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# The family Geoglossaceae in Iceland

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ABSTRACT: A survey is given of six species of the ascomycete family Geoglossaceae known to occur in Iceland. Three of the species, *Sarcoleotia globosa*, *Geoglossum arenarium* and *Geoglossum starbaeckii* are new to Iceland.

Members of Geoglossaceae were first recorded from Iceland by ROSTRUP 1903 (Islands Svampe, p. 317). He recorded two species: *Geoglossum glabrum* Pers. (Skriðdalur, East Iceland, leg. Th. Thoroddsen), and *Mitrula gracilis* Karst. (Grundarfjörður, Snæfellsnes, on moss, leg. Helgi Jónsson). LARSEN (1932) quotes these records in his comprehensive work, Fungi of Iceland, only adding a habitat to the former ("among grasses and mosses"). The specimens on which these records are based could not be found today, neither in Icelandic herbaria, nor in Botanisk Museum Copenhagen.

In the last twenty years, several specimens of Geoglossaceae have been collected in Iceland, by Hörður Kristinsson, Mikael Jeppson, Steen Elborne and the author, adding at least four new species to the flora. Johan Nitare has verified some of the identifications, and he also recorded *Geoglossum alpinum* from Iceland (NITARE 1984).

The specimens referred to in this article are kept in the Museum of Natural History, Akureyri, Iceland (AMNH), and in private collections of M. Jeppson and St. Elborne.

*MITRULA GRACILIS* Karst.

*Mitrula gracilis* was first recorded from Iceland by ROSTRUP (1903), in Grundarfjörður, West Iceland. Since 1960 it has been collected in several localities at Eyjafjörður (North Iceland) and in the Central Highland (fig. 1). It grows at an altitude from 200 (Árskógsströnd, Eyjafjörður) to 800 m (Mt. Hlíðarfjall, Eyjafjörður, and Sauðafellsháls (grid square 6450)), indicating alpine and northern distribution in Iceland.

The species was collected in the period from July 27th to Sept. 24th. It grows in small and rather dense clusters at the margin of springs and small brooks on wet mosses, often on *Palu-*

*della squarrosa*, *Philonotis tomentella*, *Homalothecium nitens*, *Calliergon* spp., *Drepanocladus* spp. and *Sphagnum* spp., commonly mixed with Hepatics.

Only in few instances did I notice brown patches of dead moss where *M. gracilis* grows. These were noticed in Hlíðarfjall near Akureyri at 600 m alt. on *Paludella squarrosa* (27th July 1966) and in the same locality at 450 m alt. on *Philonotis* spp. (Aug. 14th 1985). Such damages on mosses are frequently reported in the literature as caused by *M. gracilis* (ECKBLAD 1963, KANKAINEN 1969).

Conspicuous circles in the moss have also frequently been mentioned in the Central Highland of Iceland by travellers, usually supported by photographs, but without statement of the cause.

The Icelandic specimens of *M. gracilis* are very variable in the shape of the head, and colour, as is also reported from other northern countries (KANKAINEN 1969, p. 28). The "pileate" form is not uncommon in Iceland, and may occur in the same sample as the "capitate" form, which is more common, and this charachter can therefore hardly be used as a criterium for dividing the species, as pointed out by KANKAINEN.

The closely related *M. paludosa* Fr. seems to be absent in Iceland, since no specimens of *Mitrula* are known from its typical habitat. It is a lowland species in Scandinavia, with some tendency to coastal distribution, and should perhaps be looked for in South Iceland. It was reported from Greenland by M. LANGE 1957, but according to ECKBLAD (1963), these specimens belong to *M. gracilis*.

