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Scope: Global
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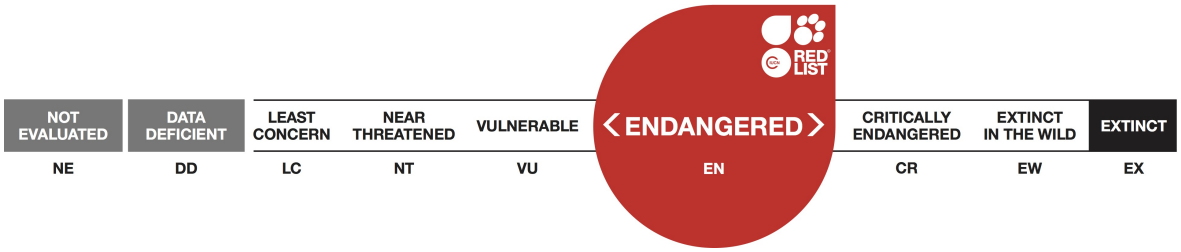
Gloioxanthomyces vitellinus

Assessment by: Jordal, J.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Fungi	Basidiomycota	Agaricomycetes	Agaricales	Not assigned

Taxon Name: *Gloioxanthomyces vitellinus* (Fr.) Lodge, Vizzini, Ercole & Boertm.

Synonym(s):

- *Hygrocybe luteolaeta* Arnolds
- *Hygrocybe vitellina* (Fr.) P. Karst.
- *Hygrophorus vitellinus* Fr.

Taxonomic Source(s):

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

Taxonomic Notes:

Gloioxanthomyces vitellinus (Fr.) Lodge, Vizzini, Ercole & Boertm. is a European species which belongs in the new genus *Gloioxanthomyces*, close to the N American species *G. nitidus* (Lodge *et al*. 2013). There is an epitype selected from Sweden (Lodge *et al*. 2013, *cf.* Bergelin 2012). GBIF occurrences of *G. vitellinus* in N America should be *G. nitidum*, and other non-European occurrences in GBIF are also doubtful (cf. Lodge *et al*. 2013), and will not be further treated here. In some European countries there is probably confusion with *Chromosera (Hygrocybe) citrinopallida* (A.H. Sm. & Hesler) Vizzini & Ercole which is mostly an alpine species; this species e.g. lack a viscid/slimy lamellae edge and has completely different spores (Boertmann 1990). The central European interpretation of *H. vitellina* is apparently sometimes *Hygrocybe ceracea* (Boertmann 2010).

Assessment Information

Red List Category & Criteria: Endangered A2c+3d+4c ver 3.1

Year Published: 2019

Date Assessed: March 26, 2019

Justification:

Gloioxanthomyces vitellinus is a European species growing mainly in seminatural grasslands, mostly in lowlands near the coasts (an oceanic species). The habitat is strongly declining due to changing agricultural practices, development projects and pollution. We assume a total habitat loss of more than 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 the assumption of a population decline of >50%. This decline in habitat is ongoing and expected to continue over the next 50 years. The loss and deterioration of grassland habitats within this species' oceanic range is expected to be even higher than the average for these grassland habitats in Europe. GBIF (2019) lists about 500 occurrences. The species is assumed to have a population of more than 20,000 mature individuals. At a global scale (i.e. Europe) the decline is assumed to be on average >50% in 50 years (past, present and future). The species meets the threshold for EN (A2c+3c+4c).

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Geographic Range

Range Description:

Non-European occurrences are excluded (see Taxonomic notes). The largest populations are in northwest Europe (especially UK, Netherlands, Germany, Sweden, Denmark and Norway) and with more scattered occurrences in the rest of western and central Europe. The absence from Finland and most of eastern Europe, and the high frequency in North Sea areas, suggest an oceanic distribution (mild winters and humid climate). The species has a striking coastal distribution in western Norway, in areas where January-February mean temperatures are >-1°C (Jordal and Gaarder 2002, Wollan *et al*. 2008). This is consistent with the occurrence in the outermost southwest coast of Sweden (Bergelin 2012), also consistent with a January mean temperature >-1°C. The coastal distribution could be caused by frost intolerance (Jordal and Gaarder 2002). The eastern boundary of distribution is not clear due to lack of data. Confusion with *Chromosera citrinopallida* or *Hygrocybe ceracea* can possibly explain GBIF occurrences in some inland/alpine/continental parts of Europe. Information from some countries and localities should therefore be verified by microscopy or by DNA.

