

## ***Genea lobulata*, A New Hypogeous Ascomycete Record for Turkish Mycobiota**

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**Abstract:** The hypogeous ascomycete species *Genea lobulata* is given as new record for the mycobiota of Turkey based on the collections from Ulukışla district of Niğde province. General descriptive characteristics of the species is summarized, and macroscopic photographs of fresh specimens and microscopic images obtained from dried specimens were provided.

## ***Genea lobulata*, Türkiye Mikobiyotası İçin Yeni Bir Toprak Altı Askomiset Kaydı**

### **Anahtar Kelimeler**

Biyocoşkitlilik,  
Toprak altı mantarlar,  
Makromantarlar,  
Yeni kayıt,  
Taksonomi

**Özet:** Toprakaltı askomiset türü olan *Genea lobulata* Niğde'nin Ulukışla ilçesinden toplanan örneklerle dayalı olarak Türkiye için yeni kayıt olarak verilmiştir. Türün genel betimleyici özellikleri özetlenmiş ve taze örneklerin makroskobik fotoğrafları ve kuru örneklerden elde edilen mikroskobik görüntüler verilmiştir.

### **1. Introduction**

*Genea* Vittad. is a hypogeous ascomycete genus in the family Pyronemataceae [1]. It was first proposed by Carlo Vittadini [2] and considered as the type genus of the family Geneaceae until it was transferred to the Pyronemataceae on the basis of morphological and molecular evidence [3]. The members of the genus are characterized by hypogeous, subglobose to more or less lobed or irregular, apically orificed, hollow, simple or convolutedly chambered ascumata with a brownish to black and usually conspicuously verrucous surface; cylindrical or narrowly clavate, short-stipitate, 8-spored, indehiscent, inamyloid, thin-walled asci; cylindrical, septate and somewhat inflated paraphyses; and ellipsoid to subglobose, hyaline or pale yellowish ascospores with large, rounded or conical to crested warty ornaments [3-6].

Index fungorum (accessed on 5 May 2019) lists 39 conformed species of the genus, but only four of them, *Genea hispidula* Berk. ex Tul. & C. Tul., *G. klotzschii* Berk. & Broome, *G. sphaerica* Tul. & C. Tul. and *G. verrucosa* Vittad., have so far been reported from Turkey [7-9].

Here we present *G. lobulata* (Mor.-Arr., J.Gómez & Calonge) P.Alvarado & Mor.-Arr. as a new member of the genus in Turkey, based on the samples collected from Ulukışla district of Niğde province. According to

the current checklists [10, 11] on Turkish macromycota and the presented contributions about hypogeous taxa, after the publication of these checklists [12-14], *G. lobulata* has not been reported from Turkey before. The study aims to contribute to the mycobiota of Turkey.

### **2. Material and Method**

Fruit bodies of *G. lobulata* were collected from Ulukışla district of Niğde province during field studies performed in 2018. They were photographed at their natural habitats and the observed ecologic and morphologic parameters related to fruit bodies were recorded. The samples were dried and prepared as fungarium materials, after they were transferred to the laboratory. Microscopic investigations are based on dry samples. Micromorphologic data were obtained by using a Nikon eclipse Ci trinocular light microscope and a DS-Fi2 digital camera, and photographed by a Nikon DS-L3 displaying apparatus. The samples were identified by comparing the obtained macro and micromorphologic data with Moreno-Arroyo et al. [15], Alvarado et al., [3, 6], and Kaounas et al., [16] The samples are kept at Karamanoğlu Mehmetbey University, Kâmil Özdağ Science Faculty, Department of Biology.

### 3. Results

Sytematic of the taxa is in accordance with speciesfungorum.org (accessed on 5 May 2019).

*Ascomycota* Caval.-Sm.

*Pezizomycetes* O.E. Erikss. & Winka

*Pezizales* J. Schröt.

*Pyronemataceae* Corda

*Genea* Vittad.

*Genea lobulata* (Mor.-Arr., J. Gómez & Calonge) P. Alvarado & Mor.-Arr.