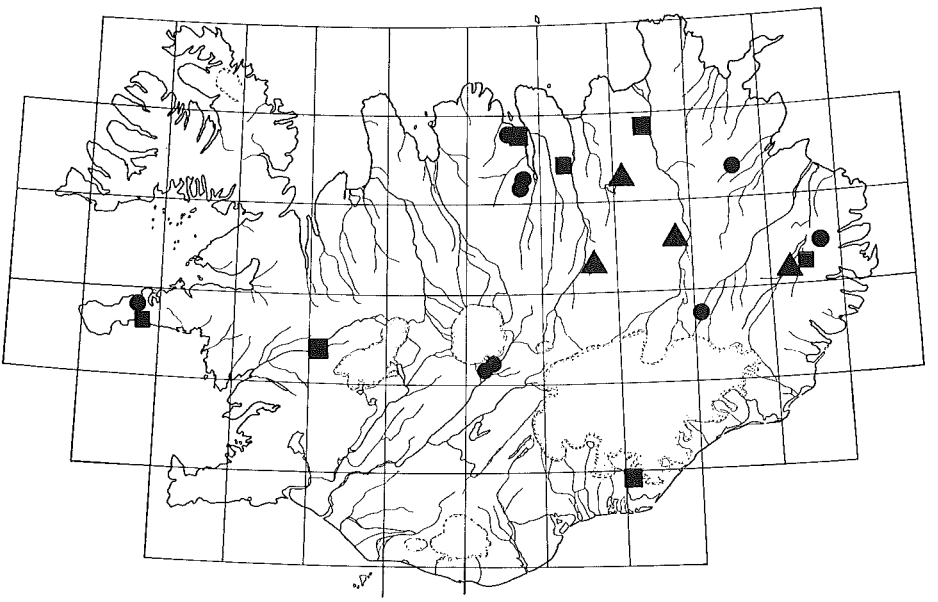

Fig. 1. Distribution of the species of Geoglossaceae in Iceland. ●: *Mitrula gracilis*, ▲: *Sarcoleotia globosa*; ■: The genus *Geoglossum*

*Mitrula gracilis* has a true arctic-alpine distribution. It is reported from Canada, Greenland, Jan Mayen, Spitzbergen, Northern Fennoscandia, Kola Peninsula, Japan, and from the Tatra Mountains and the Alps of Central Europe (KANKAINEN 1969).

*SARCOLEOTIA GLOBOSA* (Sommerf.) Korf. & J.K. Rogers.
*Corynetes globosus* (Sommerf.) Dur.

This species was described by SOMMERFELDT (1826, p. 287) from Saltdal in Finnmark, Norway. Three localities were added in Hördaland and Finnmark, (ECKBLAD 1963, p. 142). and it has also been reported from Arosa in the Alps at 1980 m alt. (RAHM 1975, p. 40). According to a letter from SIVERTSEN in Trondheim, Norway (1984), it has also been found in Sweden by J. Nitare, in Canada, and probably also in Greenland. Recently it was also found in Denmark (St. ELBORNE pers. information).

In Iceland *Sarcoleotia globosa* was first collected by Hörður Kristinsson in Grafarlönd, NE-Iceland at ca. 500 m alt. on sandy soil with low mosses (Aug. 24th, AMNH 8862). Two other specimens were collected by the author, one in Sandmúladalur (grid no. 5747), northern Central Highland at ca. 400 m alt., also on sandy soil with scanty, low mosses (Aug. 25th 1976, AMNH 9150), the other in Reykjahlíð, Mývatn at 300 alt. in mossy lava field with *Racomitrium canescens* and *Polytrichum piliferum* (August 17th 1985, AMNH 9990). The determinations of the specimens 8862 and 9150 have been verified by J. Nitare and S. Sivertsen. The species was also collected by Steen Elborne at Hallormsstaður, East-Iceland, at brookside in the wood, on mosses and hepatics (Aug. 10th 1984, SAE-55-ISL.), (ELBORNE pers. information).

The four collection sites for *S. globosa* in Iceland, are all situated in the northeastern region (fig. 1), where the climate is relatively continental. Soil erosion is heavy in this area and consequently the remaining soil is strongly contaminated with dust and fine sand. The altitude ranges from ca. 100 m (Hallormsstaður), to ca. 500 m (Grafarlönd). The Icelandic specimens are rather uniform, and appear typical as compared with the Norwegian material (ECKBLAD 1963, p. 144). The spores vary in size, but rarely exceed 20 µm.

From the known distribution of *S. globosa*, it must be considered an arctic-alpine species, with some tendence for continental climate and sandy habitats.

*GEOGLOSSUM ALPINUM* Eckblad

This species was established by ECKBLAD (1963), on the basis of specimens collected at Soleggen, Oppland, Norway in 1957. At present it is only known from two other localities in Norway.

In Iceland it was first collected by the author in Vesturdalur near Jökulsá á Fjöllum, NE-Iceland (grid no. 6139), on soil with low and scanty moss-growth, at 100-150 m alt. (Aug. 31st 1974, AMNH 9717). My determination was confirmed by J. Nitare 1983. He mentioned this specimen and also added a new locality, Skaftafell, SE-Iceland, collected by M.Jeppson. (NITARE 1984). Steen A. Elborne also collected this species in Skaftafell, among mosses with scattered *Betula*- and *Salix*-shrubs (Aug. 3rd, 1984, SAE-14-ISL.), and in Húsafellsskógur, W.-Iceland, two collections on soil and gravel, with sparse vegetation (Aug. 19th 1984, SAE-146A-ISL, and SAE-147-ISL). A specimen of *Geoglossum* collected

Fig. 2. *Geoglossum starbaeckii* (AMNH 8176) from Víkurbakki, Eyjafjörður.

