batsch) Kühner ss. *lato*
6. *G. pseudomycesopsis* Pilát
7. *G. badipes* (Fr.) Kühner

Subgenus *Galerina*

Section *Galerina*

- 8a. *G. atkinsoniana* A. H. Sm. var. *atkinsoniana* f. *atkinsoniana*
- 8b. *G. atkinsoniana* var. *atkinsoniana* f. *quadrispora* Gulden f. nov.
9. *G. perplexa* A. H. Sm.
- 10a. *G. vittiformis* (Fr.) Singer var. *vittiformis* f. *vittiformis*
- 10b. *G. vittiformis* (Fr.) Singer var. *vittiformis* f. *tetraspora* A.H.Sm.& Singer
11. *G. terrestris* V. L. Wells & Kempton

Section *Mycenopsis* A. H. Sm. & Singer

12. *G. jaapii* A. H. Sm. & Singer
13. *G. lubrica* A. H. Sm.
14. *G. harrisonii* (Dennis) Bas & Vellinga
15. *G. mniophila* (Lasch) Kühner
- 16a. *G. pumila* (Pers. : Fr.) M. Lange non ss. M. Lange var. *pumila*
- 16b. *G. pumila* (Pers. : Fr.) M. Lange var. *subalpina* A.H. Sm.
17. *G. permixta* (P. D. Orton) Pegler & T.W.K. Young
18. *G. sphagnorum* (Pers. : Fr.) Kühner

Genus *PHAEOGALERA* Kühner

19. *P. stagnina* (Fr.) Kühner ex Pegler & T. W. K. Young

KEY TO THE SPECIES OF GALERINA AND PHAEOGALERA ON ICELAND

1. Cystidia tibiiform (Subgen. *Tubariopsis*) 2
1. Cystidia not tibiiform 5
 2. Basidia 2-spored 2. *G. subclavata*
 2. Basidia 4-spored 3
3. Clamp connections numerous in all tissues, spores broadly ellipsoid to subglobose, coarsely ornamented 4. *G. pseudocerina*
3. Clamp connections absent or present only at some few septa 4
 4. Spores 11-17 x 6-10 μm , clamp connections absent 1. *G. clavata*
 4. Spores 7-11 x 4.5-6 μm , clamp connections at some few septa 3. *G. stordalii*
5. Pleurocystidia present, ventricose-fusoid to ventricose-subcapitate like the cheilocystidia 6
5. Pleurocystidia absent, cheilocystidia variously shaped (Section *Mycenopsis*) 12
 6. Stipe pruinose \pm over the entire length, 0.5-2.5 mm thick, \pm fulvous-redbrown from base and upward, cap membranous and with straight margin; caulocystidia present even at stipe base (Section *Galerina*) 7
 6. Stipe pruinose only at apex, generally > 3 mm thick and with a ring or a ring zone, beige and darkening to grey brown from base, cap somewhat fleshy and at least young with incurved margin; caulocystidia only near apex (Subgen. *Naucoriopsis*) 10
7. Veil present, basidia 4-spored 11. *G. terrestris*
7. Veil absent, basidia 2- or 4-spored 8
 8. Pileocystidia present 9
 8. Pileocystidia absent, basidia 2- or 4-spored 10 *G. vittiformis*
9. Pileocystidia ventricose like the hymenial cystidia, basidia 2- or 4-spored 8. *G. atkinsoniana*
9. Pileocystidia narrow, setae-like, basidia 4-spored, most spores less than 10mm long 9. *G. perplexa*
10. Ring or ring zone generally present (may be lost or very evanescent), basidia 4-spored 11
10. Veil not leaving a ring but generally a ring zone, basidia 2-spored 7. *G. badipes*
11. Spores 6.5-8 μm broad (av. = 7.2 μm), almost smooth with a tiny pore; mainly growing among moss and grass in moist habitats, never on wood 6. *G. pseudomycenopsis*

11. Spores 5.5–6.5 μm broad (av. = 5.9 μm), distinctly rugulose and with perispore that loosens \pm along the entire periphery of the spores, among grass or on wood 5. *G. marginata*
- 12(5). Basidia 2-spored, narrowly amygdaliform 13
12. Basidia 4-spored 14
13. Stipe with ring, spores rugulose, cystidia ventricose-capitate 12. *G. jaapii*
13. Without ring, spores smooth, cystidia capitate with narrow ventral inflation 13. *G. lubrica*
14. On *Sphagnum*; spores smooth or practically smooth 15
14. Generally not on *Sphagnum* 16
15. Veil substantial, often leaving an annulate zone and/or rests on the cap margin; spores ellipsoid with distinct pore, plage absent 19. *Phaeogalera stagnina*
15. Veil evanescent; spores amygdaliform, without apical pore/callus, plage present 18. *G. sphagnorum*
16. Cystidia with distinct ventral inflation, apically inflated or not 17
16. Cystidia \pm flexuous and cylindric, occasionally capitate, without or with small ventral inflation 18
17. Cystidia capitate, spores broad (7–10 μm , av. 8.5 μm), tawny, veil often copious, sometimes forming an annulate zone 14. *G. harrisonii*
17. Cystidia ventricose-cylindric (lageniform) only occasionally with small apical inflations, spores (6–8 μm broad, av. 7.0 μm), yellow brown, veil rudimentary 15. *G. mniophila*
18. Spores truly smooth, \pm ellipsoid (blunt apex), without plage, fulvous to tawny 19
18. Spores minutely marbled/rugulose, amygdaliform (acute apex), plage present but inconspicuous (seen as a pale, not-marbled spot in face view or as a minute hump above the suprahilar appanation in profile view – and often visible only in a few spores), yellow to yellow brown 20
19. Spores with distinct pore, fruitbody red brown 19. *Phaeogalera stagnina*
19. Pore/callus absent, fruitbody pale ochre 16a. *G. pumila* var. *pumila*
20. Cystidia \pm capitate, spores narrowly amygdaliform (5.5–6.5 μm broad, av. 6.1 μm), fruitbody brown 17. *G. permixta*
20. Cystidia not or only little apically inflated, spores amygdaliform (6.8–7.7 μm broad, av. 7.1 μm), fruitbody pale ochre 16b. *G. pumila* var. *subalpina*

Genus *GALERINA* Earle

Subgenus *Tubariopsis* (Kühner ex Bas) A. H. Sm. & Singer emend. Gulden

Macroscopically the species of subgenus *Tubariopsis* are rather similar to those of subgenus *Galerina*. They are small, thin-fleshed and slender. Those found in Iceland have all rather brightly coloured, somewhat fatty-shiny caps and pale stipes, generally paler than the cap. Microscopically members of the subgenus are distinguished by having tibiiform cystidia and none or poorly developed plage on the spores.

Section *Tubariopsis*

Clamps absent. Spores not dextrinoid.

1. *Galerina clavata* (Velen.) Kühner – Fig. 3, 1 and Fig. 10

Synonym: *G. heterocystis* (Atk.) A.H. Sm. & Singer ss. Smith & Singer 1964, Gulden 1980.

Material examined: Árnessýsla (4). Borgarfjarðarsýsla (3). Mýrasýsla (2). Snæfellsnes- og Hnappadalssýsla (1). Dalasýsla (1). Vestur-Barðastrandasýsla (1). Vestur-Ísafjarðarsýsla (1). Norður-Ísafjarðarsýsla (1). Vestur-Húnavatnssýsla (1). Austur-Húnavatnssýsla (1). Skagafjarðarsýsla (1). Eyjafjarðarsýsla (14). Suður-Pingeyjarsýsla (3). Norður-Múlasýsla (19). Suður-Múlasýsla (8) Central Highland (5).

Distinction: The species can generally be recognised in the field on a fatty shiny and rather brightly coloured cap and a pale stipe with \pm white fibrils. Microscopically the combination of tibiiform cystidia, large, verrucose spores without plage, and the absence of clamp connections define the species.

Gross-morphology: Cap 0.5–2.3 cm, conic to convex, occasionally umbonate, membranous, but flesh up to 1.5 mm thick at apex, striate to the disc, fatty to shiny, hygrophanous, moist brightly yellow, ochre, yellow brownish to red brownish (e3, l 4, k3,5, h3), drying to yellowish (k4, b6,7). Gills ascending-adnate, subdistant, ventricose, yellow, ochre to yellow brown (e3, k3), concolorous with cap or slightly more brown. Stipe 3–8 cm high, 1–2 mm thick, up to 3 mm at base, towards base slightly thicker to bulbous, apex minutely white pruinose, downwards \pm silky fibrillose, pale yellowish beige, honey-coloured, pale yellow brown, distinctly paler than cap. Veil generally seen as fibrils on the stipe. Smell and taste indistinct.

Microscopic characters: Basidia 27.5–50 \times 7.5–15 μ m, 4-(2)-spored, basidiols narrow in apical part, mature basidia \pm constricted. Spores 11–17 \times 6–10 μ m, A_v (140/14) = 13.0 \times 7.6 μ m, Q = 1.5–2.0, Q_{av} (140) = 1.7, in front view ovoid, ellipsoid or amygdaliform, in profile strongly inequilateral, applanated to slightly depressed at the plage area, outline attenuated towards apex and broadest part below the middle, tawny in KOH, verruculose, no plage, no pore/callus, not dextrinoid. Cheilocystidia rendering edge sterile, 25–57(–87.5) \times 5–17.5(–35) \times 2–5 μ m.

2–12 μm , tibiiform, occasionally proliferating, branched, bent, septate, some considerably inflated and \pm globose with pedicelle and then up to 35 μm wide occasionally present; pleurocystidia seen in some specimens. Pileocystidia absent. Caulocystidia similar to cheilocystidia, larger, numerous at stipe apex, present over the entire length. Clamp connections absent.

Habitats: In mires and wetlands, often near small lakes or ponds and along creeks and springs, among mosses of genera such as *Philonotis*, *Calliergon*, *Mnium* and *Sphagnum*. Also among grass, for example in lawns, also on seashores, sand dunes and fields. Found also in forests, in moist mountain heaths, and in *Betula nana* and *Dryas* heaths. In general it seems to prefer moist and wet habitats. Collected from sea level up to 650 m altitude on Iceland.

Distribution: The species is common and widespread in Iceland. In the Northern Hemisphere it is known from temperate regions to the Arctic and from lowland habitats up in the alpine zone (cf. GULDEN 1980, GULDEN & VESTERHOLT 2000). It is also recorded from subtropical regions and occurs at least as far south as to Patagonia in the Southern Hemisphere (SMITH & SINGER 1964).

Comments: Following SMITH & SINGER (1964) *G. clavata* (Velen.) Kühner and *G. heterocystis* (Atk.) A. H. Smith & Singer are conspecific. However, their description and illustration of the type of *G. heterocystis*, with weakly ornamented to almost smooth spores and subacute to subcapitate cystidia, strongly suggests that this is another taxon. HORAK (1993) concludes the same after re-examination of the type material.

Galerina clavata is generally seen without pleurocystidia, but SMITH & SINGER (*loc. cit.*) report occasional presence of pleurocystidia 'mostly near the gill edge'. In our collections with pleurocystidia (coll. nos. GG 106/93, 118/93, 211/93, HH 5230, 13018) they occurred patchily on the gill sides, not exclusively near the edge. We could not find other characters in this material suggesting a distinct taxon. Pleurocystidia in subgenus *Tubariopsis* represent a deviation from the normal pattern.

At least eight finds in Iceland were made on *Sphagnum*, which do not seem to be a rare substratum for the species here. From other areas *G. clavata* has been reported as rarely growing on *Sphagnum* (SMITH & SINGER 1964, GULDEN 1980, WATLING et GREGORY 1993). *Galerina clavata* has previously been recorded from Iceland, occurring in wetlands in the whole country HALLGRÍMSSON (1993).

2. *Galerina subclavata* Kühner – Fig. 3, 2

Material examined: Eyjafjarðarsýsla: Hlíðarfjall, Akureyri at the ski hut, 500–550 m alt., in *Salix herbacea* snow-bed, 14 Aug. 1985, HH 9808 (AMNH); on moss, in moist site with *Sphagnum*, 1 Aug. 1993, GG 56/93 (O).

Distinction: The fatty-shiny cap, distant gills, and the pale stipe might be good field characters for this species. Apparently the species is browner than its closest relative, *G. clavata*. Microscopically the large, rather pale, almost smooth spores without plage, born on 2-spored basidia, are distinctive.

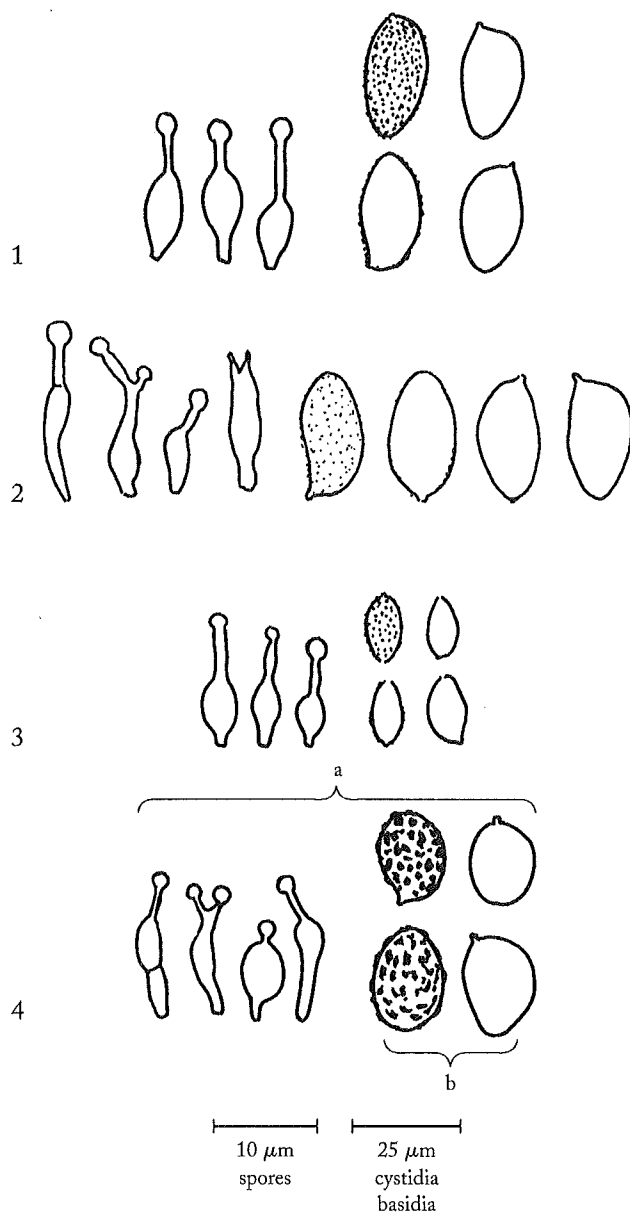


FIGURE 3. Spores, basidium and cheilocystidia. 3, 1. *Galerina clavata* GG 55/93; 3, 2 *G. subclavata* HH 9808; 3, 3 *G. stordalii* GG 165/93; 3, 4 *G. pseudocerina*, a GG 204/93, b GG 210/93.

Gross-morphology: Cap up to ca 1 cm wide, conic to conic-umbonate, up to 1 mm thick at apex, translucently striate to disc, fatty-shiny, hygrophanous, moist ochre to yellow brown (k4, b6, e3, e6, g1-2). Gills ascending-adnexed, distant, first yellow then ochre to yellow brown (e3, b5, k5), becoming darker than the cap. Stipe up to 5 cm tall, 1-1.5 mm thick, pale beige (b7), paler than cap, apex white pruinose. Smell/taste indistinct. Veil, if present, evanescent.

