
Terfezia morenoi

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Terfezia morenoi Bordallo, Ant. Rodr. & Morte, *sp. nov.*

Etymology. Named after Prof. Gabriel Moreno, from Universidad de Alcalá de Henares (Madrid, Spain), for his long and illustrious career in Spanish Mycology and his outstanding contribution to the knowledge of hypogeous fungi.

Classification — *Pezizaceae, Pezizales, Pezizomycetes*.

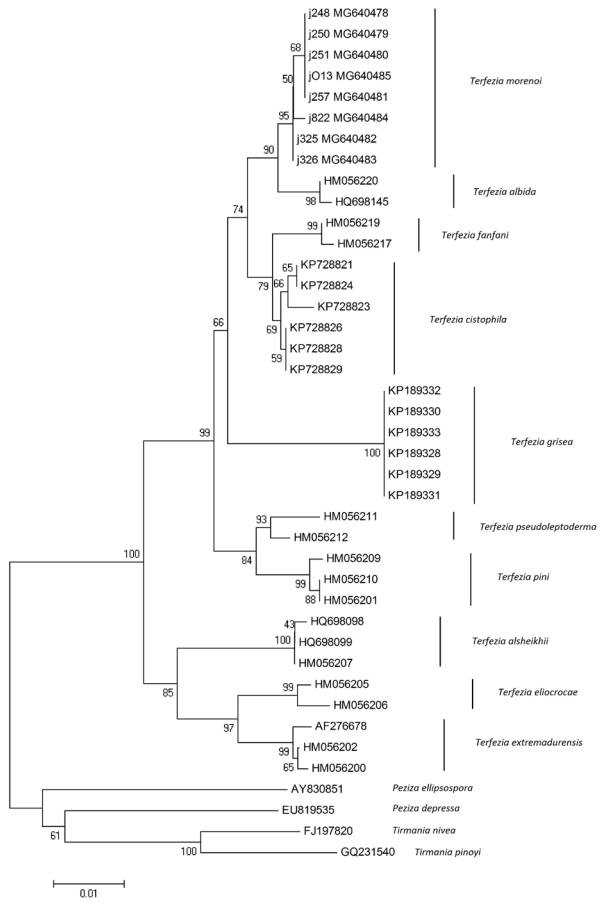
Ascomata hypogeous to partially emergent at maturity, 2–5 cm in size, subglobose, short base, cream colour at first, becoming brown, black spots on the sun-exposed parts or when manipulated, smooth. *Peridium* 300–500 µm thick, whitish in cross section, pseudoparenchymatous, composed of subglobose cells, 20–50 µm diam, thin-walled, hyaline, yellowish and angular to oblong in the outermost layers. *Gleba* solid, fleshy, succulent, whitish with small pale grey pockets at first, maturing to greyish green pockets of fertile tissue separated by whitish, sometimes with salmon pink spots, sterile veins. Often with small holes indicating mycophagous activity. Strong *odour*, more remarkable in mature specimens becoming unpleasant. Mild *taste*. *Asci* nonamyloid, ellipsoid to ovate, citriform, sessile or short-stipitate, 60–90 × 50–60 µm, walls 1–2 µm thick, with 6–8 irregularly disposed spores, randomly arranged in fertile pockets. *Ascospores* globose, (16–)16.5–19(–19.5) µm diam (median = 18 µm) including ornamentation, (13.5–)14–16 (–16.5) µm (median = 15 µm) without ornamentation, hyaline, smooth and uni-guttulate at first, by maturity yellow ochre and ornamented with conical spines, pointed, straight, separate, 1–2(–2.5) µm long, 1 µm wide at the base.

Ecology & Distribution — *Terfezia morenoi* grows in calcareous, clayey, alkaline soils, associated with *Pinus* spp. and *Quercus ilex*, with no presence of *Cistaceae*, it fructifies from March to April. A circular brûlé or burnt area, with scanty vegetation, is usually observed in the ground around its mycorrhizal host plant. This burnt area is very similar to those described for some *Tuber* species and can be widely interpreted as allelopathic phenomena due to volatile secondary metabolites emitted in the course of their life cycle (Streiblova et al. 2012). The fact that this species has a strong odour could be related to the formation of this burnt area, not found in other *Terfezia* species with light spermatic odour or without odour.

Typus. Spain, Albacete, Jorquera, 2013, leg. *Ant. Rodríguez* (holotype MUB Fung-j251, ITS sequence GenBank KY678905, MycoBank MB823725).

Additional material examined. Spain, Albacete, Cilleruelo, 2009, *A. Rodríguez*, MUB Fung-jO12, MUB Fung-jO13, MUB Fung-jO14; Pozohondo, 2013, *A. Rodríguez*, MUB Fung-j257; Lezuza, 2017, *A. Rodríguez*, MUB Fung-j822; Jorquera, 2013, *C. Rodríguez*, MUB Fung-j248, MUB Fung-j250, MUB Fung-j251; Valencia, Onteniente, 2009, *A. Rodríguez*, MUB Fung-jO39; La Rioja, 2013, *A. Rodríguez*, MUB Fung-j325, MUB Fung-j326; Valladolid, Santa Espina, 1998, *A. García*, MUB Fung-jO34.

Notes — *Terfezia morenoi* is a spiny-spored *Terfezia* species characterised by its strong odour attractive for animals, greyish green gleba, growing in alkaline clay soils in spring, associated with *Pinus* spp. and *Quercus ilex* without presence of *Cistaceae*. It differs from *T. albida*, the other spiny-spored species growing in alkaline clay soils in having a spermatic odour, white peridium, larger spores and different host plant (Bordallo et al. 2013). *Terfezia cistophila* has a spermatic odour, different host and grows in acidic soil (Bordallo et al. 2015). *Terfezia olbiensis* is odourless and grows in winter (Tulasne & Tulasne 1851). *Terfezia grisea* is odourless, has blackish grey gleba and different host plant (Bordallo et al. 2015). *Terfezia fanfani*, *T. pseudoleptoderma*, *T. extremadurensis*, *T. pini* and *T. leptoderma*, the other spiny-spored species, differ in growing in acidic soil, having no distinctive odour and larger spores. Moreover, the new taxon is distinguished from the other species based on ITS sequence identity in the phylogenetic tree based on the Neighbour-Joining method, that was topologically identical to the Maximal Parsimony tree (data not shown).



The evolutionary history was inferred using the Neighbour-Joining method. The bootstrap consensus tree inferred from 500 replicates is taken to represent the evolutionary history of the taxa analysed. Branches corresponding to partitions reproduced in less than 50 % bootstrap replicates are collapsed. The percentage of replicate trees in which the associated taxa clustered together in the bootstrap test (500 replicates) are shown next to the branches. The tree is drawn to scale, with branch lengths in the same units as those of the evolutionary distances used to infer the phylogenetic tree. The evolutionary distances were computed using the Maximum Composite Likelihood method and are in the units of the number of base substitutions per site. All positions containing gaps and missing data were eliminated from the dataset (Complete deletion option). There were a total of 452 positions in the final dataset. Phylogenetic analyses were conducted in MEGA4 (Tamura et al. 2007).

Colour illustrations. Habitat with *Pinus halepensis* and a burnt area around; ascocarp; gleba and mature ascospores. Scale bar = 10 µm.

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