Country Occurrence:

Native: Denmark; Germany; Ireland; Netherlands; Norway; Poland; Sweden; United Kingdom

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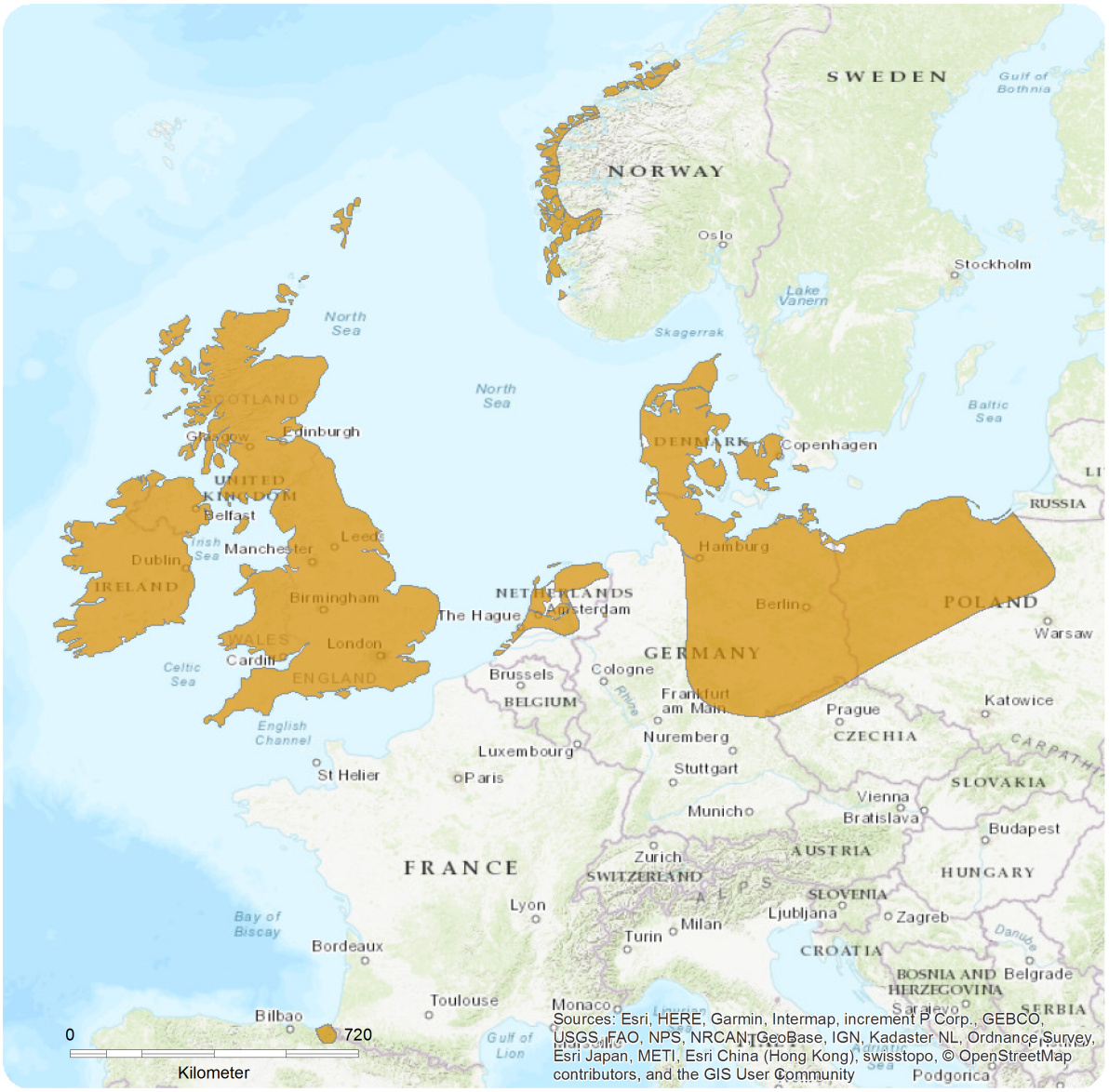
Distribution Map