Microscopic characters: Basidia 2-spored, $32.5\text{--}47.5 \times 7.5\text{--}11.3 \mu\text{m}$, occasionally 4- or 1-spored, narrow at apex; basidiols narrow in apical part. Spores $12\text{--}17 \times 6.5\text{--}8 \mu\text{m}$, $Av(20/2) = 14.5 \times 8.0 \mu\text{m}$, $Q = 1.4\text{--}2.4$, $Q_{av}(20) = 1.9$, ellipsoid to narrowly amygdaliform in face view, somewhat inequilateral in profile and with applanation-depression in the plage area, broadest approximately in the middle, pale yellow brown in KOH, finely verruculose, plage absent, pore/callus absent, not dextrinoid. Cheilocystidia rendering edge sterile, $30\text{--}62 \times 5\text{--}8.8 \times 1\text{--}4.5 \times 1\text{--}9.5 \mu\text{m}$, tibiiform, occasionally branched or without head. Caulocystidia dense at stipe apex, also present at stipe base, similar to the cheilocystidia. Pileipellis with an upper layer of narrow, $3\text{--}6 \mu\text{m}$ wide, long-celled hyphae grading into inflated and short-celled hyphae, up to $30 \mu\text{m}$ wide, all yellow brown zebra-incrusted; pileocystidia present, rather few, narrowly tibiiform. Clamp connections absent.

Habitats: Gregarious in *Salix herbacea* snow-bed, in moist moss, also *Sphagnum*, but not on *Sphagnum*.

Distribution: So far the species has only been recorded from northwestern Europe and from high-elevation sites in central Europe (HORAK 1993, WATLING & GREGORY 1993). However, the species was found in the Cascades of Washington, at the timberline at Cloudy pass in autumn 1997 (GG, unpublished record). Also the North American 2-spored material of *G. heterocystis* discussed by SMITH & SINGER (1964) may well belong in *G. subclavata*.

Comment: Previously recorded from Iceland by HALLGRÍMSSON (1993) and by chance found by GG in the same place in 1993, and only there.

Section *Hemitubariopsis* Kühner ex Gulden

Clamps absent or present only at few septa, spores not dextrinoid.

3. *Galerina stordalii* A. H. Sm. – Fig. 3, 3 and Fig. 2, 1

Synonyms: *G. propinqua* Bas 1965, *G. frigida* V. L. Wells & Kempton 1969, *G. dimorphocystis* A. H. Sm. & Singer ss. Kühner 1972, Nezdajminogo 1985.

Material examined: Eyjafjardarsýsla: Kleif, Þorvaldsdal, near small spring, in *Sphagnum*, 100-200 m alt., 5 Aug. 1983, HH 13736 (AMNH). Norður-Múlasýsla: Hjaltastaður, moist site with small ponds surrounded by *Sphagnum*, 5 Aug. 1993, GG 165/93, 166/93, 169/93 and 171/93 (O).

Distinction: The small size for a *Sphagnum*-inhabiting *Galerina* and the whitish, entirely pruinose stipe distinguish the species in the field. Microscopically the

spores, with pore and without plage and the scattered clamp connections are distinctive.

Gross-morphology: Cap 0.5–1.4 cm, convex, fatty shiny, margin slightly longer than the gills, striate about half way to centre, hygrophanous, moist bright ochre (b6), more yellow towards margin. Gills adnexed to adnate with small tooth, ventricose and broadest near margin, yellow (k4). Stipe ca 1–2 cm high and 1 mm thick, pruinose over entire length, white to pale yellow.

Microscopic characters: Basidia 4-spored, small, 20–27.5 x 7–9 μm . Spores 7–11 x 4.5–6(–6.5) μm , $Av(20/2) = 8.8 \times 5.5 \mu\text{m}$, $Q = 1.4\text{--}2.0$, $Q_{av}(20) = 1.6$, amygdali-form or upper part gradually attenuated towards a \pm truncate apex, with applanation to depression in the plage area, tawny in KOH, verruculose, plage absent, pore distinct, not dextrinoid. Cheilocystidia rendering edge sterile, 25–42.5 x 5–17.5 x 1.8–4 x 2–10 μm , tibiiform, occasionally forked or with two necks, occasionally without neck and then vesiculose; pleurocystidia absent. Caulocystidia numerous over the entire length, tibiiform or without ventral inflation. Pileipellis of radial, narrow, short-celled, yellow incrusting hyphae; pileocystidia not found. Clamp connections present in hymenial hyphae, at base of basidia, and at base of cystidia, but not at all septa.

Habitats: Apparently confined to *Sphagnum* and growing on moss and on peat in bogs; fruits early in the season (GULDEN 1980, WATLING & GREGORY 1993).

Distribution: Collections are from northern and eastern Iceland. The species is known from temperate to alpine sites in Europe, Siberia and North America (HORAK 1993, WATLING & GREGORY 1993, GULDEN & VESTERHOLT (2000).

Comments: New to Iceland.

Section *Tibiicystis* (A. H. Sm. & Singer) Gulden

Clamps present, spores dextrinoid.

4. *Galerina pseudocerina* A. H. Sm. & Singer – Fig. 3, 4

Material examined: Vestur-Húnavatnssýsla: Almenningur, Vatnsnesi, wetlands, in moist moss, 0–100 m alt. 2 Sept. 1984, HH 9534 (AMNH). Eyjafjarðarsýsla: Brúarland, Eyjafjarðarsveit, moist slope, in low moss, 40–50 m alt., 31 Aug. 1985, HH 9705 (AMNH); Akureyri, 35 m alt., on cliff with thin soil with cloves and willows, near burnt site, 16 and 24 Aug. 1993, leg. G. G. Eyjólfsson, HH 13530, 13531 (AMNH); Hlíðarfjall, Akureyri at ski lift, 500–550 m alt., moist, on *Racomitrium*, *Drepanocladus* and other mosses, 1 Aug. 1993, GG 50/93, 52/93 (O). Norður-Múlasýsla: Hrafnsgærði, Fellum, 150 m alt., in somewhat wet land, in moss, 30 Aug. 1985, HH 10059 (AMNH); Droplaugarstaðir, Fljótsdal, 50–80 m alt., in moss, 12 Sept. 1985, HH 10204 (AMNH); Hengifossárgil, *Dryas*-heath, 50–250 m alt., 6 Aug. 1993, GG 204/93 (O); Fljótsdalsheiði, near Hamborg, moist fell-field, among short mosses, ca 400 m alt., 6 Aug. 1993, GG 210/93 (O). Suður-Múlasýsla: Fénaðarklöpp, Egilsstöðum, 40

m alt., in moss on wet cliff, open vegetation, 24 Sept. 1987 HH 11611 (AMNH).

Distinction: The mostly convex and somewhat thick-fleshed, not or only faintly striate cap, the generally pale stipe and the farinaceous taste characterize the species. Microscopically the coarsely ornamented spores combined with tibiiform cystidia and clamp connections are distinctive.

Gross-morphology: Cap 0.7–2.5 cm, relatively fleshy, young with inbent margin, hemispheric to convex, occasionally conic or umbonate, not or faintly striate up to half way to apex, matt to somewhat fatty, hygrophanous, moist brightly red brown, orange brown to yellow brown (h1, g1, g8, e4, k5, e3), drying from centre to pale yellow brown, ochre (k5, e3). Gills \pm adnate or adnate-sinuate, subdistant, \pm horizontal and broad, pale beige, yellow brown, red brown (g1,2,7, e3, h3) with pale edge. Stipe 1.5–4 cm tall, 1–2.5 mm thick, apex minutely pruinose, below \pm white fibrillose, mostly paler than cap, apical part whitish to pale beige, gradually darker downwards and there yellow brown to red brown (k4, e6, e3, g1). Veil between cap and stipe in young specimens, white. Flesh brown in cap (moist), drying to pale yellow, yellow brown; taste and smell (faintly) farinaceous.

Microscopic characters: Basidia 4-spored, 27.5–47.5 \times 8–15 μ m, clavate and relatively large. Spores 9–15 \times 6–9.5 μ m, $Av(50/5) = 14.7 \times 8.0 \mu$ m, $Q = 1.3$ –1.8, $Q_{av}(50) = 1.5$, varying from broadly ellipsoid, ovoid, amygdaliform to almost subglobose, mostly without applanation or depression in the plage area, coarsely ornamented or appearing crusted and \pm cracked, deep tawny to rusty brown in KOH, plage absent or occasionally present and then very small, apical callus occasionally seen, dextrinoid. Cheilocystidia numerous but not rendering edge fully sterile, 20–65 \times 5–12 \times 1–2.5 \times 2.5–5 μ m, tibiiform, occasionally proliferating, forked or with two necks, rather slender. Pileipellis of radial, rather long-celled and somewhat inflated hyphae, up to 25 μ m wide, heavily yellow brown incrustated; pileocystidia absent. Caulocystidia numerous at apex, often without ventral inflation and then \pm pin-needle shaped. Clamp connections numerous in all tissues.

Habitats: In moist moss, on rocky outcrops with shallow soils, also in snow-beds with willows and among *Dryas*, growing with small mosses and often with *Racomitrium*. Apparently confined to basic soils; occurring in lowland sites and up to at least 500 m in Iceland.

Distribution: Collections are from northern and northeastern Iceland. Otherwise known from northern and/or high-elevation sites in Europe, Siberia and North America (HORAK 1993, WATLING & GREGORY 1993, GULDEN & VESTERHOLT 2000).

Comments: The spores are rather variable in size and shape as seen from a Q range between 1.2–1.9. They can vary considerably within a single mount, although there possibly might be a majority for either bluntly/broadly ellipsoid or more amygdaliform ones in different specimens (for instance, $Q_{av} GG204/93 =$

1.3, Q_{av} GG50/93 = 1.7, cf. Fig. 3, 4 a & b). We have, however, not found evidence for presence of two taxa with distinct spore features as proposed by HORAK & MILLER (1992) and further discussed by GULDEN & VESTERHOLT (1999).

New to Iceland.

Subgenus *Naucoriopsis* Kühner ex Gulden

Syn.: Section *Naucoriopsis* Kühner

The species of subgenus *Naucoriopsis* are larger and fleshier than most *Galerina* species and the young cap margin is \pm incurved and connected to the stipe by a \pm membranaceous veil. In many species the veil leaves a ring on the stipe, mostly combined with \pm conspicuous, appressed veil remnants over lower part of the stipe. Some have only a reduced annulate zone or have veil remnants only as a thin sheathing or fibrils in the lower part of the stipe. The cap surface is to a various degree coated with gelatinous hyphae and appears \pm viscid. Microscopically the species are quite similar to those of subgenus *Galerina*, with large, ventricose cheilo- and pleurocystidia. Spores dextrinoid.

5. *Galerina marginata* (Batsch) Kühner *ss. lato* – Fig.4, 5 and Fig.2, 3

Material examined: Gullbringusýsla: Baldurshagi at Rauðavatn, on pine stick, 80-120 m alt., 1 Sept. 1959, ML 697 (AMNH). Eyjafjarðarsýsla: Garðsárreitur, Eyjafjarðarsveit, on rotting stump of *Betula*, 150-160 m alt., 6 Aug. 1985, HH 9749 (AMNH). Suður-Múlasýsla: Hallormsstaður, in arboretum, on old grass remains, 4 Aug. 1993, GG 139/93 (O) and Mörkin, in forest path, on chips of wood, 30-50 m alt., 9 Sept. 1997, HH 25-97 (AMNH).

Distinction: A relatively large, fleshy *Galerina* with ring, often growing on rotting wood. The spores are smaller than in the other species of the subgenus known to grow in Iceland.

Gross-morphology: Cap 1-4 cm, conic, \pm umbonate or even papillate, becoming convex to plane, sometimes also slightly depressed, moist \pm sticky to viscid, hygrophanous, moist dark red brown to grey brown (h1, g1), drying to yellow brown (e6, g3, k4,5), margin remaining moist and dark and striate for a long time. Gills adnate with small tooth to slightly decurrent, moderately close, at first pale brown to yellow brown, later more red brown (g1,2,7, h3, j1). Stipe 2-6 cm tall, 2-5 mm thick, equal to slightly thicker downwards, fistulose, pruinose at apex, \pm white fibrillose below a ring, apex pale brown, otherwise greyish brown, becoming dark brown in lower part with age, base \pm white tomentose; ring at first open upwards, later hanging. Flesh pale brown (c8) in cap, dark brown (f6,8, h1) in stipe. Smell somewhat farinaceous, taste mild.

Microscopic characters: Basidia 4-spored, 22.5-32 x 7.5-8 μ m, constricted. Spores (8.5-)9-10.5 x 5.5-6.5 μ m, $Av(40/4) = 9.7 \times 5.9 \mu$ m, $Q = 1.5-1.8$, $Q_{av}(30) = 1.6$, amygdaliform to ellipsoid, rugulose-verruculose, yellow brown in KOH, with distinct, smooth and pale plage, callus present, perispore loosening \pm around the whole spore or forming small blisters mostly in the plage area, dextrinoid Cheilocystidia

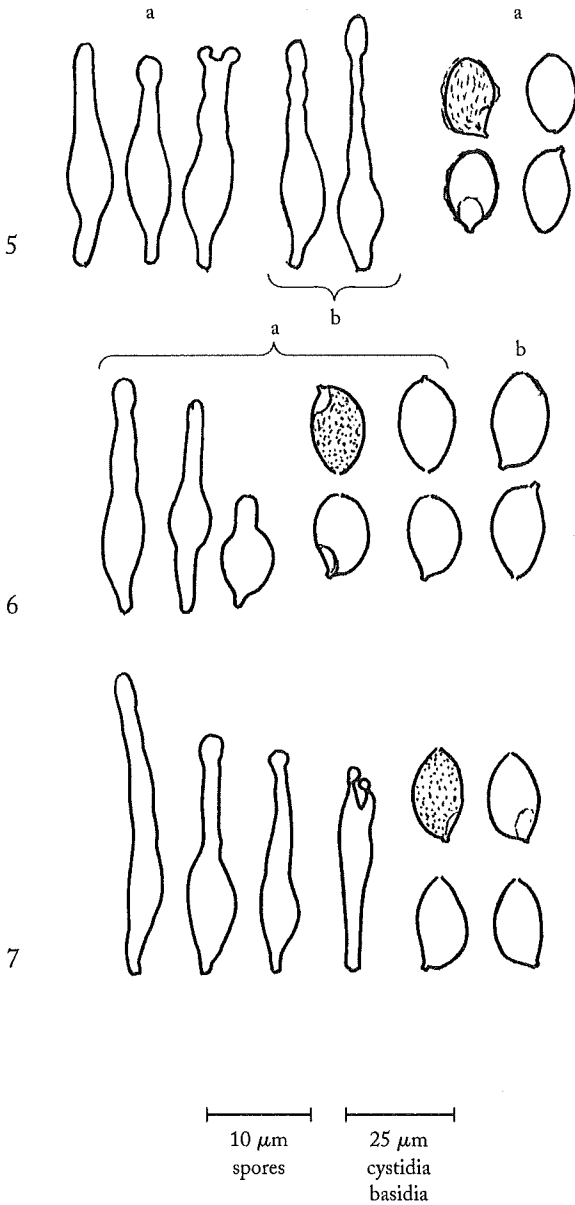


FIGURE 4. Spores, basidium and cheilocystidia. 4, 5. *Galerina marginata*, a and c GG 139/93, b HH 9749; 4, 6 *G. pseudomycesopsis*, a GG 101/93, b HH 11253; 4, 7. *G. badipes* GG 128/93;

rendering the edge sterile, $40\text{--}65 \times 9\text{--}14.5 \times 3\text{--}5 \times 3\text{--}7 \mu\text{m}$, ventricose- (sub)capitate, head often ellipsoid to spearhead-shaped, rarely tip not inflated; pleurocystidia scattered, often few, similar. Pileipellis with an upper layer of narrow, \pm curled hyphae in a gelatinous matrix. Caulocystidia rather few, similar to the cheilocystidia. Clamp connections numerous in all tissues.