Fig. 3. Ascospores from *Geoglossum starbaeckii* (AMNH 8176).

by Hörður Kristinsson at Langavatn, Snæfellsnes (grid no. 3051, Sept. 7th 1979) has been sent to J. Nitare and been identified as *G. alpinum* by him.

*G. alpinum* is apparently the most common *Geoglossum* species in Iceland, probably distributed throughout the country. At present it seems to be endemic to Iceland and Norway.

*GEOGLOSSUM ARENARIUM* (Rostr.) Lloyd.
*Corynetes arenarius* (Rostrup) Dur.

This species was described from Denmark (ROSTRUP 1892) and little later reported from Greenland by the same author (ROSTRUP 1892). It has since then been found in many northern countries around the world. In Scandinavia it has mainly been reported from coastal areas, but also from mountains in the north. As indicated by its name, *G. arenarium* is restricted to sandy habitats, and seems to be connected with *Empetrum*, and probably also with the fungus *Clavaria argillacea* (NITARE 1981 and 1982).

In Iceland it was found by Steen Elborne in Húsafellsskógur, West Iceland, ca. 200 m alt., growing on clayey soil in a lava field together with *G. alpinum* (Aug. 19th 1984, SAE-146B-ISL), (ELBORNE 1987, pers. information). It has not been found elsewhere in Iceland.

*GEOGLOSSUM STARBAECKII* Nannf.

This species was described by J. Nannfeldt from Sweden (NANNFELDT 1942). It is one of the commonest *Geoglossum* species in Scandinavia (ECKBLAD 1963 p. 148, and J. NITARE 1974 p. 82, fig. 15), often found in rather wet localities among mosses. In Iceland it was collected by the author at Víkurbakki, Eyjafjörður, N.-Iceland (Aug. 28th 1972, AMNH 8176). It was found on knolls in a mire, growing gregariously within a few square metres, among horse-tails, grasses and mosses. The specimens are 3-8 cm high, with spores 65-80 µm long, 9-15 septate. The determination was confirmed by J. Nitare.

*GEOGLOSSUM GLABRUM* Pers ex Fr.

As mentioned in the introduction, a species with this name was reported from Iceland by ROSTRUP 1903, referring to sample collected by Þorvaldur Thoroddsen in Skriðdalur, East-Iceland, growing "among grasses and mosses". The specimen is probably lost, since it is neither found in the Museum of Natural History in Reykjavík, nor in the Botanical Museum, Copenhagen.

The name *G. glabrum* Pers. was used in a wide sense, as a synonym with *G. ophioglossoides* (L.) Sacc. *G. glabrum* as now interpreted, is confined to moist habitats with *Sphagnum*, and is frequently reported as *G. sphagnophilum* Ehrenb. *Geoglossum cookeianum* Nannf. is another species of this complex, defined by J. Nannfeldt 1942, growing in dry and often sandy habitat. Both species are rather common in Scandinavia, the former also in the North. Two other species have been described in this group, *G. simile* Peck and *G. uliginosum* Hakel. It is difficult to say, to which of these species the sample collected by Thoroddsen belonged.

Hörður Kristinsson collected a *Geoglossum* at Stóru-Tjarnir, S.-Þingeyjarsýsla, N. Iceland (grid no. 5542), growing at the border of a small lake, alt. 300 m (Aug. 18th 1981). The speci-

mens were 5-7 cm long and up to 1 cm broad, dark brownish-black, with a long stipe. Paraphyses are of the glabrum-type, with distinctly swollen (often pyriform) apical cells, with dark granules. The Spores are 6-7 septate, dark brown or grey-brown, about 70 µm long. This sample has been sent to J. Nitare, and he has confirmed that this specimen belongs to *G. glabrum* (*sphagnophilum*).

From the records listed above we can conclude, that most of the Geoglossaceae seem to have a rather north-eastern distribution in Iceland, which in turn would indicate a continental trend, although *G. alpinum* at least is widely distributed. It must, however, be born in mind, that the northeastern region of Iceland has been more thoroughly investigated for fungi than other parts of the country.

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