

Enhanced key to Geoglossum-like fungi in Slovakia

Viktor Kučera, Pavel Lizoň, Nikola Rybáriková

Institute of Botany, SAS, Dúbravská cesta 9, 845 23 Bratislava, viktor.kucera@savba.sk



Geoglossum-like fungi are considered as rare fungi in most of European countries. Our extensive field research on these fungi both in non-forest and forest biotopes in Carpathians started in 2000 and resulted not only in discovery of ten new species for the region and solving some taxonomical problems but also in gathering of data on their distribution and ecology. According to our records common habitats for Geoglossum-like fungi are not peat-bogs and wet meadows (as frequently mentioned in publications) but grasslands; irregularly maintained meadows and pastures and their bushy margins seems to have the highest diversity of these fungi. Annual fruit-body production was even from the location of a collecting site and was influenced especially by rainfall. Geoglossum-like fungi are endangered mainly by changes in traditional farming of pastures and meadows and drainage of countryside.



Key for Trichoglossum

- A meadows, peat bogs, pastures, spores with 15 and more septa.....*T. hirsutum*
- more specific biotopes, spores with less than 15 septa.....*B*
- B growth in wet mown meadows, spores with more than 7 septa.....*T. variabile*
- spores with 7 septa.....*C*
- C growth on mesophilous occasionally grazed meadows, spores $> 100 \mu\text{m}$ long.....*T. octopartitum*
- growth on peat bogs, spores $< 100 \mu\text{m}$ long.....*T. walteri*

- ## Key for Geoglossum-like fungi in Slovakia
- 1 fruit-bodies black or dark brown, with setae in the hymenium and stipe.....key for *Trichoglossum*
 - Fruit-bodies dark brown, brown, green, olive, pinkish or different colour, without setae.....2
 - 2 fruit-bodies with pale colour, brown, green, olive, pinkish spores without septa, up to $25 \mu\text{m}$key for *Microglossum*
 - fruit-bodies dark coloured, at least fertile part black or brownish-black3
 - 3 stipe squamulose in upper part, spores hyaline without septa.....key for *Thuemenidium*
 - stipe viscid, squamulose or naked, spores brown or hyaline, distinctly septated.....key for *Geoglossum*



Key for Microglossum

- A fruit-bodies yellow-green or gray-green, stipe of fruit-body squamulose, mostly in forests.....*B*
- fruit-bodies pinkish, green, olivaceous, buff or ochraceous, stipe naked, mostly on meadows.....*C*
- B fruit-bodies yellow-green or olive-green, growing along cracks in wet acidic places, asci $105\text{--}135 \times 9.5\text{--}12 \mu\text{m}$, spores $18\text{--}22 \times 5\text{--}7 \mu\text{m}$*M. viride*
- fruit-bodies grayish-green, growing in deciduous forests, not specifically wet places, asci $105\text{--}140 \times 8\text{--}10 \mu\text{m}$, spores $16\text{--}20 \times 4\text{--}5 \mu\text{m}$*M. sp.1**
- C1 fruit-bodies green, stipe smooth, on neutral substrates.....*M. nudipes*
- C2 fruit-bodies pink, without other colour, on neutral substrates.....*M. fuscrobens*
- C3 fruit-bodies light brown, buff, without other colours, on slightly acidic places.....*M. olivaceum*
- C4 fruit-bodies olive, pinkish, greenish, mixed also on one fruitbody, in clusters, on calcareous substrates.....*M. rufescens*

Key for Thuemenidium

- A fertile part takes more than $\frac{1}{2}$ of fruit-body length, paraphyses slightly clavate, more or less curved at the apex.....*Th. robustum**
- B fertile part takes less than $\frac{1}{2}$ of fruit-body length, paraphyses straight, apex slightly thickened or swollen at the apex.....*Th. atropurpureum*



Key for Geoglossum

- A fruit-body viscid, at least on the stipe.....*B*
- fruit-body not viscid.....*D*
- B brown to dark brown, fertile part not sharply separated from the sterile part, apical cell of paraphyses pyriform, spore size $70\text{--}95 \times 4\text{--}5 \mu\text{m}$*G. glutinosum*
- dark brown to black, fertile part sharply separated from the sterile part, apical cells of paraphyses variously shaped or curved.....*C*
- C robust, up to 6 cm high, spores 7-septate, $60\text{--}80 \times 4.5\text{--}6 \mu\text{m}$*G. uliginosum*
- slender, up to 3 cm high, spores 14-septate, $90\text{--}120 \times 6\text{--}7 \mu\text{m}$*G. peckianum**
- D growing in peat bogs among *Sphagnum* spec. div., or very wet meadows.....*E*
- growing in different habitats.....*F*
- E apical cells of the paraphyses swollen up to $10 \mu\text{m}$, agglutinated with dark matrix, spores $66\text{--}82 \times 8 \mu\text{m}$*G. glabrum*
- apical cells of the paraphyses up to $8 \mu\text{m}$, not agglutinated with dark matrix, spores $75\text{--}100 \times 6.5\text{--}7.5 \mu\text{m}$*G. simile**
- F number of spores in the asci 6-8, spores 7-septate.....*G. montanum*
- number of spores in the asci 8.....*G*
- G spores hyaline, up to 14-septate.....*G. alveolatum*
- spores brown, 7-septate.....*H*
- H stipe smooth, fertile part compressed, lanceolate, fruitbodies black, paraphyses moniliform, spores $62\text{--}77 \times 5\text{--}6 \mu\text{m}$*G. cookeanum*
- stipe slightly rugose to squamulose, fertile part variously shaped, often with obtuse apex, fruit-bodies brown to black, paraphyses not moniliform.....*I*
- I fruit-bodies brown, silver-brown, blackish-brown, fertile part darker than the sterile, stipe squamulose mainly on upper part, spores up to 12-septate $65\text{--}95 \times 4\text{--}5 \mu\text{m}$, mostly on meadows.....*G. fallax*
- fruit-bodies dark brown to black, stipe slightly rugose, spores 7-septate $67\text{--}85 \times 5\text{--}6 \mu\text{m}$, meadows, forests.....*G. umbratile*



*Not published from Slovakia yet. Data were taken from collections and/or from Esteri Ohenoja paper (2000).

Eighteen species were identified in Slovakia until now: *Trichoglossum hirsutum* (26 localities), *T. walteri* (2 localities), *T. variabile* (2 localities), *T. octopartitum* (4 localities), *Geoglossum umbratile* (7 localities), *G. glutinosum* (5 localities), *G. glabrum* (4 localities), *G. fallax* (6 localities), *G. montanum* (1 locality), *G. cookeanum* (2 localities), *Geoglossum alveolatum* (1 locality), *Geoglossum uliginosum* (1 locality), *Thuemenidium atropurpureum* (2 locality), *Microglossum viride* (7 localities), *M. olivaceum* (4 localities), *M. fuscrobens* (1 locality), *M. rufescens* (1 locality) and *M. nudipes* (1 locality). The preliminary key for Geoglossum-like fungi introduces our taxonomic concept and assumed distribution in the Western Carpathians.

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