Habitats: On rotting wood of *Betula* and *Pinus*, on sticks and woody chips, and in old grass; caespitose to gregarious.

Distribution: Collections are from south and north Iceland. This is probably a circumglobal species occurring from temperate to alpine regions.

Comments: We have included material growing on wood and material with no apparent connection to wood in our concept of *G. marginata*. The similar *G. pseudomycenopsis*, which is very common in Iceland, is always terrestrial. They differ microscopically in spore characters. *Galerina marginata* has relatively small spores, mostly no longer than 10 μm and rarely more than 6 μm wide, with a distinctly loosening perispore. The spores of *G. pseudomycenopsis* are larger, smoother and darker, without or with only very slight perispore loosening. Apparently there is a difference also in the apical part of the spore: *G. marginata* seems to have a callus, that often is indistinct, while a pore is quite evident in *G. pseudomycenopsis*. The spore wall as seen in Melzer's in *G. marginata* appears hyaline, while in *G. pseudomycenopsis* it appears thicker and coloured. *G. marginata* belongs to a problematic taxonomic complex where several issues remain to be solved towards taxa/names such as *G. praticola*, *G. unicolor* and *G. autumnalis*. This problem is presently addressed by the senior author within another context and hence not discussed further here.

Two collections, both from Hallormsstað (GG 139/93 and HH 25-97), had many cystidia with two small outgrowths at apex that finally made the cystidia appear forked and particular (Fig. 4, 5 a). SMITH & SINGER (1964: 270) report on corresponding cystidia in *G. marginata*, *G. patagonica* and *G. helvoliceps*.

LARSEN (1932), CHRISTIANSEN (1941) and HALLGRÍMSSON (1989, 1993) have recorded *G. (Pholiota) marginata* from SW, N and E Iceland. The material collected by Larsen and later cited by Christiansen had according to the authors partly fairly large spores ($10\text{--}10.5\text{--}12 \times 6\text{--}6.5 \mu\text{m}$) and had been collected in peaty, damp soils in bogs and in river valleys. Very probably this belongs in *G. pseudomycenopsis* as proposed by LANGE (1957, sub *G. pumila*).

The generally smaller *G. badipes* can, like *G. marginata*, grow on woody substrate, but more often on duff or other plant remains on the ground. This species differs clearly from *G. marginata* by lacking a ring and having 2-spored basidia.

6. *Galerina pseudomycenopsis* Pilát – Fig. 4, 6 and Fig. 10

Synonyms: *Galerina moelleri* Bas 1960, *Pholiota pumila* (Pers. : Fr.) Gill. ss. Møller (1945), *Galerina pumila* (Pers. : Fr.) M. Lange ex Singer ss. M. Lange 1957, *G. pumila* f. *oreina* J. Favre 1955, *G. pseudopumila* P. D. Orton 1960.

Material examined: Rangárvallasýsla: (1). Árnessýsla: (9). Gullbringusýsla (1). Borgarfjarðarsýsla (2). Dalasýsla (1). Vestur-Barðastrandasýsla (6). Vestur-Ísafjarðarsýsla (2). Norður-Ísafjarðarsýsla (1). Strandasýsla (1). Vestur-Húnavatns-sýsla (1). Skagafjarðarsýsla (3). Eyjafjarðarsýsla (10). Suður-Píngeyjarsýsla (11). Norður-Múlasýsla (25). Suður-Múlasýsla (6). Múl. (2). Central Highland (10).

Distinction: The typical *G. pseudomycenopsis* is a relatively large and fleshy *Galerina* with a convex to slightly depressed, fatty-viscid cap, a ring on the stipe, and a terrestrial habit in moist, mossy or grassy sites. The gills are ochre to yellow brown, well in contrast with the orange brown to red brown cap. However, sometimes the fruitbodies are small and slender, or otherwise untypical, for example by a cap that is rather acutely umbonate or a stipe that lacks a ring. Microscopically the deeply coloured, relatively large, almost smooth spores with a distinct pore distinguish it from related species.

Gross-morphology: Cap 0.5–4 (–5.5) cm broad, at first hemispheric or umbonate, becoming plano-convex to somewhat depressed, margin incurved/downbent for a rather long time and sometimes with veil remnants, \pm translucently striate at margin, fatty-subviscid, hygrophanous, moist dark red brown to dark yellow brown, more yellow brown at margin (c1,2,3,4, d1, g1,8, h1,2, j4,5, k5, 8), drying from centre, or often from a zone between margin and centre, to paler red brown, yellow brown, pale brown (b6, g1,2,7, e3, k4,5). Gills adnate to decurrent with small tooth, subdistant, young pale yellow brown or ochre (k4), then more greyish brown to cinnamon brown (g1,2,7, h 2,3, k4,5, o6), edge white fimbriate. Stipe 2–8 cm tall, 1.5–6 mm thick, fistulose, sometimes compressed, equal or somewhat thicker towards base, with a membranous ring that is whitish underneath and brown (from spores) on the upper side, often deteriorated to a ring zone or sometimes apparently missing, above the ring yellow brown (k4, g7) and \pm pruinose, below at first \pm patchily white to greyish fibrillose from veil remnants, later \pm smooth, young pale brown (k1, h4), becoming darker, grey brown from base with age. Flesh brown in cap when moist, drying to pale yellow brown (b7,8, h4, k4,2); smell and taste farinaceous.

Microscopic characters: Basidia 4-spored, 28–45 \times 7–11 μm , Av(30) = 33 \times 8.9 μm , constricted, sometimes pedicellate, walls becoming somewhat thick and not collapsing. Spores (8–)10–12(–15) \times (6–)6.5–8(–10) μm , Av(330/28) = 11.1 \times 7.2 μm , $Q = 1.3$ –1.8, $Q_{av}(30) = 1.5$, amygdaliform to ellipsoid, sometimes majority of spores in one specimen rather narrowly amygdaliform, sometimes the majority ovoid to broadly amygdaliform, deep tawny in KOH, surface smooth, marbled, to slightly rugulose, outline practically smooth to slightly rugulose, generally no perispore loosening, occasionally with very tiny blisters, but never a loosening of the perispore from \pm the whole spore surface, plage distinct, pale and smooth,

spore apex acute, blunt, or somewhat mucronate, with a pore. Cheilocystidia numerous, rendering the edge almost sterile, 37-68(-100) x 7-15(-19) x 2.5-7 x 2.5-6(-10) μm , ventricose and mostly with cylindric or subcapitate necks, usually also some fusoid or capitate cystidia present, becoming yellow brown to tawny in age. In between are sometimes many broadly clavate to vesiculose, and \pm sphaeropedunculate cystidia (cystidiols?), sometimes with short, fusoid to cylindric necks. These are best seen when a piece of the edge is firmly squashed. Pleurocystidia scattered, similar. Pileipellis mostly with an upper gelatinous layer of radial, narrow, hyaline to pale ochre, \pm flexuous and spaced hyphae, 1-5 μm wide, grading into radially repent, rather short-celled, 5-12 μm wide, evenly yellow brown incrustated hyphae; pileocystidia absent; in some collections no gelatinous hyphae seen. Caulocystidia at stipe apex, similar to hymenial cystidia. Clamp connections numerous in all tissues.

Habitats: Mainly in wet to moist sites such as in swamps and fens, also found in grasslands and fell-fields, from sea level and up to ca 800 m alt; on and among bryophytes, on peat, and among grass (noted bryophyte genera are *Drepanocladus*, *Philonotis*, *Paludella*, *Racomitrium*, *Sphagnum* and *Tomenthypnum*).

Distribution: Found in all parts of Iceland. A northern species in Europe, Siberia and North America, also occurring in alpine habitats of Central Europe and South America (J. FAVRE 1955, HORAK 1993).

Comments: Microscopically the species differs from taxa of the *G. marginata* group by spore features. The spores of *G. pseudomycenopsis* are larger, smoother and deeper coloured than those of the *marginata* group and the apical discontinuity is more like a pore in *G. pseudomycenopsis* than a callus that might be found in *G. marginata*. None or a very faint perisporial loosening sometimes occurs, but then mainly as very small pockets or ears, never along larger parts of the spore wall as is regularly seen in *G. marginata*. Habitat and some features of gross-morphology, for example somewhat brighter colours of cap and gills, also seem to distinguish the species.

The material we have referred to this species varies considerably both in gross-morphology and in types of habitats. Furthermore the shape and size of the spores are highly variable. In some cases they are predominantly long and narrow in a single mount with Q-values from 1.5-1.8; in other cases they are predominantly short and broad with Q-values from 1.3-1.4. There are, however, also intermediates and the Q-variation is not larger than in many other species. HORAK & MILLER (1992) tentatively split their collections of the species on two subordinate taxa (a and b) on account of spore shape. However, no other of the many varying characters in their material seemed to correlate with the differences in spore shape. We have met the same problem in our Icelandic material, and in the collections reported from Norway and the Faroes (GULDEN 1980, GULDEN & VESTERHOLT 2000) and we are still not able to find good criteria for splitting the collections on more taxa.

Records of *Pholiota marginata* from Iceland in Larsen (1932) and Christiansen (1941) probably belong in *G. pseudomycenopsis* as do the records of *Pholiota praticola* in Lange (1949), cf. Lange (1957, p. 37 sub *G. pumila*). The record of *G. unicolor* in HALLGRÍMSSON (1993) refers to the records of *G. marginata* by LARSEN and CHRISTIANSEN cited above.

7. *Galerina badipes* (Fr.) Kühner – Fig. 4, 7

Synonym: *G. acris* Gulden (in Gulden (1980) erroneously called *G. acre*), *G. cedretorum* (Maire) Singer var. *bispora* A. H. Sm. & Singer

Material examined: Gullbringusýsla: Heiðmörk, among wooden chips, 100–260 m alt., 18 Sept. 1975, H. Kristinsson 13741 (AMNH). Baldurshagi at Rauðavatn, 80–120 m alt., 1 Sept. 1959, ML 693 (AMNH). Suður-Píngeyjarsýsla: Vaglaskógur, Hálshreppi, 200–300 m alt., on the rotting leaf layer in open forest, 13 July 1972, 7911 (AMNH). Norður-Múlasýsla: Hrafnsgarði, Fellum, 150 m alt., in mire, on hummock, 31 Aug. 1985, HH 10052 (AMNH). Suður-Múlasýsla: Parturinn, Hallormsstað, , 40–120 m alt., in moss in larch forest, 12 Sept. 1991, HH 12932 (AMNH), in birch forest among plant debris, 4 Aug. 1993, GG 128/93 (O), on old birch log on the ground, GG 129/93 (O), in the arboretum among moss, GG 141/93 (O); Freyshólar, in young *Larix* forest, on birch wood and grass remnants, 40–50 m alt., 6 Aug. 1993, leg. GG, 13205 (AMNH), and in young forest on old twigs of *Larix* between grass, GG 187/93, 190/93 (O).

Distinction: A relatively thick-fleshed cap with an \pm inbent young margin indicate that the species belongs in subgenus *Naucoriopsis*, where, however, it is among the smaller species. The often thin but rigid, darkening stipe without a ring, but with distinct veil remnants, further characterises the species. Microscopically the rather narrow, faintly ornamented spores with distinct pore, borne on two spored basidia, are distinctive.

Gross-morphology: Cap 0.5–2.3 cm, conic, campanulate-umbonate, or convex, young with \pm inbent margin, moist fatty-sticky to slightly viscid or dry and matt, translucently striate up to 2/3 to centre, hygrophanous, moist dark red brown to yellow brown, ochre, yellow (g7, f8, h2, e3, k3,4), drying from apex to pale yellow (b6,7 (disc), k4, b7). Gills \pm adnate or with small decurrent tooth, ascending to horizontal, moderately close, pale yellowish beige, yellow, ochre, to yellow brown (e3,6, k3,4,5), edge white fimbriate. Stipe 1–7 cm tall, 1–3 mm thick, up to 4 mm at base, equal or thicker at base, rigid to hard, apex white pruinose, \pm patchily sheathed to silky fibrillose, sometimes with a fibrillose ring zone, no ring, pale yellow to pale brownish in apical part and young, becoming dark red brown to blackish brown (g8,c3). Flesh yellow brown in cap and apical part of stipe (b7), dark red brown to blackish brown in lower part; taste farinaceous, sometimes bitter.

Microscopic characters: Basidia (1-)2-spored, 20–27.5 x 6–7.5 μm . Spores 9.5–12 x (5-)5.5–7 μm , Av (50/5) = 10.7 x 6.3 μm , Q = 1.4–2.2, Q_{av} (50) = 1.7, amygdaliform

to narrowly amygdaliform, minutely rugulose, yellow brown in KOH, plage distinct, pale and smooth, pore distinct, dextrinoid. Cheilocystidia (27-)35-75 x 7-12(-15) x 2-5 x 2-9 mm, rendering the edge sterile, ventricose-fusoid, apex blunt rarely subcapitate; pleurocystidia scattered, similar, often larger and more inflated; caulocystidia similar, 45-88 x 7-12 mm. Pileipellis with a thin layer of repent, gelatinous hyphae, 1-3 mm wide, long-celled, yellow, \pm flexuous and spaced apart; underneath with broader, long- to rather short-celled, evenly yellow and somewhat zebra-incrusted hyphae; pileocystidia absent. Clamp connections numerous in all tissues.

Habitats: Among moss, grass, and litter on the ground, on herbaceous and woody remnants, coniferous as well as deciduous, for example on old sticks and logs of *Betula* and *Larix*. Growing solitarily or in small clusters, from the lowlands up to 300 m altitude in Iceland.

Distribution: Collections are from south and north Iceland. Otherwise widespread in Europe, northern parts of Asia, and North America, occurring in lowland as well as in alpine regions (SMITH & SINGER 1964, HORAK 1993).

Comments: SMITH & SINGER (1964) distinguish between *G. badipes* and *G. cedretorum* var. *bispora* on account of veil features: Both have considerable veil remnants over the lower part of the stipe, but a ring zone is only found in *G. badipes*. This feature varies in our material; in some populations a ring zone is present, in others not. Microscopically the material is very homogenous. We strongly doubt that the veil configuration at the stipe apex – annulate or not – has taxonomic significance and consider the two conspecific, with the Friesian name taking priority.

The true nature of the cap surface is an intricate question. For two of the Icelandic collections we have noted a slightly viscid cap in fresh condition. A thin layer of gelatinous hyphae was detected only in one of them. According to SMITH & SINGER (1964) *G. cedretorum* has a completely dry cap and is devoid of gelatinous hyphae, while KÜHNER (1935) indicated that \pm gelatinous hyphae were present in his *G. cedretorum* (then named *G. badipes* and later (1972) declared conspecific with *G. cedretorum* var. *bispora*). However, Kühner did not find gelatinous hyphae in his alpine-subalpine material of *G. cedretorum* var. *bispora* (KÜHNER 1972).