**Syn:** [*Genea sphaerica* f. *lobulata* Mor.-Arr., J. Gómez & Calonge]

**Macroscopic and microscopic features:** Ascomata 15-35 mm in diameter, hypogeous, subglobose to lobed with an irregular apical opening. Peridium 350-450  $\mu\text{m}$  in thickness and composed of two layers. External layer has a pseudoparenchymatic structure with a thickness of about 250-300  $\mu\text{m}$ , and covered with black, polygonal flat warts, without peridial hairs. Inner pseudoparenchymatic layer of 150-200  $\mu\text{m}$  wide tends to prosenchymatic structure towards the hymenium. Gleba consists of a large number of folds of the wall, with a cerebriform appearance. Hymenial surface brownish to dark-brownish or black, somewhat warty (Figure 1). Asci 195-220  $\times$  24-27  $\mu\text{m}$ , cylindrical, eight-spored (Figure 2a,b). Paraphyses, cylindrical, septate, up to 8-10  $\mu\text{m}$ , somewhat longer than asci (Figure 2c). Ascospores 24-29  $\times$  21-25  $\mu\text{m}$ , subglobose to ellipsoid, densely ornamented with spiny warts or thorns of 1-2  $\mu\text{m}$  high (Figure 2d,e).

**Ecology:** *Genea lobulata* was reported to grow under *Quercus ilex* L. and *Q. faginea* during winter, spring and summer [6, 15, 16].

**Specimen examined:** Niğde, Ulukışla, Yeniöldüz Village, in soil under *Quercus infectoria* Olivier, 37°27'N-34°23'E, 1600 m, 16.04.2018, O. Ber-167.

### 4. Discussion and Conclusion

*Genea lobulata* was added to the Turkish mycobiota as the fifth member of the genus *Genea*. General characteristics of the investigated Turkish collection are in agreement with those presented by Moreno-Arroyo et al. [15] and Kaounas et al. [16]. Both Moreno-Arroyo et al. [15] and Kaounas et al. [16] mentioned collections under *Q. ilex*, but our sample was collected under *Q. infectoria*.

Though Trappe et al. [5] mentions about this species to be a common one, *G. lobulata* was reported from several countries and seems to have a Mediterranean distribution [6, 15]. Until it was raised to species status by Alvarado et al. [6], it was regarded as a forma of *G. sphaerica* Tul. & C. Tul [16].



Figure 1. Ascocarps of *Genea lobulata*

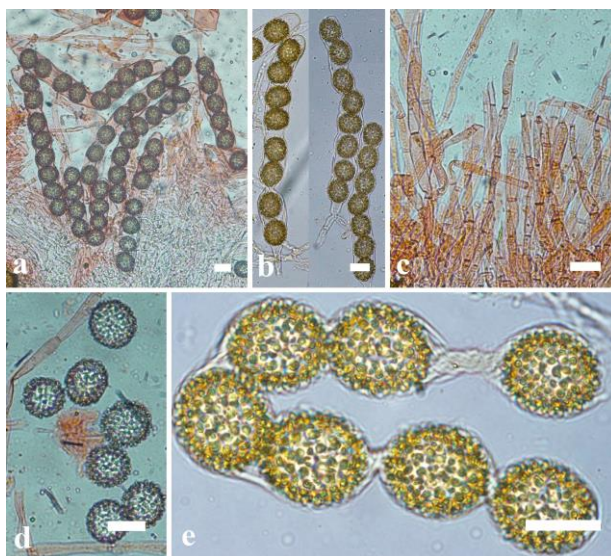


Figure 2. Asci and paraphyses (a), asci (b) paraphyses (c) and ascospores (d,e) of *Genea lobulata* (a,c,d in Congo-Red; b,e in Melzer)

Naturally *G. sphaerica* is the most similar species to *G. lobulata*. But the minutely warted external peridium, bigger, often irregularly lobed and generally not symmetric ascomata, spore ornaments of spiny-tuberculate warts instead of round warts, and growth of it only under *Quercus* L. spp., instead of *Carpinus* L., *Corlylus* L., *Fagus* L. and *Tilia* L., differs it from *G. sphaerica*. *Genea cephalonicae* Kaounas, Agnello & P. Alvarado and *Genea lespiaultii* Corda, also resemble *G. lobulata*. However *G. cephalonicae* differs from *G. lobulata* with spore ornamentation of rounded, truncated and rarely digitate longer warts of 3-5(-6)  $\mu\text{m}$ , and *G. lespiaultii* differs with its distinctive flat warty spore ornamentation [6].

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