Gloioxanthomyces vitellinus



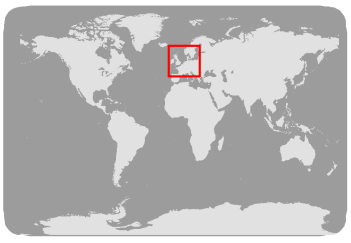
Range

Extant (resident)

Compiled by:

IUCN

NE DD LC NT VU EN ENDANGERED CR EW EX



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

GBIF (2019) lists about 500 occurrences, which is probably too many due to confusion with other species. The total population probably exceeds 20,000 mature individuals but is decreasing in all known countries of occurrence, caused by disappearance of small scale farming and traditional ways of grassland management, especially in coast/lowland areas. Griffith *et al*. (2013) estimated a habitat loss of 90% over the last 75 years for the CHEG-fungi (grassland fungi of the groups Clavariaceae, *Hygrocybe s.l.*, *Entoloma* and Geoglossaceae) as a whole in Western Europe (i.e. loss in seminatural grasslands, based on available information). According to the Food and Agriculture Organization of the United Nations (FAO 2006), the area of grasslands in the EU declined by 12.8% over 13 years (1990-2003). The habitat quality of seminatural grasslands is also declining, strengthening the population decline. More than 75% of the grassland habitats are in an unfavourable conservation status (http://ec.europa. eu/environment/nature/knowledge/ rep_habitats/index_en.htm#csa). Since the species occurs in the coastal/lowland parts of Europe, we assume a total population decline for the species of >50% over the last 50 years (3 generations for this species). This trend is expected to continue in the future.

Current Population Trend: Decreasing

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

Gloioxanthomyces vitellinus is an indicator of mycologically rich but nutrient-poor, semi-natural grassland (a member of the waxcap grassland assemblage), often on acid soil. This habitat, which may be of low conservation concern for its plant and animal diversity, is rapidly disappearing due to changes in land use (see Threats). In Norway, most localities of the species are in seminatural grasslands or grassy/mossy spots in coastal *Calluna* heath (N=74; 90.5% in seminatural grasslands, only 1.4% in forests; Jordal *et al*. 2016), and similar patterns are found in other countries. Boertmann (2010) also mentions occurrences in fixed dunes, moist soil in *Salix* scrubs and once in a forest bog. Waxcaps are currently regarded as forming a biotrophic relationship with plants but the details remain unclear (Halbwachs *et al*. 2018). The fruit bodies are short-lived (weeks), but the mycelium is suspected to be longlived; >50-100 years.

Systems: Terrestrial

Use and Trade

The species is not known to be used.

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

Habitat destruction and abandoning are the main threats to seminatural grasslands. 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. Airborne nitrogen deposition is another significant threat. Also in some places changed land use with the construction of roads, industrial areas, settlements etc. Decline is expected to continue, as the areas of seminatural grasslands are of little economic importance in modern agriculture. Most waxcap grasslands are among habitat types Red Listed as VU, EN or CR in the EU Red List of habitats (Jansen *et al*. 2016). The quality of habitats is also decreasing. More than 75% of the grassland habitats in EU are in an unfavourable conservation status, according to draft data provided by Member States

under Article 17 of the Habitats Directive.

Conservation Actions (see Appendix for additional information)

Site protection and management of habitats are very important conservation actions. 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.

Further ecological research is needed to clarify the nutrient strategy of waxcaps. 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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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?
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	-	-	-
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
2. Land/water management -> 2.1. Site/area management
2. Land/water management -> 2.3. Habitat & natural process restoration
6. Livelihood, economic & other incentives -> 6.4. Conservation payments

Research Needed

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

Research Needed
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
2. Conservation Planning -> 2.2. Area-based Management Plan

Research Needed
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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