SMITH & SINGER (1964) have no record of smell and taste for *G. cedretorum* var. *bispora*. KÜHNER (1972) records the taste of *G. cedretorum* as simply herbaceous and emphasises that it is absolutely not farinaceous. In four of the collections from Iceland a bitter taste was noted (independently by HH and by GG), once a farinaceous-bitter taste was noted, and once no taste could be detected. The senior author has collected the species three times in Western North America and noted bitter, or bitter/burning taste in all of them, but no distinct smell. *Galerina acris* GULDEN (1980) was described as a species close to *G. cedretorum*, with an acrid-burning taste. In view of the taste variation presently found we now consider *G. acris* conspecific with *G. badipes*.

Galerina lubrica, which also is fatty-shiny and of comparable size to *G. badipes*, may be confused with *G. badipes*, especially since both have 2-spored basidia. The former is, however, more red brown and has smooth spores, distinctly capitate cheilo- and caulocystidia, and lacks pleurocystidia.

New to Iceland.

Subgenus *Galerina*

Species of this genus have \pm a typical *Galerina* stature with membranous, translucently striate caps with straight margin and slender stipes. Spores dextrinoid.

Section *Galerina*

Species of this section have stipes that are distinctly pruinose in the upper half – and generally all along to the base – due to presence of caulocystidia \pm over the entire length. The stipe also develops a warm orange brown to red brown colour with age from base upwards. A veil is present in some species and may in some cases form a tiny ring or a ring zone, but never a membranaceous ring like in subgenus *Naucoriopsis*. Microscopically the species are fairly similar to the species of *Naucoriopsis* since large and ventricose pleurocystidia are present in all species in addition to the cheilocystidia. They tend to be more acute and not so frequently (sub)capitate as in the former subgenus. In section *Galerina* the spores are rather distinctly verruculose, there is no tendency to perisporial loosening, and there is never a distinct callus/pore.

Gross-morphological features that have been used for delimitation of taxa are mainly veil development, colours and taste. Microscopic features of apparent taxonomic value are presence of pileocystidia in some taxa and presence either of 2- or of 4-spored basidia (only distinctive on form level). At least in the Icelandic material, there is little variation in spore size other than that which follows from 2- and 4-spored basidia.

In the works of SMITH & SINGER (1964) and KÜHNER (1972) there are considerable deviations in the delimitation of the taxa. Where SINGER & SMITH emphasise cystidia and veil characters Kühner places more weight on colours and taste. For example, according to SMITH & SINGER neither *G. vittiformis* nor *G. atkinsoniana* have veil, whereas both may have veil according to Kühner. Kühner also accepts a further species in the group, *G. rubiginosa* (Pers. : Fr.) Kühner, particular by showing a great contrast in colours between a pale cap (and gills) and a dark stipe (pale honey to ochre cap, ochre gills, and dark red brown stipe). This species may or may not have pileocystidia and differs from *G. vittiformis* sensu Kühner (with farinaceous smell), by lacking the smell and having much paler cap and gills. Obviously a closer study of gross-morphological features of fresh material is needed in order to sort out the taxa in this group. For practical reasons, while working with dry and often not annotated material, we have followed SMITH & SINGER (1964) and treated *G. atkinsoniana*, *G. perplexa* and *G. vittiformis* as species without veil. They are distinguished from each other on features of pileocystidia. The material with \pm veil, we refer to *G. terrestris*, a species

described by WELLS & KEMPTON (1969). The veiled taxa SMITH & SINGER describe in this section, for instance *G. rainierensis*, *G. subannulata* and *G. minima*, appear very close to *G. terrestris*, but do not perfectly match our material with regard to spore size and number of sterigmata.

8a-b. *G. atkinsoniana* A. H. Sm. var. *atkinsoniana*

Distinction: A fully pruinose, \pm fulvous to dark fulvous stipe, and a very distinctly striate cap are good field characters. Presence of ventricose pileocystidia distinguishes the species. The cystidia can sometimes be seen with a good hand lens on fresh, young caps.

8a. forma *atkinsoniana* – Fig. 5, 8a and Fig. 1, 1

Material examined: Suður-Pingeyjarsýsla: Vagnbrekka, Mývatnssveit, 280 m alt., in moss, 3 Sept. 1962, HH 1751 (AMNH); at N end of Mývatn, in *Sphagnum* and *Polytrichum*, 3 Aug. 1992, GG107/93 (O).

Distinction: Two-spored basidia distinguish the form.

Gross-morphology (GG 107/93): Cap 1–1.7 cm, conic to parabolic, very conspicuously striate to apex, hygrophanous [dry yellow brown to pale cinnamon and \pm concolorous with the stipe – HH 1751]. Gills ascending-adnate, ochre. Stipe up to 8 cm tall, 1–2 mm thick, pruinose over the entire length, yellow brown at apex, dark red brown below. Veil remnants absent. Smell/taste indistinct.

Microscopic characters: Basidia 2-spored, $27.5\text{--}31.5 \times 7.5\text{--}10 \mu\text{m}$, clavate with prominent sterigmata. Spores $12\text{--}14 \times 7.5\text{--}9 \mu\text{m}$, $Av(20/2) = 13.2 \times 8.4 \mu\text{m}$, $Q = 1.5\text{--}1.7$, $Q_{av}(20) = 1.6$, broadly amygdaliform, apically protracted or not, tawny in KOH, rugulose-verruculose, plage distinct, callus present, dextrinoid. Cheilocystidia numerous, $42\text{--}68 \times 12.5\text{--}16.3 \times 2.5\text{--}5(-7.5) \mu\text{m}$, ventricose-fusoid and fairly broad, tip blunt, sometimes subcapitate; pleurocystidia scattered, similar. Caulocystidia numerous, present from apex to base, similar to the hymenial cystidia and large. Pileocystidia similar. Clamp connections numerous in all tissues.

Habitats: Open, mossy sites, with *Sphagnum* and *Polytrichum*.

Distribution: Only collected in N Iceland. Otherwise widespread in temperate, boreal, and North Atlantic regions, but also occurring in alpine and subarctic sites in northern and Central Europe and North America (NOORDELOOS & GULDEN 1992, HORAK 1993, WATLING & GREGORY 1993, GULDEN & VESTERHOLT 2000).

Comments: Generally this is a very common species on, for example, *Polytrichum*, *Hylocomium*, and *Pleurozium*, but it also quite often occurs on *Sphagnum*. It may possibly be distinguished in the field from *G. vittiformis* by having a paler, more uniformly coloured stipe, darkening to dark fulvous at base with age, not tawny or red brown as in *G. vittiformis* ss. Smith & Singer. Populations (with pileocystidia) with the combination of pale, honey to cinnamon coloured caps, dark, red brown stipes, and spores in the lower range will match *G. rubiginosa* ss. Kühner.

New to Iceland.

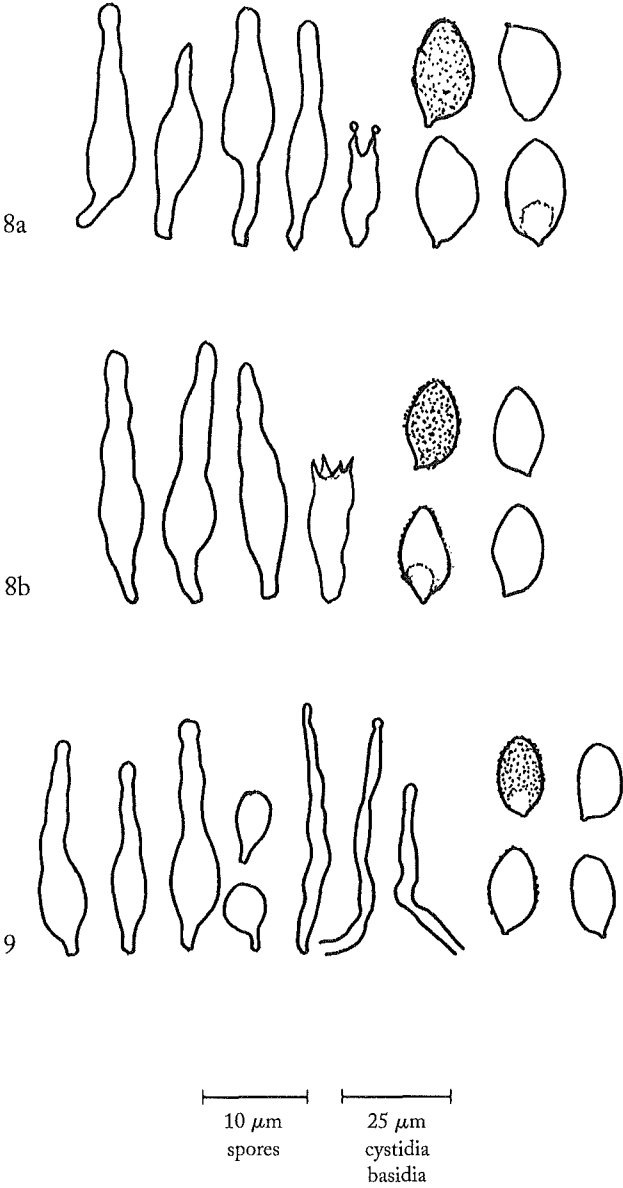


FIGURE 5. Spores, basidia, pileo- and cheilocystidia. 5, 8a *Galerina atkinsoniana* var. *atkinsoniana* f. *atkinsoniana* HH 1751; 5, 8b *G. atkinsoniana* var. *atkinsoniana* f. *quadrispora* HH 9996; 5, 9 *G. perplexa*, left: cheilocystidia and two young cheilocystidia, centre: pileo-cystidia, right: spores HH 12754.

8b. forma *quadrispora* f. nov. – Fig. 5, 8b

A formae bisporae (typica) differt basidiaetrasporae et sporae $9.5\text{--}11.6 \times 5.8\text{--}7 \mu\text{m}$. Holotypus: Iceland: Hallormsstaður, GG 131/93 (O).

Material examined: Suður-Píngeyjarsýsla: Reykjahlíð, Mývatnssveit, 280 m alt., on *Polytrichum*, 27. Aug. 1962, HH 9996 (AMNH). Suður-Múlasýsla: Hallormsstaður, in planted birch and larch forest near the primary school, on *Sphagnum*, 4 Aug. 1993, GG 131/93 (O). Freyshólar, in larch wood, on mosscovered twig of *Larix*, 30–40 m alt., 2 Sept. 1997, HH 17–97 (AMNH).

Distinction: The 4-spored basidia and relatively small spores distinguish the form.

Gross-morphology Collection HH 9996, of which there is a colour picture but no description, fits *G. atkinsoniana* very well in general appearance. GG 131/93, which is smaller than normal for *G. atkinsoniana* has: Cap 0.5 cm, broadly convex with a small papillae, striate to top, hygrophanous, moist yellow brown (k5), ochre between striar, outer margin yellow. Gills adnate with tooth, distant, ventricose, with white fringe. Stipe 3.5 cm tall, 1 mm thick, pruinose over entire length, golden yellow at top, brown below, paler than cap. Veil remnants absent.

Microscopic characters (all collections): Basidia 4-spored, $25\text{--}32.5 \times 7.5\text{--}11 \mu\text{m}$, constricted. Spores $9.5\text{--}11.6 \times 5.8\text{--}7 \mu\text{m}$, $Av(30/3) = 10.5 \times 6.4 \mu\text{m}$, $Q = 1.5\text{--}1.8$, $Q_{av}(30) = 1.7$, amygdaliform, yellow brown to tawny in KOH, rather faintly rugulose, plage distinct, callus present, dextrinoid. Cheilocystidia rendering edge sterile, $50\text{--}75 \times 7.5\text{--}15 \times 3\text{--}5.5\text{--}(7) \mu\text{m}$, ventricose-fusoid, tip blunt or subcapitate; pleurocystidia scattered, similar (not found in GG 131/93). Caulocystidia numerous, occurring over the entire length of stipe, similar. Pileocystidia rather numerous, $49\text{--}64 \times 9\text{--}17 \times 4\text{--}6.5 \mu\text{m}$ (few in HH 9969 and HH17–97), similar to the cheilocystidia. Clamp connections numerous in all tissues.

Habitat: On moss, *Polytrichum* and *Sphagnum*.

Distribution: Only collected in N and NE Iceland. Four-spored material of *G. atkinsoniana* has also been found in alpine sites in Norway and in subarctic North America (GULDEN 1980, NOORDELOOS & GULDEN 1992).

Comments: The 2-spored form of *G. atkinsoniana* appears to be the more common one at least in North America and Northern Europe. SMITH & SINGER (1964) recorded on 4-spored material of *G. atkinsoniana* var. *atkinsoniana* with spores in about the same range as in our material ($9\text{--}11 \times 5\text{--}6 \mu\text{m}$), but without formally describing a 4-spored form of this variety. This is described here. Kühner (1972) also described a 4-spored form of var. *atkinsoniana* – f. *tetraspora* – but without a Latin description. This form, however, has large spores ($13.5\text{--}15 \times 8.5\text{--}9 \mu\text{m}$), in the range of our 2-spored material or larger.

New to Iceland.

9. *Galerina perplexa* A. H. Sm. – Fig. 5, 9 and Fig. 2, 2

Material examined: Árnessýsla: Reykir í Ölfusi, 60–100 m alt., in moss, in spruce forest (*Picea sitkensis*), 27 Aug. 1990, HH 12754 (AMNH).

Distinction: The narrow pileocystidia are distinctive for the species.

Gross-morphology: The dry material, consisting of one specimen, has a pale yellow brown cap, ca 1 cm broad and a 6 cm tall stipe, ca 1.5 mm thick, yellow brown at apex and red brown in the lower half. The upper half is densely pruinose; the lower part appears more smooth and has small patches of white fibrils, mostly so near base. The gills are cinnamon brown with white fringes.

Microscopic characters: Basidia 4-spored, 25–32.5 x 7.5–9 μm , slightly constricted. Spores 8–9.5(–10) x 5.5–6.5 μm , $\text{Av}(10/1) = 8.9 \times 5.9 \text{ mm}$, $Q = 1.3\text{--}1.6$, $Q_{\text{av}}(10) = 1.5$, ovoid, ellipsoid, or amygdaliform, rather blunt at apex, yellow brown in KOH, rugulose, plage pale and smooth, not very conspicuous, pore/callus absent, dextrinoid. Cheilocystidia rendering edge sterile, 55–70 x 5–12 x 2–4 μm , ventricose-fusoid, mostly rather narrow, apex blunt; pleurocystidia similar, scattered. Caulocystidia numerous over entire length of stipe, ventricose-fusoid, large. Pileipellis has a thin layer of rather narrow and long-celled, 3–8 μm wide hyphae grading into more short-celled and inflated hyphae, up to 40 μm wide, all \pm ochre zebra-incrusted. Pileocystidia scattered, narrowly ventricose, fusoid or subcapitate, flexuous, 60–70 μm long, 5–7 μm wide, slightly thick-walled. Clamp connections numerous in all tissues.

Distribution: SMITH & SINGER (1964) cite a number of collections of this species in North America between Michigan and California, probably from forested regions. LAMOURE et al. (1982) report on material of this species from Greenland.

