

The IUCN Red List of Threatened Species™ ISSN 2307-8235 (online) IUCN 2019: T147296771A147904382 Scope: Global Language: English

# Microglossum atropurpureum, Dark-purple Earthtongue

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**Citation:** Jordal, J. 2019. *Microglossum atropurpureum*. The IUCN Red List of Threatened Species 2019: e.T147296771A147904382. <u>http://dx.doi.org/10.2305/IUCN.UK.2019-</u> 2.RLTS.T147296771A147904382.en

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### Taxonomy

Kingdom	Phylum	Class	Order	Family
Fungi	Ascomycota	Geoglossomycetes	Geoglossales	Geoglossaceae

Taxon Name: Microglossum atropurpureum (Batsch) P. Karst.

### Synonym(s):

- Clavaria atropurpurea Batsch
- Geoglossum atropurpureum (Batsch) Pers.
- Microglossum atropurpureum (Pers.) Sacc

#### Common Name(s):

• English: Dark-purple Earthtongue

### Taxonomic Source(s):

Index Fungorum Partnership. 2019. Index Fungorum. Available at: http://www.indexfungorum.org.

#### **Taxonomic Notes:**

The name *Geoglossum atropurpureum* (Batsch) Pers. is used in many countries. Based on molecular data this is not a *Geoglossum*, it is not even in the new class Geoglossomycetes but in the Leotiomycetes (Ohenoja *et al.* 2010, Schoch *et al.* 2009, Hustad *et al.* 2013). The proper generic name still remains unclear (*Thuemenidium atropurpureum* (Pers.) Kuntze, or *Microglossum atropurpureum* (Pers.) Sacc.; Ohenoja *et al.* 2010, Hustad *et al.* 2013), but *Microglossum* is used here. The taxonomic status of GBIF occurrences in North America is uncertain but accepted here for the time being. Provisionally, a few occurrences from Japan and New Zealand are regarded as a probably related species.

### **Assessment Information**

Red List Category & Criteria:	Vulnerable A2c+3c+4c <u>ver 3.1</u>			
Year Published:	2019			
Date Assessed:	March 27, 2019			

### Justification:

In Europe *Microglossum atropurpureum* is a species of mainly calcareous seminatural grassland, mostly in the lowlands. These habitats are declining due to changing agricultural practices, development projects, mining and pollution (airborne nitrogen deposition). In North America the species mainly grows in forests, habitat trends here are unknown. GBIF lists about 1500 occurrences (under two names) of which about 100 in North America. In Europe we assume a total habitat loss of 30-50% over the last 50 years (approximately three generations: one generation is assumed to be about 17 years). Habitat quality has also become impaired and the decline in population size over this time could be even higher, strengthening an assumption of probably near 50%. This decline in habitat and populations is ongoing and expected to continue over the next 50 years. The species is assumed to have a population of more than 20,000 mature individuals. In Europe, the population decline is assumed to be 30-50% in 50 years (past, present and future). At a global scale (i.e. Europe + North America) the decline

is also assumed to be above 30% taking into account the much smaller population reported in North America (GBIF 2019). The species meets the threshold for VU (A2c+3c+4c) both globally and for Europe.

## **Geographic Range**

#### **Range Description:**

The species is known from Europe and North America. In Europe it occurs in many countries in the lowlands and rarely up to subalpine areas. The main distribution in Europe is in the northwestern, coastal areas. The eastern limit is uncertain due to lack of data. In Scandinavia the species is found most often in the southern parts of Norway and Sweden, up to southern to middle boreal vegetation zone, and rarely in the northern boreal zone. The species is mentioned from North America (e.g. Grund and Harrison 1967, GBIF 2019), Japan (Imai 1941, GBIF 2019) and New Zealand (GBIF 2019). There is need of molecular methods to confirm these data. Currently we accept the occurrence in North America, but regard the eastern occurrences as probably related species, like the situation in other earth tongues (see e.g. Hustad *et al.* 2013).

#### **Country Occurrence:**

**Native:** Austria; Belgium; Canada; Denmark; Estonia; Finland; France; Germany; Ireland; Netherlands; Norway; Poland; Slovakia; Slovenia; Spain; Sweden; Switzerland; United Kingdom; United States

#### Regionally extinct: Russian Federation

# **Distribution Map**

Microglossum atropurpureum



#### Range

Extant (resident)

