Two *Peziza* taxa (*Peziza proteana* f. *proteana* (Boud.) Seaver and *Peziza proteana* f. *sparassoides* (Boud.) Korf) new to Iraq and bordering countries

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The present study reports two *Peziza* taxa (Pezizaceae/Ascomycota) collected from Al-Alam province in Salahadine Governorate, North Central Iraq, namely, *Peziza proteana* f. *proteana* and *P. proteana* f. *sparassoides*. Both taxa are reported for the first time from Iraq and for the second time from Asia (including countries bordering Iraq). These two forms of *P. proteana* are very similar microscopically but deviate macroscopically and both are very rare in the study area. Habit, habitat, macroscopic and microscopic features and season of fruit body appearance of the two taxa are presented.

Key words: *Peziza*, *Peziza proteana* f. *proteana*, *Peziza proteana* f. *sparassoides*, Iraq.

INTRODUCTION

*Peziza* Dill. ex Fri., the type genus of the family Pezizaceae (Norman and Egger, 1999), is the largest genus in this family with 80 to 104 macrofungal species (Korf, 1972; Hawksworth et al., 1995; Spooner, 2001; Kirk et al., 2008) that grow on all types of soil (sand, clay or limestone), rotting wood, burnt ground and dung (Petersen, 1985; Hansen et al., 2001; Barseghyan and Wasser, 2011; Beug et al., 2014). This genus is generally characterized by epigeous, sessile or stipitate, cupulate, turbinate, pulvinate or sparassoid apothecia which range in size from a few millimeters to more than 10 cm in diameter (Hansen et al., 2001; Barseghyan and Wasser, 2011). Members of the genus are considered to be saprotrophs but only a few species are claimed to be mycorrhizal (Maia et al., 1996; Hansen et al., 2001; Barseghyan and Wasser, 2011). This taxonomically complex genus has been well studied in Europe and countries of North and South America but has not given similar attention in Africa, Asia and Australia (Barseghyan and Wasser, 2011). Among Pezizaceae taxa, *Peziza proteana* (Boud.) Seaver is the only species in this family that shows both cupulate (or cup shaped) apothecium, formed by the taxon *P. proteana* f. *proteana* (Boud.) Seaver and sparassoid (or cabbage head like) apothecium formed by the taxon *P. proteana* f. *sparassoides* (Boud.) Korf (Korf, 1973; Beug et al., 2014). The term sparassoid is derived from the name of the basidiomycetous genus *Sparassis* (Korf, 1973). No information is available on *P. proteana* from Iraq and its adjacent countries.

Al-Alam province (34°38′41″N 43°42′0″/elevation 96 m) of Tikrit district in Salahaddin Governorate, North Central Iraq is located on the Tigris River, about 140 km Northwest of Baghdad, the capital of Iraq. This province is rich in vegetation, comprising different tree species (poplar, willow, pine and several fruit tree species) with...
many species of shrubs and herbs. The province is expected to harbour a wide variety of macrofungal species. However, Al-Alam area is still unexplored from macrofungal point of view. During field research in this province, two ascomycetous macrofungi samples were collected and identified as *P. proteana f. proteana* and *P. proteana f. sparassoides*. Both taxa are new to Iraq and bordering countries. In this paper, habit, habitat, macro and microscopic features and season of fruit body appearance of the two *Peziza* taxa are presented.

**MATERIALS AND METHODS**

Macrofungi samples were collected from different sites within AL-Alam province during March to July, 2017. Habit (solitary, gregarious or other growth forms), habitat (host or substratum), macroscopic (features like fruit body size, shape and color, texture of inner and outer surfaces and flesh color) and microscopic features (like ascus size, shape, no. of spores and staining, paraphyses size and shape, spores size, shape and color) and season of fruit body appearance of the samples were recorded. Samples were photographed in their natural habitat and in the laboratory. Cotton blue in lactophenol, IKI and KOH (10%) were used during the study. Macrofungi samples were identified according to relevant references (Smith, 1975; Hansen et al., 2001; Barseghyan and Wasser, 2007, 2011; Beug et al., 2014; Spooner, 2001). The examined samples were deposited in Department of Biology, College of Education for Pure Sciences, Tikrit University, Iraq.

**RESULTS AND DISCUSSION**

*P. proteana f. proteana*

Figure 1 shows the macroscopic and microscopic
features as follows:

**Macroscopic features:** Fruit body 4 to 6 cm across, cup-shaped, expanding with age, sessile; inner surface, concave becoming convex, often umbilicate, white at first, pale lilac or brownish in age; outer surface, white then faintly reddish or lilac; flesh, whitish, thin and brittle.

**Microscopic features:** Ascospores 10 - 13 × 5 - 7 µm, elliptical, with two oil drops, minutely ornamented with warts when mature, nipples at poles, uniseriate; asci, 220 - 250 × 8 - 10 µm, 8 - spored, cylindrical, operculate, amyloid especially around the operculum; paraphyses, cylindrical, sometimes with slightly curved upper part, septate, hyaline, clavate, 5 to 7 µm at the apex. Habit and habitat: Gregarious, both this form and sparassoid form \((P. proteana f. sparassoides)\) collected together at the same place, under burnt poplar and willow stumps. March to July. North America, uncommon in Europe (Beug et al., 2014).

**P. proteana f. sparassoides**

Figure 2 shows the macroscopic and microscopic features as follows:

**Macroscopic features:** Fruit body 15 to 40 cm broad, up to 20 cm high, cabbage head-like mass of many small cups lacking stipe; inner surface smooth or wrinkled, individual cups whitish to lilac when young, pinkish tan or brownish in age; outer surface, same color of inner
surface, lilac around the base; flesh thin, brittle.

**Microscopic features:** Ascospores 10 - 13 × 5 - 7 µm, elliptic, minutely ornamented with fine warts at maturity, hyaline, with one or two oil drops, uniseriate, nipples at poles; asc 195 - 300 × 8 - 10 µm, 8 - spored, cylindrical, operculate, amyloid tips especially around operculum; paraphyses clavate, 6 - 8 µm at the apex, 2.5 - 3.0 µm near the base, septate. Microscopically, this form is very similar to the cupulate form but deviates macroscopically. Habit and habitat: Solitary or gregarious under burnt poplar or willow stumps. March to July. Widespread in North America, rare in Europe (Beug et al., 2014), very rare in Asia (Barseghyan and Wasser, 2011). The present paper reports *P. proteana* f. *proteana* and *P. proteana* f. *sparassoides* for the first time from Iraq. The two taxa have not been mentioned in any published information including checklists from countries neighboring Iraq like Iran (Ershad, 2009; Karim et al., 2013), Saudi Arabia (Abou-Zeid and Altalhi, 2006), Syria (John et al., 2004) and Turkey (Sesli and Denchev, 2008; Akata et al., 2014). So the two taxa are reported here as new to these countries. After Barseghyan and Wasser (2011), this is the second report of the two forms of *P. proteana* from Asia. Ecologically, the two fungal forms occur in burnt areas and are independent of the presence of plants (Spooner, 2001; Briffa, 2002; Barseghyan and Wasser, 2007, 2011). However, the two forms are very rare in the study area.

**Conclusion**

This study reports the two forms of *P. proteana* for the first time from Iraq and for the second time from Asia, including countries neighboring Iraq. The two forms are very similar microscopically but differ macroscopically and both are very rarely observed in the study area. Ecologically, forms of this species occur in burnt ground and are independent of the presence of vegetation.

**CONFLICT OF INTERESTS**

The author has not declared any conflict of interests.

**REFERENCES**