Comments: The narrow, slightly thick-walled pileocystidia and the small spores characterize the species. The spores, only rarely reaching 10 μm , are in the lower range for the section *Galerina* in Iceland. This appears to be the first record of *G. perplexa* in Europe.

10a-b. *Galerina vittiformis* (Fr.) Singer var. *vittiformis*

Distinction: A fully pruinose, \pm red brown stipe and a distinctly striate cap are typical features. Absence of pileocystidia distinguishes the species. According to WATLING & GREGORY (1993) this is the correct spelling for the species generally known as *G. vittaeformis*.

10a. forma *vittiformis* – Fig. 6, 10a

Synonym: *G. rubiginosa* (Pers. : Fr.) Kühner p.p.

Distinction: Two-spored basidia but also the spore size characterise this taxon, see comments.

Material examined: Eyjafjarðarsýsla: Víkurbakki, Árskógsströnd, 10–20 m alt., among heather and moss in grassland, 20 Sept. 1968, HH 5439 (AMNH).

Suður-Pingeyjarsýsla: Vaglaskógur, Hálshreppi, 200–300 m alt., in *Polytrichum* and other mosses in open forest, 6 Sept. 1988, HH 12103 (AMNH); N end of Mývatn, in *Mnium*, *Sphagnum* and other mosses, 3 Aug. 1993, GG 104/93 (O).
Suður-Múlasýsla: Fjarðarheiði, 600 m alt., in half dry slope near spring, in moss, 25 Aug. 1987, HH 11375 (AMNH).

Gross-morphology (coll. HH 11375): Cap 0.4–0.7 cm wide, 0.4–0.5 cm tall, conic to broadly umbonate, finally with reflexed margin, fatty shiny, striate half way to apex, hygrophanous, moist greyish yellow brown (o6, c6), drying from apex to yellow (brown) or pale greyish yellow brown (e3, k4, h4). Gills rather distant, brown to red brown. Stipe pruinose, yellow brown to red brown (h3, k5, g2), darkest below. Veil remnants absent.

Microscopic characters: Basidia 2-spored, $25\text{--}32.5 \times 7.5\text{--}9 \mu\text{m}$. Spores $9.7\text{--}12 \times 5.8\text{--}7 \mu\text{m}$, $Av(30/3) = 10.8 \times 6.6 \mu\text{m}$, $Q = 1.5\text{--}1.9$, $Q_{av}(30) = 1.7$, narrowly amygdaliform, sometimes with a snout, pale yellow brown in KOH, rugulose, plage distinct, callus indistinct, dextrinoid. Cheilocystidia rendering edge sterile, $45\text{--}73 \times 6\text{--}16 \times 3\text{--}6.3(-9) \mu\text{m}$, ventricose-fusoid, occasionally subcapitate; pleurocystidia rather numerous, scattered, similar. Caulocystidia numerous over entire length of stipe, similar; pileocystidia absent. Clamp connections numerous in all tissues.

Habitat: Among moss and grass in rather dry sites, from sea level up to 600 m alt.

Distribution: According to SMITH & SINGER (1964) this 2-spored form of *G. vittiformis* is widely distributed in North America and it occurs also in Europe, Japan and probably in Northern Asia. According to HORAK (1993) it grows in subarctic Siberia, in Greenland and in alpine regions of Northern and Central Europe.

Comments: The fruitbodies are generally larger than in the Icelandic collection described here (the only one for which we have notes on gross-morphology). The spores of this 2-spored form in Iceland are smaller than in the two-spored form of *G. atkinsoniana* (av. = $10.8 \times 6.6 \mu\text{m}$ for *G. vittiformis* var. *vittiformis* f. *vittiformis* and av. = $13.2 \times 8.4 \mu\text{m}$ for *G. atkinsoniana* var. *atkinsoniana* f. *atkinsoniana*). This may constitute an additional criterion for identification of the species, but the material of both taxa is scanty. Smaller spores in *G. vittiformis* than in and *G. atkinsoniana* (2-spored forms) are, however, also reported by SMITH & SINGER (1964) and WATLING & GREGORY (1997). Compared to the 4-spored variety of *G. vittiformis* (see below), the spores of var. *vittiformis* f. *vittiformis* are paler and slightly longer, not wider.

One collection (GG 104/93) fits the description of another variety of *G. vittiformis*, viz., var. *albescens* f. *bispora* A.H. Sm. & Singer, with yellowish cap colours (striae and centre honey coloured, in-between more lemon) and an evenly yellowish stipe. It has spores in the same range as the other collections: $10\text{--}11.5 \times 5\text{--}7 \mu\text{m}$, $Av(10) = 10.5 \times 6.3 \mu\text{m}$. This variety differs from the type variety only in colours and we hesitate to refer it to a separate taxon.

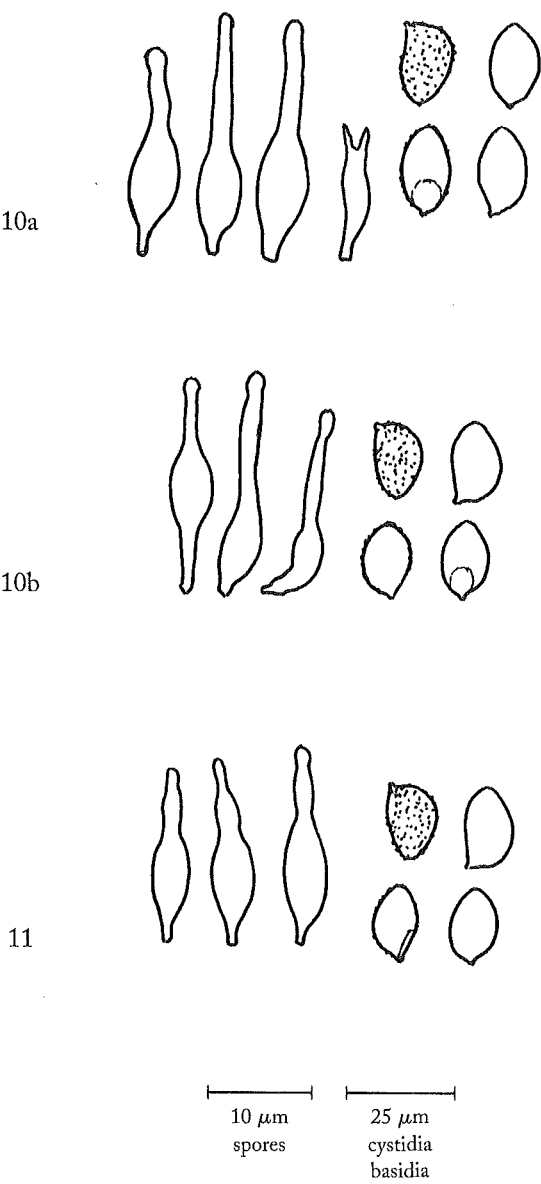


FIGURE 6. Spores, basidium, cheilocystidia. 6, 10a *Galerina vittiformis* var. *vittiformis* f. *vittiformis* GG 104/93; 6, 10b *G. vittiformis* var. *vittiformis* f. *tetraspora* GG 153/93; 6, 11. *G. terrestris* GG 58/93.

Material with pale caps and gills, contrasting a dark, red brown stipe would match *G. rubiginosa* ss. Kühner (1972), and only those with brown caps and gills and a \pm concolorous stipe, having in addition a farinaceous smell, would belong in *G. vittiformis* in the sense of Kühner.

LANGE (1949) reported on 2-spored material of *G. vittiformis* from the Hekla volcano in S Iceland.

10b. forma *tetraspora* A. H. Smith & Singer – Fig. 6 and Fig. 10

Non *G. vittiformis* var. *vittiformis* f. *tetraspora* sensu Kühner 1972.

Distinction: Four-spored basidia and rather short and broad, tawny spores distinguish this form.

Material examined: Rangárvallasýsla (1). Árnessýsla (9). Gullbringusýsla (4). Dalasýsla (1). Vestur-Bardastrandasýsla (1). Vestur-Ísafjarðarsýsla (1). Vestur-Húnavatnssýsla (1). Eyjafjarðarsýsla (4). Suður-Píngeyjarsýsla (8). Norður-Múlasýsla (9). Suður-Múlasýsla (8). Múlasýsla (1). Central Highland (2).

Gross-morphology: Cap 0.5–2 cm, conic, convex-umbonate, or convex, striate to disc, fatty shiny or matt, hygrophanous, moist dark red brown to yellow brown (h1,2,3 g8, g2, k5, e3,4), margin paler, drying from centre to pale yellow brown or pale beige (e3, k1,4, b6,7). Gills ascending-adnate, (sub)distant, young pale yellow then ochre to yellow brown (k5, g1,2,7, h2,3). Stipe 3–7 cm tall, 1–2.5 mm thick, densely pruinose at least to the middle, often over the entire length, evenly pale yellow brown or more often red brown from base and upwards, occasionally red brown in the entire length (c1,2, o1). Veil remnants absent. Smell and taste indistinct.

Microscopic characters: Basidia 4-spored, 25–37.5 x 7–10 μm , constricted. Spores 8–10.5(–11) x 5.5–7 μm , $\text{Av}(70/6) = 9.9 \times 6.5 \mu\text{m}$, $Q = 1.3\text{--}1.8$, $Q_{\text{av}}(70) = 1.5$, ovoid, broadly and bluntly ellipsoid, or broadly amygdaliform, tawny in KOH, rather coarsely rugulose, plage smooth and pale, callus indistinct, dextrinoid. Cheilocystidia rendering edge sterile, 30.7–75 x 7–14(–18) x 2.5–6(–10) μm , ventricose-fusoid, rarely subcapitate, walls becoming yellow brown from base; pleurocystidia scattered, sometimes few, similar. Caulocystidia over the entire length of stipe, similar; pileocystidia absent. Clamp connections numerous in all tissues.

Habitats: Often collected in forests on bryophytes such as *Rhytidiadelphus*, *Drepanocladus*, *Racomitrium* and *Hylocomium*. Also found in open places and in more moist sites, among grass and *Drepanocladus*. Three collections are from *Sphagnum*. Collections are from sea level up to ca 600 m alt.

Distribution: Collected in all parts of Iceland. A common and widespread taxon in temperate and boreal Europe and North America. Also known from subarctic Siberia and Greenland, and from alpine habitats of Northern and Central Europe.

Comments: This appears to be the most common form of *G. vittiformis*, and also the most common representative of the whole *vittiformis-atkinsoniana* complex in

Iceland. The form differs from *G. vittiformis* var. *vittiformis* f. *tetraspora* in the sense of KÜHNER (1972), which is a taxon with veil and a farinaceous smell, largely corresponding to our *G. terrestris*. Considering that a great part of the present material is voucher material without notes, and that the main differences between *G. vittiformis* and *G. terrestris* are presence of veil and smell in the latter, it is possible that some of the collections rather belong in *G. terrestris*. The spore range is the same.

Coll. HH 9848 fits the description of the 4-spored var. *albescens* A.H. Sm. & Singer, a variety defined on colour deviations. A photo shows slender and mainly ochre coloured specimens with conic, deep ochre caps drying up to almost white, and stipes that are paler and more evenly coloured than normally seen in *G. vittiformis*. No veil remnants seen in dry material (or photo). The spore range is that of the type variety (8.5–9.7 x 5.3–6.8 μm , $\text{Av}(10) = 8.9 \times 6.0 \mu\text{m}$), but the spores are paler, yellow brown in KOH, minutely rugulose, and the plage is not very distinct, best seen in profile as a hump on the outline. This also fits the original description of the 4-spored form of the variety. We hesitate to refer it to another variety than the type variety.

Also Coll. HH 11090 has pale spores corresponding to those of var. *albescens*, but the fruitbody colours (cap and lower part of stipe red brown) agree with var. *vittiformis*. Coll. HH 5021, found on *Sphagnum*, has also rather pale spores, slightly larger than in the rest of our collections: 10–12 x 6–7 μm , and caulocystidia are very few in lower part of stipe.

Previously recorded by LANGE (1949) from W-side of Hekla, 200–600 m alt.

11. *Galerina terrestris* V. L. Wells & Kempton – Fig. 6, 11

Synonym: *G. vittiformis* var. *vittiformis* f. *tetraspora* ss. Kühner 1972.

Material examined: Eyjafjarðarsýsla: Akureyri, 20–40 m alt., in *Racomitrium*, 26 July 1985, HH 9662 (AMNH). Suður-Pingeyjarsýsla: Vaglaskógur, on river bank between *Salix arctica* and *S. lanata*, among small mosses, 1 Aug. 1993, GG 30/93 (O); Along the road between Akureyri and Vaglaskógur, road side with *Betula nana* and *Cladonia* spp., among small mosses on silt/soil, 1 Aug. 1993, GG 58/93, 59/93. Krafla, N of the power station, between small mosses and *G. harrisonii*, 2 Aug. 1993, GG 65/93, 66/93, 71/93 (O) and close to recent lava flow, among small mosses GG 80/93, 86/93 (O). Norður-Múlasýsla: Eigilsstaðaskógur, in shallow soil on rock in birch forest, among *Racomitrium*, 7 Aug. 1993, GG 220/93, 221/93 (O). Suður-Múlasýsla: Eyvindaráreyrar, river bank, on naked soil among *Racomitrium*, 6 Aug. 1993, GG 196/93 (O).

Distinction: The presence of veil distinguishes this species from *G. vittiformis*, *G. atkinsoniana* and *G. perplexa*. The typical habitat, on silt and soil among small mosses, appears characteristic.

Gross-morphology: Cap 0.3–0.8 cm, conic to convex, translucently striate, hygrophanous, moist brown, red brown to ochre (f3, e3, k3), paler at margin, drying from apex to yellow (b4), margin sometimes with a whitish brim of veil remnants. Gills ascending, adnexed to adnate, moderately close, ventricose,

slightly paler than cap, pale beige, ochre to red brown (h3). Stipe 1.5 cm tall, 1 mm thick, pruinose over entire length, evenly yellowish to ochre, or darker, more red brown below (h3), with pale fibrils from veil, sometimes forming a ring zone. No particular smell or taste.

Microscopic characters: Basidia 4-spored, $22.5\text{--}37.5 \times 7.5\text{--}10 \mu\text{m}$, clavate. Spores $(8.5\text{--})9\text{--}12 \times 5\text{--}7(-8) \mu\text{m}$, $Av(50/5) = 10.1 \times 6.6 \mu\text{m}$, $Q = 1.3\text{--}1.8$, $Q_{av}(50) = 1.5$, ovoid to amygdaliform or broadly amygdaliform, sometimes snout-like at apex, tawny to yellow brown in KOH, rugulose, plage distinct, pore/callus absent (but thinning of walls at apex), dextrinoid. Cheilocystidia rendering edge sterile, $42\text{--}68 \times 8\text{--}20 \times 2.5\text{--}7.5 \mu\text{m}$, ventricose-fusoid to ventricose-cylindric (lageniform), apex blunt to subcapitate; pleurocystidia often few, similar. Caulocystidia over the entire length of stipe, similar to those in hymenium; pileocystidia absent. Clamp connections numerous in all tissues.

Habitats: On silt and bare soil among small mosses and often *Racomitrium*; in pioneer communities such as on riverbanks, at roadsides, at lava flows, etc.

Distribution: Boreal Alaska, mountain and alpine regions of Northern and Central Europe (WELLS & KEMPTON 1969, HORAK 1993, WATLING & GREGORY 1993). Also collected in glacier forfield at Lyman Glacier, Washington (GG, unpubl.).