Compiled by: IUCN





The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

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## Population

According to GBIF (2019) there are >1000 occurrences from Europe and <100 from North America. Based on available information on trends in European seminatural grasslands, Griffith et al. (2013) estimated a habitat loss of 90% over the last 75 years for the CHEG-fungi (grassland fungi of Clavariaceae, Hygrocybe s.l., Entoloma and Geoglossaceae) as a whole in Western Europe. A strong decline over 20 years is documented in Sweden (Nitare 1988). According to the Food and Agriculture Organization of the United Nations (FAO), the area of grasslands in the EU declined by 12.8% over 13 years (1990-2003). Also other sources point to a habitat loss in seminatural grasslands of roughly 1% per year in Europe over a longer time, although the data quality is not always very good. The habitat quality of seminatural grasslands is also declining, strengthening the population decline. More than 75% of the in habitats unfavourable grasslands are an conservation status (http://ec.europa.eu/environment/nature/knowledge/rep habitats/index en.htm#csa). This trend is ongoing and expected to continue in the future. A smaller amount of the European population occurs in calcareous forests with a lower decline in the same period, maybe 15-20%. The trend in North America is uncertain due to lack of data about the forest habitats there. The habitat loss in Europe is probably 30-50% in grasslands, and >30% in the total population. Over the whole distribution range (taking into account the part of the population in forest) we assume a total habitat loss and population decline of 30-50% over the last 50 years. This trend is ongoing and expected to continue in the future. Current Population Trend: Decreasing

### Habitat and Ecology (see Appendix for additional information)

The major population of *Microglossum atropurpureum* grows in mycologically rich but nutrient-poor semi-natural grasslands, often (but not always) on calcareous soil. Semi-natural grasslands are rapidly disappearing due to changes in land use (see Threats and Population). In Norway, most localities of the species are in semi-natural grasslands and rather few in rich/calcareous forests (N=235: 83.0% semi-natural grasslands, 10.2% rich forests, and the rest mainly in related grassland types like unmanured parks and lawns; Jordal *et al.* 2016), and similar patterns are found in other European countries. In North America it is known from different forest types, but little information is available. The nutrient strategy is unknown but it could have some kind of biotrophy or mycorrhiza, like waxcaps (Nitare 1988).

Systems: Terrestrial

### **Use and Trade**

The species is not known to be used.

### **Threats** (see Appendix for additional information)

Habitat destruction and abandonment are the main threats to seminatural grasslands including the calcareous ones. The most important process is probably overgrowing due to ceased grazing/mowing of old seminatural grasslands as part of intensification of agriculture. Further modern cultivation methods like use of fertilizers, pesticides and ploughing. Also in some places changed land use with the construction of roads, industrial areas, settlements etc. Airborne nitrogen deposition is another significant threat. The decline is expected to continue, as at least the areas of seminatural grasslands are of little economic importance in modern agriculture. Most CHEG grasslands (see Population) are among

types assessed as VU, EN or CR in the EU Red List of habitats (Janssen *et al.* 2016). Calcareous forests are also subject to decline at least in Europe. The threats in North America are unclear, in part due to uncertainty regarding its preferred habitats and their trends.

### **Conservation Actions** (see Appendix for additional information)

The habitats should be protected against destruction due to intensification of agriculture or development plans. The maintaining of seminatural grasslands demands yearly grazing or mowing. If grazing by heavy animals destroys part of the soil, light animals like sheep should be recommended. Habitat conservation by governmental support to traditional agricultural practices is most important, this exists in many countries to maintain extensive agricultural areas, and should be extended to larger areas than today. It is a category II protected species in Estonia. It is proposed as a priority species in Norway (Jordal 2013).

Further ecological research is needed to clarify the nutrient strategy of grassland earth tongues. Management plans are needed. Habitat trends should be monitored.

# Credits

Assessor(s): Jordal, J.

Reviewer(s): Ainsworth, A.M. & Mešić, A.

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### Citation

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### **External Resources**

For Images and External Links to Additional Information, please see the Red List website.

# Appendix

# Habitats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Habitat	Season	Suitability	Major Importance?
1. Forest -> 1.4. Forest - Temperate		Suitable	-
4. Grassland -> 4.4. Grassland - Temperate	-	Suitable	-

# Threats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Threat	Timing	Scope	Severity	Impact Score
1. Residential & commercial development -> 1.1. Housing & urban areas	Ongoing	-	-	-
1. Residential & commercial development -> 1.2. Commercial & industrial areas	Ongoing	-	-	-
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.3. Agro-industry grazing, ranching or farming	Ongoing	-	-	-
4. Transportation & service corridors -> 4.1. Roads & railroads	Ongoing	-	-	-
9. Pollution -> 9.5. Air-borne pollutants -> 9.5.1. Acid rain	Ongoing	-	-	-

# **Conservation Actions Needed**

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions Needed			
1. Land/water protection -> 1.1. Site/area protection			
1. Land/water protection -> 1.2. Resource & habitat protection			
2. Land/water management -> 2.1. Site/area management			
2. Land/water management -> 2.3. Habitat & natural process restoration			
4. Education & awareness -> 4.3. Awareness & communications			
6. Livelihood, economic & other incentives -> 6.4. Conservation payments			

# **Research Needed**

(http://www.iucnredlist.org/technical-documents/classification-schemes)

- **Research Needed**
- 1. Research -> 1.1. Taxonomy
- 1. Research -> 1.2. Population size, distribution & trends
- 1. Research -> 1.3. Life history & ecology
- 2. Conservation Planning -> 2.2. Area-based Management Plan
- 3. Monitoring -> 3.4. Habitat trends

# **Additional Data Fields**

### Habitats and Ecology

Generation Length (years): 17

### The IUCN Red List Partnership



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