Comments: According to the original description of the species and our own experience with material from alpine sites in Norway and North America a \pm pronounced farinaceous taste can be present. No particular taste was noted in the Icelandic material. This taxon corresponds largely to *G. vittiformis* var. *vittiformis* f. *tetraspora* of KÜHNER (1972) and is not referable to *G. vittiformis* in the sense of SMITH & SINGER (1964) because of the veil.

The specimens of coll. no. 86/93 have narrowly amygdaliform spores, $9\text{--}10 \times 5\text{--}5.5 \mu\text{m}$, not quite in accordance with the rest of the material.

New to Iceland.

Section *Mycenopsis* A. H. Sm. & Singer

The species of this section lack the pruinose stipes found in section *Galerina*. Microscopically they differ from that section (and from species of subgenus *Naucoriopsis*) by lacking pleurocystidia. The shape and size of the cheilocystidia are rather variable, but never tibiiform as in subgenus *Tubariopsis* and never so large and acute as in subgenus *Naucoriopsis* and in the previous section *Galerina*. Many of the species have smooth or almost smooth spores.

12. *Galerina jaapii* A. H. Sm. & Singer – Fig. 7, 12

Synonym: *G. mycenoides* (Fr.) Kühner.

Material examined: Suður-Pingeyjarsýsla: Krafla, close to lava-flow from recent volcanic eruption, on soil among small mosses, 2 Aug. 1993, GG 79/93 (O).

Suður-Múlasýsla: Keldhólar, Völlum, 60-80 m alt., on mud in dried up ditch, 27 July 1991, HH 12978 (AMNH).

Distinction: The species can be recognised on the small annulus or annulate zone and its slender stature. Narrow, ornamented spores borne on 2-spored basidia, combined with absence of pleurocystidia distinguish the species.

Gross-morphology: Cap 0.7 cm wide, convex, translucently striate about 2/3 to apex, margin pale, crenulate, matt, hygrophanous, moist yellow brown to red brown (h2,3), margin paler. Gills sinuate, subdistant, ochre. Stipe 1.5 \pm 2 cm tall, 1.5 mm thick, minutely pruinose at apex, red brown, darker than cap, with white, annulate veil remnants near apex. Smell and taste indistinct.

Microscopic characters: Basidia 2-spored, 25-30 x 6.3-10 μ m, clavate-constricted. Spores 10.5-14.5 x 6-7.5 μ m, $Av(10/1) = 12.2 \times 7.1 \mu$ m, $Q = 1.5-2.0$, $Q_{av}(10) = 1.7$, narrowly amygdaliform to naviculate and occasionally with an apical snout, yellow brown to tawny in KOH, rugulose, plage smooth and pale, a thinning of the inner wall at apex makes the impression of a pore, dextrinoid. Cheilocystidia rendering edge sterile, 32-63 x 7-17.5 (-22.5) x 3-5 x 3.8-8 μ m, ventricose-capitate, occasionally with crystals on head; pleurocystidia absent. Caulocystidia at apex similar, up to 110 μ m long. Clamp connections numerous in all tissues.

Habitats: On soil and mud, among mosses. Generally the species seems to prefer rather wet habitats.

Distribution: Collected in N and NE Iceland. Otherwise widely distributed in Europe where it occurs from temperate lowland to subalpine sites; in Siberia it is known also from the subarctic tundra (HORAK 1993, WATLING & GREGORY 1993). In North America it is known from the Pacific Northwest to the Great Lakes Region (SMITH & SINGER 1964) and the form *mamillata* is reported from Quebec in the eastern part of the continent.

Comment: The spores are frequently snout-like outdrawn at apex and an apical thinning of the inner wall is seen in most spores. This may under certain circumstances look like a pore or a callus.

New to Iceland.

13. *Galerina lubrica* A. H. Sm. – Fig. 7, 13

Synonyms: *Naucoria macrospora* J.E.Lange var. *borealis* F.H.Møller, *G. pseudotundrae* Kühner 1972.

Material examined: Eyjafjarðarsýsla: Glerárdalur, at the water reservoir, 350 m alt., in *Nardus-Anthoxanthum* depression with mosses, 11 Sept. 1968, HH 5250 (AMNH).

Distinction: Red brown colour shades in all parts of the fruitbodies, a fatty-shiny cap, and a \pm curved stipe, dark red brown and fibrillose at base, seem to be good field characters of this species. Microscopically the smooth spores born on 2-spored basidia combined with the distinctly capitate cheilocystidia distinguish the species.

Gross-morphology: Cap ca 1.5–3 cm, umbonate to convex, fatty shiny but not viscid, translucently striate up to half way to umbo, hygrophanous, moist red brown (g1, h1), dry pale red brown (h3), flesh at apex ca 2 mm. Gills adnate to emarginate, somewhat paler than cap, edge paler. Stipe ca 3–4 cm tall, 2–3 mm thick, often somewhat curved and flexible (not rigid), apex pruinose, downwards silky fibrillose and shiny, yellow brown, more red brown downwards. Smell indistinct.

Microscopic characters: Basidia 2-spored, $27.5\text{--}32.5 \times 7.5\text{--}8 \mu\text{m}$, narrow at apex, with stout sterigmata. Spores $13\text{--}14.5 \times 7\text{--}8(-9) \mu\text{m}$, $Av(10/1) = 13.3 \times 7.5 \mu\text{m}$, $Q = 1.6\text{--}1.9$, $Q_{av}(10) = 1.8$, ellipsoid to amygdaliform, rather narrow, with bluntly conic apices, rather pale yellow brown to greyish brown in KOH, smooth, surface minutely marbled, plage distinct, seen as a pale, even and not marbled patch in face view and as a suprahilar applanation in profile view, no pore or callus, dextrinoid. Cheilocystidia rendering edge sterile, $35\text{--}45 \times 6\text{--}11 \times 3\text{--}4.5 \times 4\text{--}12.5 \mu\text{m}$, ventricose-capitate, heads often as wide or wider than ventral part; pleurocystidia absent. Stipitipellis of long-celled, little inflated, $4\text{--}7 \mu\text{m}$ wide, yellow hyphae; caulocystidia numerous, $32\text{--}87 \times 5\text{--}10 \times 4\text{--}7 \times 5\text{--}15 \mu\text{m}$, ventricose-capitate or hyphoid-capitate. Pileipellis with a thin upper layer of narrow, separated, $1\text{--}3 \mu\text{m}$ wide, yellow hyphae; underneath are packed, short-celled, inflated, yellow incrusted hyphae, up to 30 mm wide; no pileocystidia. Clamp connections numerous in all tissues.

Habitats: In Iceland found in grassy depression with mosses. The North-American species *G. lubrica* was originally found in the alpine zone, growing gregariously on wet moss. Characteristic sites of *G. pseudotundrae*, described from Europe (see below), are various kinds of snow-beds, wet and dry, with grass, sedges and mosses and also naked peat and soil, on acidic as well as calcareous soils (HORAK 1993, GULDEN & VESTERHOLT 2000).

Distribution: North America, The Alps, alpine Norway, Shetland, The Faroe Islands, Iceland.

Comments: The dried material of our collection is dull and rather dark grey brown in all parts, more like an *Inocybe* than a *Galerina*. The description of the fresh material runs: cap fatty-shiny but not viscid. The material readily keys out with *G. lubrica* in SMITH & SINGER (1964) when the key point (p. 176) "Pileus viscid to lubricous or shining when fresh" is chosen and not the alternative: "Pileus merely moist, lacking a fatty lustre". This fatty-shiny look corresponds well with the finding of a thin, superficial layer of \pm separated, narrow and pale hyphae in the pileipellis. The cheilocystidia in our material are more capitate than illustrated by SMITH & SINGER (1964) and the stipes are darker below and more silky fibrillose. Otherwise our material agrees very well with the original description, which was based on a single collection from a high elevation site in the Rocky Mountains. The type locality, Ophir, is an old mining town in Colorado, San Miguel county, ca 3000 m alt. (Nancy Weber, pers. comm.). Apparently this is the first record of *G. lubrica* since it was originally described.

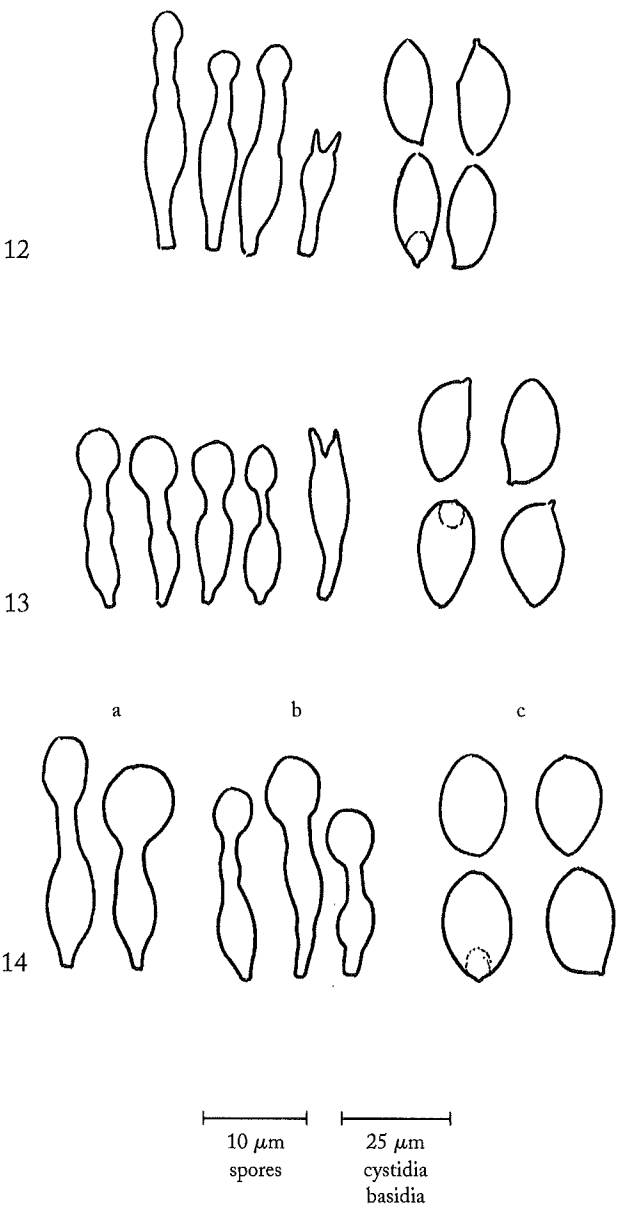


FIGURE 7. Spores, basidia and cheilocystidia. 7, 12 *Galerina jaapii* HH 12978; 7, 13 *G. lubrica* HH 5250; 7, 14. *G. harrisonii*, a HH 11815, b GG 67/93, c GG 65/93.

However, the material also fits the description of *G. pseudotundrae* Kühner (1972) and we have no doubt that this is the same species. The cap of this species was originally described as ± “luisant” and Kühner’s description of the pileipellis perfectly match our observations. GULDEN & VESTERHOLT (2000) found this to be the same species as MØLLER (1945) described as *Naucoria macrospora* var. *borealis*.

14. *Galerina harrisonii* (Dennis) Bas & Vellinga – Fig. 7, 14

Synonym: *Phaeomarasmium harrisonii* R. W. G. Dennis, *Flammulaster harrisonii* (R.W.G. Dennis) Watling, *Galerina antheliae* Gulden

Material examined: Árnessýsla: Hengill, on bare soil with *Carex*, 300 m alt., 11 Aug., 1959, ML 562 (AMNH) and 600 m alt., ML 624 (AMNH); Selfjall, Ölfusi, with *Salix* and *Vaccinium*, 420 m alt., 2 Aug. 1959, ML 246 (AMNH). Eyjafjardarsýsla: Hálsdalur, Svarfaðardal, 400 m alt., in *Salix herbacea* association with *Racomitrium* and *Lescuria*, 25 Aug. 1970, HH 6556 (AMNH); Varmavatnshólar, Öxnadal, 320–380 m alt., at creek from spring, in wet moss, *Sphagnum* etc. 17 Aug. 1984, HH 9399 (AMNH). Suður-Pingeyjarsýsla: Krafla, on bare soil among small mosses in small depressions, near snow bank and small stream, often between *Salix herbacea* and on *Anthelia*, 2 Aug. 1993, GG 64/93, 65/93, 67/93, 68/93, 70/93, 72/93 and 73/93 (O). Suður-Múlasýsla: Mjóafjarðarheiði, 550 m alt., in snow-bed with *Anthelia*, 5 Aug. 1988, HH 11815 (AMNH), Oddsskarð, 600 m alt., fell-field, among *Racomitrium*, 7 Aug. 1993, GG 219a/93 (O). Central Highland: Stapaá, Öxnadal, snow-bed, 650 m alt., 25 Aug. 1976, HH 13740 (AMNH).

Distinction: The rich veil development, generally seen as a fibrillose ring zone and additional fibrils in lower part of stipe, sometimes also on cap margin is a good field character, together with the generally convex and brown cap. The broad, smooth spores and the broad basidia are distinctive.

Gross-morphology: Cap 0.7–1.5 (–2.5) cm, broadly conic to plano-convex, becoming striate, up to half way to centre, matt, margin ± crenulate and with ± veil remnants, hygrophanous, moist red brown, more yellow brown towards margin (c3, g8, f8), yellow brown as dry. Gills adnate, often with small tooth, horizontal, ventricose, subdistant, pale beige, ochre, yellow brown (k5, h3), edge minutely fimbriate. Stipe up to 2 cm tall, 1–2 mm thick (compressed up to 4 mm thick), apex fine pruinose, the rest fibrillose from pale veil remnants, often with an annulate, fibrillose zone 2–3 mm from apex, often curved, apex beige or ochre like the gills, often darker and more red brown downwards (h1,2,3, g8). Flesh concolorous with the cap; taste faintly farinaceous.

Microscopic characters: Basidia 4-spored, unusually broad, 22.5–40 x 8.8–13.8 µm, clavate or with constriction, becoming brown in age. Spores (10.5–)12–14(–16) x 7–10 µm, $Av(60/5) = 12.8 \times 8.5 \mu m$, $Q = 1.3–1.8$, $Q_{av}(60) = 1.5$, ovoid, broadly ellipsoid, broadly amygdaliform, deep tawny in KOH, practically smooth, surface marbled, outline smooth to faintly rugulose, plage distinct, seen as a an even and pale spot on the surface and in profile view, pore/callus absent (but the thick inner wall is thin at apex), dextrinoid. Cheilocystidia rendering edge sterile, 27–55(–75)

x 7-15 x 3.5-6 x 3-16.3 mm, often not much protruding, shape variable, generally ventricose-capitate, often with head as wide or wider than the ventral inflation, heads sometimes spear-head shaped, rarely without head, neck fairly short or long and \pm flexuous or beaded; pleurocystidia absent. Caulocystidia similar, large. Clamp connections numerous in all tissues.

Habitats: Among small mosses, often *Anthelia*, also *Racomitrium*, in snow-beds and other alpine vegetation; found up to 650 m alt. in Iceland.

Distribution: Collected in southern, northern and eastern parts of Iceland. The known distribution is restricted to northern regions of Europe, Siberia and western North America (HORAK 1993, GULDEN & VESTERHOLT 2000).

Comments: *G. harrisonii* has broader spores than any other of the species belonging in section *Mycenopsis* and its cystidia are generally rather stout and considerably inflated at apex. *Galerina lubrica* has spores almost in the same range, but these are born on 2-spored basidia. In collections GG 219a/93 and HH 6556 the majority of the cheilocystidia was more slender with less inflated heads than normal (heads 4-7.5 mm).

I have studied type material of *Phaeomarasmium harrisonii* R.W.G. Dennis and, like Vellinga (1986), found it to match the type material of *G. antheliae* Gulden and the Icelandic material (spore size: Range = 12-14 x 7-9.7 μ m, $Av(20) = 12.7$ x 8.6 μ m, $Q = 1.4-1.9$, $Q_{av}(20) = 1.5$).

Previously recorded from Iceland by HALLGRÍMSSON (1993).

15. *Galerina mniophila* (Lasch) Kühner - Fig. 8, 15

Material examined: Árnessýsla: Selfjall, Ölfusi, 300-350 m alt., 2 Aug. 1959, ML 201 (AMNH), Hengill, in moss, 350-380 m alt., 11 Aug. 1959, ML 550 and 551 (AMNH). Borgarfjarðarsýsla: Stálpastaðir, Skorradal 80 m alt., in moss in mixed frondose and conifer forest, 13 Aug. 1989, HH 13082 (AMNH). Mýrasýsla: Hreðavatn, among moss (*Hylocomium*, *Pleurozium*) in mire, 60-120 m alt., 20 July 1962, HH 1105 (AMNH). Vestur-Barðastrandasýsla: Kleifaheiði, in wet moss, 350 m alt., 31 Aug. 1971, HH 7368 (AMNH), Hálfván, in moss (*Sphagnum* etc.), 480-520 m alt., 7 Sept. 1971, HH 7393 (AMNH). Vestur-Ísafjarðarsýsla: Hrafnseyri, Arnarfjörður, snow-bed with moss, 0-100 m alt., 1 Sept. 1971, HH 7305 (AMNH), Fell in Dýrafirði, in moss, 2 Sept. 1971, HH 7459 (AMNH). Norður-Ísafjarðarsýsla: Gervidalur, in *Racomitrium*, 60-180 m alt., 4 Sept. 1971, HH 7561 (AMNH), Kleifarkot, Mjóafirði, grassland, 0-100 m alt., 4 Sept. 1971, HH 7630 (AMNH). Eyjafjarðarsýsla: Vellir, Svarfaðardal, in mire, *Sphagnum*, 300 m alt., 31 July 1963, HH 2196 (AMNH). Suður-Múlasýsla: Eyjólfsstaðaskógur, Héraði 50-100 m alt., at peat-land border in birch forest, in deep moss, *Dicranum*, *Pleurozium* and *Sphagnum*, 7 Sept. 1993, HH 13239 (AMNH), Breiðavað, peat area, on short *Sphagnum*, 5 Aug. 1993, GG 170/93 (O).

Distinction: The pale stipe and the dull colours of the cap, often with a watery hyaline apex, are good field characters. Microscopically the rather long and

apically not or only moderately inflated cheilocystidia distinguish the species.

Gross-morphology: Cap 0.6-1.5 cm, conic to campanulate, striate to umbo, hygrophanous, moist olive brown to deep ochre with pale margin (f7,8, h 3), drying to yellow (k7), yellow brown to watery olive at apex. Gills ascending-adnate, yellow brown (o6). Stipe 2.5-7.5 cm tall, 1-2 mm thick, apex fine pruinose, in lower part with faint remnants of veil, pale at apex and towards base, in the middle pale yellow brown to pale greyish yellow brown (g6,7, h6). Smell and taste indistinct.

Microscopic characters: Basidia 4-spored, 22.5-32.5 x 7.5-10 μm , constricted. Spores 10-13 x 6-8 μm , $Av(20/2) = 11.8 \times 7.0 \mu\text{m}$, $Q = 1.5-2.0$, $Q_{av}(20) = 1.7$, amygdaliform, pale yellow brown to olive brown in KOH, minutely rugulose to practically smooth, plage distinct, pore/callus absent, dextrinoid. Cheilocystidia rendering edge sterile, 35-65 x 5-17 x 3-6 x 3-7.5 μm , rather variable in shape, mainly ventricose cylindric to subcapitate, head - when present - generally ellipsoid, mucronate or spearhead shaped, occasionally forked; pleurocystidia absent. Caulocystidia numerous at apex, \pm hyphoid or ventrally inflated, flexuous. Clamp connections numerous in all tissues.

Habitat: Often in forests, but found in mires, grassland, snow-beds as well; on peat and various bryophytes: *Dicranum*, *Hylocomium*, *Pleurozium*, *Racomitrium* and *Sphagnum*.

Distribution: A rather common and widespread species in Iceland, collected in most parts of the island. A common species in temperate and boreal regions, but also known from alpine, subarctic, and arctic regions in northern Europe and North America (HORAK 1993).

Comment: Previously recorded from Iceland by HALLGRÍMSSON (1993).

16a. *Galerina pumila* (Pers. : Fr.) M. Lange non sensu M. Lange var. *pumila* - Fig. 8, 16a

Synonym: *G. mycenopsis* (Fr.) Kühner ss. Ricken

Material examined: **Árnessýsla:** Ölkelduháls, Ölfusi, in *Racomitrium*, 260-400 m alt., 5 Aug. 1959, ML 343 and 349 (AMNH), Klóarvegur, Reykjadal, Ölfusi, in *Racomitrium*, 260-340 m alt., 5 Aug. 1959, ML 393 (AMNH), Hveragerði (Skólasel-Tindar), 20-120 m alt., 7 Aug. 1959, ML 420 (AMNH). **Vestur-Húnavatnssýsla:** Tannstaðir, Hrútafirði, on *Racomitrium*, 60-120 m, 31. Aug. 1969, HH 6432 (AMNH).

Distinction: A slightly robust *Galerina* of rather pale, ochre colours (dry) and pale, slightly thickish stipe. Microscopically distinct by having completely smooth, dextrinoid spores, more ellipsoid than amygdaliform, without plage but depressed over plage area. Also the little inflated, generally flexuous cheilocystidia are characteristic.

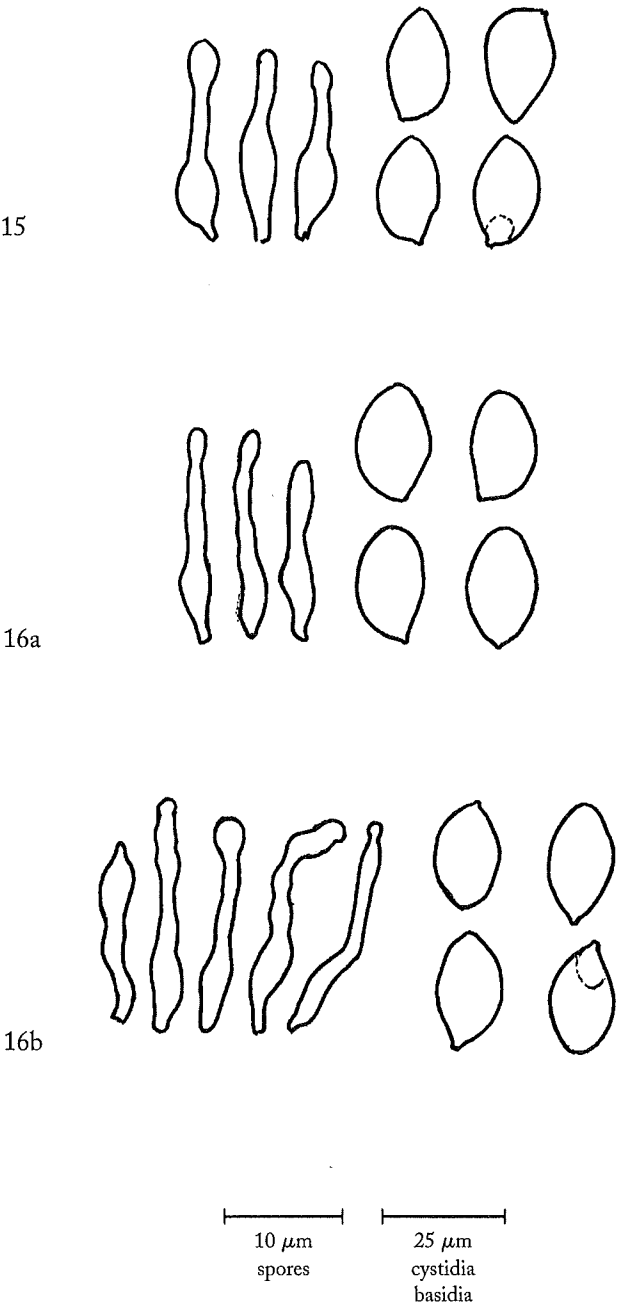


FIGURE 8. Spores and cheilocystidia. 8, 15 *Galerina mniophila* GG 170/93; 8, 16a *G. pumila* var. *pumila* ML 349; 16b *G. pumila* var. *subalpina* HH 6246.

Gross-morphology (dry material): Cap 0.5–1 cm wide, conic with inbent margin, evenly ochre to yellow brown, young more orange brown. Gills ascending, adnate to decurrent, normally spaced to subdistant, ochre to yellow brown with very narrow white fringe. Stipe 2–4 cm tall 1–2 mm thick, equal or often thicker downward, \pm flexuous, about concolorous with the cap or paler, not darker below, apex finely pruinose, minutely white fibrillose, base \pm white tomentose. Veil, white, evanescent, extended from cap margin to stipe in buttons.

Microscopic features: Basidia 4-spored, $36\text{--}44 \times 8.4\text{--}12 \mu\text{m}$, constricted or clavate. Spores $10.6\text{--}13.6 \times 6.8\text{--}7.7\text{--}(8.2) \mu\text{m}$, $Av(30/3) = 11.8 \times 7.3 \mu\text{m}$, $Q = 1.5\text{--}1.9$, $Q_{av}(30) = 1.6$, fulvous-pale tawny in KOH, ellipsoid in front view, in profile almost equilateral, applanate to depressed over plage area, smooth, apex rather blunt and a small darker spot seen in many spores, plage absent, dextrinoid. Cheilocystidia rendering edge sterile, long and narrow, generally with one or more apical inflations, ventral part little inflated, $36\text{--}72 \times 4\text{--}10 \times 3.6\text{--}5 \times 3\text{--}9.6 \mu\text{m}$; pleurocystidia and pileocystidia absent. Pileipellis with a thin layer of radial, narrow, $1\text{--}2 \mu\text{m}$ wide, hyaline hyphae overlaying $5\text{--}20 \mu\text{m}$ wide, rather short to medium-celled, evenly pale ochre to somewhat more incrustate and darker hyphae. Pileocystidia absent. Clamp connections numerous in all tissues.

Habitat: In fell fields and heaths, mostly growing on *Racomitrium*, and often in small fascicles of 1–3 specimens. This bryophilous species has been recorded from a wide variety of habitats (WATLING & GREGORY 1993), and grows according to J. FAVRE (1948) often peaty but never on *Sphagnum*.

Distribution: In Iceland collected only in the southern and northwestern parts, from about sea level and up to 420 m alt. The species has a wide distribution in the Northern Hemisphere occurring from temperate to arctic regions (cf. KÜHNER 1935, SMITH & SINGER 1964, GULDEN 1987).

Comments: SMITH & SINGER (1964) reported a very minute pore at spore apex (under oil immersion lens). In the present material (all collections) many or sometimes most spores had a strange, small, dark spot at apex, but a pore could not be discerned. In most books there is no mention of a pore in this species.

Galerina pumila often has minute veil remnants on the cap margin and in the lower part of the stipe. The lack of a plage is characteristic for the type variety of the species. As described and keyed out in WATLING & GREGORY (1993), *G. pumila* has a copious veil and spores with a faint plage outline. This is not in accordance with our concept of the type variety of the species. Also BON (1992) indicates a plage line and the shape of the illustrated spore is very different from the spores of our *G. pumila* (and his own description). *Galerina pumila* var. *subalpina*, as discussed below, has a plage and much paler and more amygdaliform spores.

Galerina pumila apparently is quite similar to *G. clavata* in the field (cf. SMITH & SINGER 1964, DIETRICHSON & HØYDAHL 1980), but these are very different in microscopic features. On the other hand, *G. vexans*, as described by SMITH & SINGER in 1955 seems to come very close to *G. pumila*, at least microscopically. Presence of gelatinised hyphae in the pileipellis might constitute a difference. In

two of our collections there appeared to be a thin layer of gelatinous hyphae, but all other characters were the same as in the rest of the material. It seems reasonable to consider further, when fresh material is at hand, the possibility that *G. vexans* is a later synonym of *G. pumila*.

LANGE (1949) recorded this species as *G. mycenopsis* from the Hekla area, growing in deep *Racomitrium*. Also the description of *G. mycenopsis* in LARSEN (1932) fits this species, but may include more taxa since he reported this to be common species among moss and grass in bogs, swamps, and wet tuffs.

16b. *Galerina pumila* (Pers. : Fr.) M. Lange var. *subalpina* A.H. Sm. - Fig. 8, 16b

Material examined: Snæfellsnessýsla: Sauraskógur, on moss, 0-40 m alt., 6 Sept. 1969, HH 6246 (AMNH).

Distinction: A pale *Galerina* with a somewhat thick, evenly coloured stipe. Microscopically the slender cheilocystidia and the pale, almost smooth spores are characteristic.

Gross-morphology (dry): Cap 1-1.2 cm wide, acutely umbonate, sulcate in marginal part, pale alutaceous, paler and almost cream at apex, thin-fleshed, margin incurved. Gills ascending, normally spaced, yellow brown (darker than cap and stipe) with white edge. Stipe 3-3.5 x 0.15-0.2 mm, hollow, polished, not fibrillose, apex apparently smooth (not pruinose), pale like the cap or paler. Veil not seen.

Microscopic characters: Basidia 4-spored, short, 24-28.8 x 8.4-12 μm , clavate. Spores 10.6-12.6(-13.5) x 6.8-7.7(-8.2) μm , $\text{Av}(10/1) = 11.9 \times 7.1 \mu\text{m}$, $Q = 1.6-1.9$, $Q_{\text{av}}(10) = 1.7$, amygdaliform, with distinct applanation above apiculus, pale ochre and minutely marbled in KOH, practically smooth, plage present and best seen as a hyaline, completely smooth area above apiculus in dorsal view, pore/callus absent, dextrinoid. Cheilocystidia numerous, 26.5-72 x 3-11 x 3-5 x 2-7 μm narrowly ventricose and flexuous, mostly with an irregular apical inflation, sometimes attenuated or mucronate; pleurocystidia absent. Hymenophoral trama of medium-celled, inflated, 5-30 μm wide, pale ochre hyphae (paler than spores). Pileipellis of radial, medium-celled, pale yellow almost hyaline hyphae, 4-12 μm wide. Stipitipellis of narrow, 3-5 μm wide, long-celled, pale ochre hyphae; caulocystidia few, more or less ventricose, sometimes slightly capitate. Clamp connections numerous in all tissues.

Ecology: Bryophilous.

Distribution: W Iceland.

Comments: In dry condition the specimens look very similar to those of var. *pumila*, being pale and with a relatively thick, hollow stipe. No veil remnants could be seen, although a fugacious veil is present in var. *subalpina* as well according to the original description. Also the cystidia are fairly much the same as in the type variety, possibly slightly more of the ventricose type. The spores, however, differ clearly in being

distinctly paler and distinctly amygdaliform, that is with an acute, not blunt apex. And there is no dark spot at apex as was seen in many of the spores of the type variety. Finally, the spores of *G. pumila* var. *subalpina* differ by presence of a plage.

Microscopically the material comes close to the material we have identified as *G. permixta* (see below). This is a brown and much darker *Galerina*, and the spores are slightly narrower.

New to Iceland.

17. *Galerina permixta* (P. D. Orton) Pegler & Young – Fig. 9,17

Material examined: Suður-Múlasýsla: Eyvindarárhólmar, Egilsstöðum, Aerodrome, 25-30 m alt., on wet soil with a little moss cover and *Salix phylicifolia* (regularly flooded in springtime), 21 Aug. 1987, HH 11352 (AMNH).

Distinction: Macroscopically the horizontal, (sub)distant gills and the rather dark colours are characteristic. Long, almost cylindric, flexuous and \pm capitate cheilocystidia and smooth, rather narrow spores distinguish the species.

Gross-morphology: Cap 0.7 - 1.3 cm, umbonate to hemispheric, margin striate, hygrophanous, moist (red) brown (h2), dry yellow brown (e3). Gills adnate, broad, \pm horizontal, distant, yellow brown (g7, h3) with paler edge. Stipe ca 2-3 cm tall, 1-1.5 mm thick, equal, minutely pruinose at apex, downwards somewhat shiny (and fibrillose); concolorous with the cap at apex, dark red brown below. Flesh yellow brownish. Smell absent.

Microscopic characters: Basidia 4-spored, 27.5 - 35 x 7.5-10 μm , clavate. Spores 10-12 x 5.5-6.5 μm , $Av(20/1) = 11.6 \times 6.1 \mu\text{m}$, $Q = 1.5-2.2$, $Q_{av}(20) = 1.8$, narrowly amygdaliform with distinct suprahilar applanation, pale yellow brown, dull yellow brown to slightly olive brown in KOH, smooth, plage present, faintly visible on the surface as a paler area delimited by a line, and as a minute hump on the outline, callus/pore absent, dextrinoid. Cheilocystidia rendering edge sterile, long, 35-70 x 6.3-7 x 2.5-5 x 5-9(-22.5) μm , mostly with a narrow ventral inflation and long necks, apices mostly inflated, clavate to globose or spear-head shaped, occasionally merely blunt or slightly fusoid, hyaline; pleurocystidia absent. Pileipellis of radial hyphae, 5-8 μm wide, rather short-celled and unevenly yellow brown incrustated, no gelatinous layer. Caulocystidia little differentiated, clavate to cylindric-capitate, ca 8-10 μm wide. Clamp connections numerous in all tissues.

Habitat: On wet, regularly flooded soil with some moss cover.

Distribution: We are not aware of previous records of this species from places outside the British Isles.

Comments: The description of the fresh material fits the description of *G. permixta* very well, although no veil is stated. However, there are distinct fibrils on the stipes of the dry specimens. The very heteromorph cystidia and the spore colour are quite characteristic. The spores are narrower in this species than in the other *Galerina*-species with smooth or practically smooth spores found in Iceland.

New to Iceland.

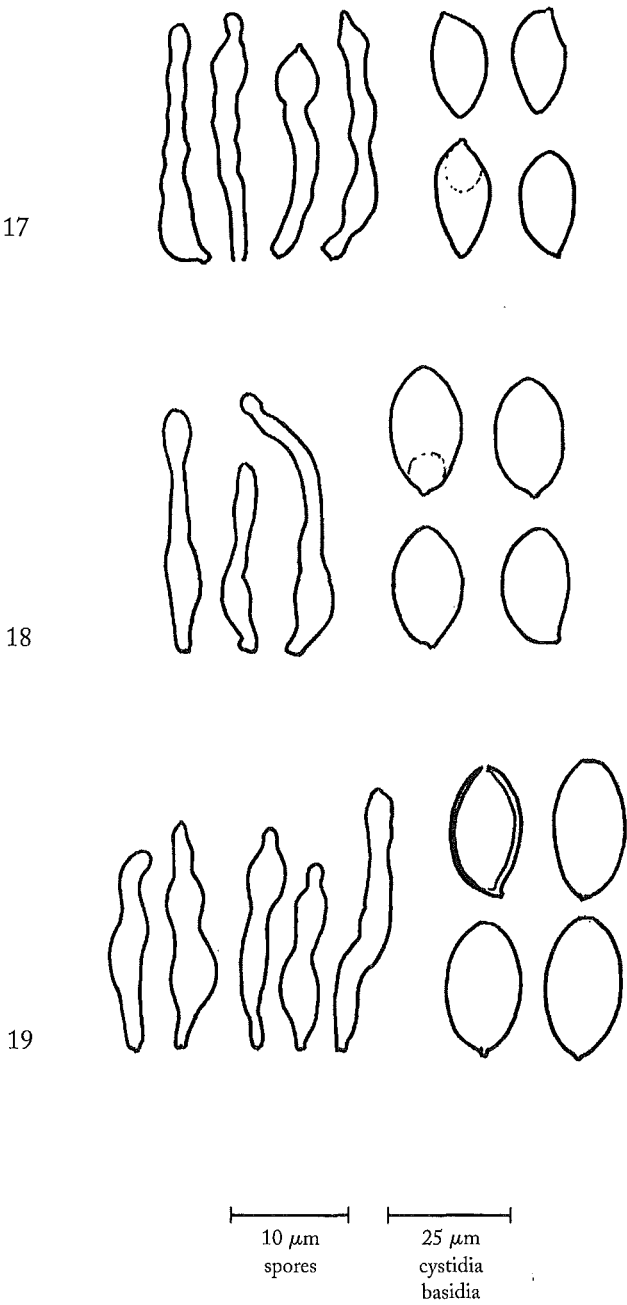


FIGURE 9. Spores and cheilocystidia. 9, 17. *Galerina permixta* HH 11352; 9, 18 *G. sphagnorum* HH 9399; 9, 19. *Phaeogalera stagnina* HH 11545.

18. *Galerina sphagnorum* (Pers. : Fr.) Kühner - Fig. 9, 18

Material examined: Eyjafjarðarsýsla: Varmavatnshólar, Öxnadal, 320-380 m alt., in wet moss, *Sphagnum* and others, 17. Aug. 1984, HH 9399 (AMNH).

Distinction: The habitat on *Sphagnum*, the smooth spores and the elongate-flexuous cystidia distinguish the species.

Gross-morphology: Cap (dry 0.5-1 cm), hygrophanous, moist dark brown to dark red brown, dry pale brown to yellow brown. Gills adnate, ventricose, pale brown with white edge. Stipe (dry 2.5-3.5 cm tall, 1 mm thick), white pruinose at apex, flesh brown with pale longitudinal fibrils in the lower part.

Microscopic characters: Basidia 4-spored, 31-35 x 9-10 μm . Spores (10-)10.6-12(-13) x 7-7.8 (-8.2) μm , $\text{Av}(10/1) = 11.1 \times 7.5 \mu\text{m}$, $Q = 1.4-1.7$, $Q_{\text{av}}(10) = 1.5$, amygdaliform to broadly amygdaliform, tawny in KOH, marbled, smooth, plage line faint, plage slightly paler than rest of the spore, no pore/callus. Cheilocystidia rendering edge sterile, long and flexuous, 25-68 x 5-12 x 3-5 x 2-8 μm , ventricose-cylindric to slightly capitate, ventral portion generally not much inflated; pleurocystidia absent. Hymenophoral trama of rather short-celled hyphae, 4-8 μm wide and brown zebra-incrusted. Pileipellis of radial, medium-celled, coarsely yellow brown, zebra-incrusted hyphae; no gelatinous hyphae. Clamp connections numerous in all tissues.

Habitat: Wet, among *Sphagnum* and other mosses.

Distribution: The species has a wide distribution in boreal and temperate regions of the Northern Hemisphere (Europe, North America, Siberia, Japan) according to SMITH & SINGER (1964) and HORAK (1993) and it also occurs in the warm areas in the south (Brazil). The species has been found in alpine fens in South Norway (GULDEN 1980) but according to HORAK (1993) the species is not common in cold climate regions.

Comments: Distinct, pale fibrils on the stipe, probably veil remnants, were noted in the fresh material (visible in the dry material as well). A veil is present but very fugacious in this species according to KÜHNER (1935, 1969), SMITH & SINGER (1964) and NOORDELOOS & GULDEN (1992). According to WATLING & GREGORY (1993) *G. sphagnorum* has no veil and no veil was observed in Norwegian alpine material (GULDEN 1980). Clearly the veil is fugacious and much less developed than in the somewhat similar *G. paludosa*, that may occur in the same kind of habitats. *Galerina paludosa* has more capitate cystidia than *G. sphagnorum*. Apparently the cystidia of *G. sphagnorum* may vary from rather regular and \pm ventricose-subcapitate to more cylindric and flexuous, as in our specimens. The spores in our material are somewhat larger than indicated by SMITH & SINGER (8-11 x 5-6.5 μm) but agree with those of material from Norway and the British Isles (GULDEN 1980, WATLING & GREGORY 1993).

New to Iceland.

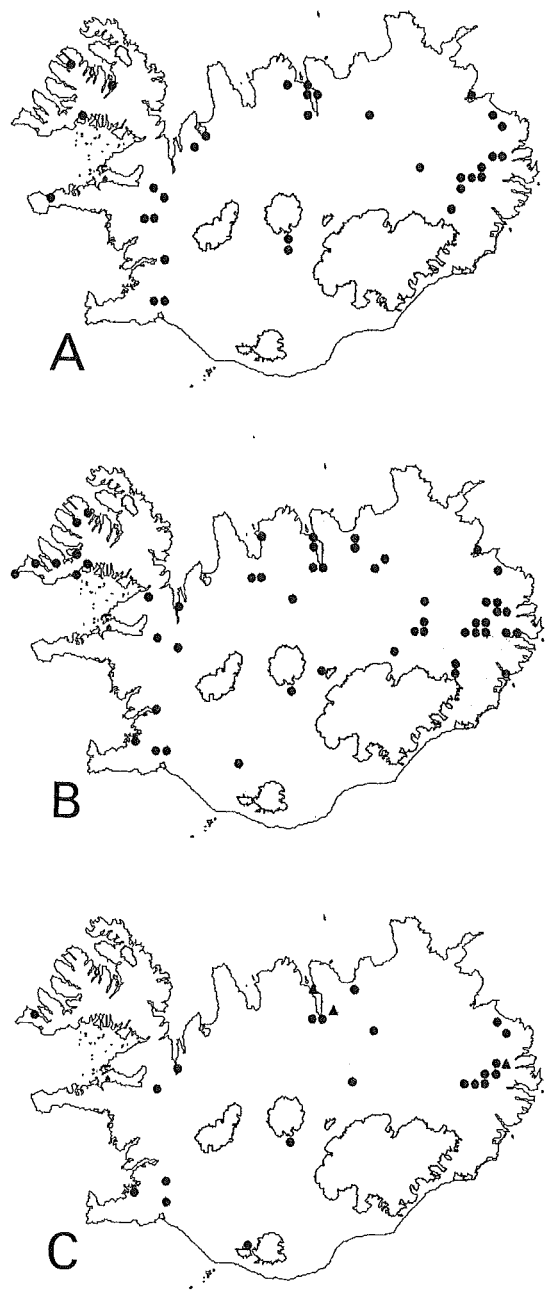


FIGURE 10. Distribution of A) *Galerina clavata*, B) *G. pseudomycenopsis* and C) *G. vittiformis* in Iceland, ▲ = *f. vittiformis*, ● = *f. tetraspora*.

Genus *PHAEOGALERA* Kühner

19. *Phaeogalera stagnina* (Fr.) Kühner ex Pegler & T. W. K. Young – Fig. 9, 19 and Fig. 2, 2

Material examined: Árnessýsla: Hveragerði, (Skólaselið), in deep moss, 50-100 m alt., 3 Aug. 1959, ML 301 (AMNH). Suður-Þingeyjarsýsla: Ýtri Neslönd at Mývatn, 3 Aug. 1993, GG 100/93 (O). Norður-Múlasýsla: Skriðuklaustur, Fljótsdal, 40-100 m alt., on shadowy side of ditch, in low moss, 6. Sept. 1987, HH 11545 (AMNH). Suður-Múlasýsla: Fjarðarheiði, 600 m alt., in moist moss at pond, 25 Aug. 1987, HH 11386 (AMNH). **Central Highland:** Nauthagi, Þjórsárver, *Mnium* sp., 590 m alt., 21 July 1971, H. Kristinsson 13759 and 13761 (AMNH).

Distinction: A dark red brown colour, a cap margin and/or stem apex with veil remnants, subdecurrent and rather distant gills are good field characters of the species, together with a moist habitat. Microscopically the truly smooth, ellipsoid spores with pore are distinctive.

Gross-morphology: Cap 1-2 cm, convex to umbonate, with downbent margin that often has veil remnants, translucently striate, smooth, fatty shiny, hygrophanous, moist dark red brown to red brown (c2,3, g8), drying patchily to yellow brown. Gills adnate with tooth, subdistant, edge white fimbriate, first yellow brown (h3, f8), then grey brown to cinnamon brown (h2). Stipe 3-9 cm tall, 1.7-2(-5) mm thick, fatty, ± white flocculose near apex, occasionally with an annulate zone, dark red brown to greyish red brown (c 2,3,4, f4) to yellow brown, paler at apex. Flesh red brown to pale brown in cap, darker in stipe. Smell rather prominent, sticky (reminding of *Tricholoma album*).

Microscopic characters: Basidia 4-spored, 32.5-45 x 7.5-12 μm , constricted, sterigmata narrow and curved. Spores 11.5-15.5 x (6-)7-9 μm , $Av(30/3) = 13.1 \times 7.9 \mu\text{m}$, $Q = 1.3-2.0$, $Q_{av}(30) = 1.7$, bluntly ellipsoid or slightly narrowing towards a ± truncate apex, yellow brown in KOH, smooth, plage absent, pore distinct, not dextrinoid. Cheilocystidia rendering edge sterile, 32-83 x 6-15 x 3-12 μm , narrowly ventricose to hyphoid, flexuous, often with several constrictions, tip fusoid, cylindric or somewhat inflated (not globose); pleurocystidia absent. Caulocystidia in nests, 27-75 μm long, similar to the cheilocystidia. Clamp connections numerous in all tissues.

Habitat: Among moss in moist to wet, swampy sites; on Iceland up to 600 m alt.

Distribution: Collected in most parts of Iceland, not yet in the western parts. World distribution: Arctic, subarctic, boreal and alpine regions of Europe and North America; also known from Subantarctica (HORÁK 1993).

Comment: CHRISTIANSEN (1941) recorded the species from Slúttnes at Mývatn as *Tubaria stagnina*.

EXCLUDED AND UNCERTAIN SPECIES

Galera hypnorum (Schrank.) Fr. recorded by ROSTRUP (1903) and cited by LARSEN (1932). There is no accompanying description, and in view of the formerly collective use of this name it is impossible to know which species is meant. Also LANGE (1949) recorded *G. hypnorum*, but added that the material was crippled and the identification dubious.

Galerina unicolor (Fr.) Singer recorded by HALLGRÍMSSON (1993) – see *G. pseudomycenopsis*.

Pholiota praticola F. H. Møller recorded by LANGE (1949) – see *G. pseudomycenopsis*.

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