

Peziza proteana f. *sparassoides* – a rare taxon for Asian mycobiota from Israel

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Abstract. The “cabbage-head fungus”, *Peziza proteana* f. *sparassoides*, is a rare species and yet has been found in northern Israel. Morphological and habitat descriptions, general distribution, illustrations, and taxonomic discussion of *P. proteana* f. *sparassoides* are presented in this paper.

Key words: “cabbage-head fungus”, Israel, *Peziza proteana* f. *sparassoides*

Introduction

The fungus, *Peziza proteana* f. *sparassoides* (Pezizales, Operculate Discomycetes, Ascomycota) was described by Boudier (1899) as representative genus *Aleuria*. During the 19th and 20th centuries, this species was re-described by most mycologists under various names, and its generic position oscillated among *Aleuria*, *Galactinia*, *Gyromitra*, *Underwoodia*, *Daleomyces*, and *Durandiomyces*.

After detailed microscopic examination and inventarisation of problematic fungi materials of different herbariums in the world, Korf (1956) suggested placing this species within the genus *Peziza*. Later on, he compares the species with type form *Peziza proteana* f. *proteana* and he saw, that it had many differences from the type species, as well a large-sized fruiting body, consisting of numerous groups of apothecia, which look like a cabbage, and was therefore, called “cabbage-head fungus”.

The group of Operculate Discomycetes fungi has been insufficiently studied in Israel. The only previous records from Israel can be found in several papers (Rayss 1940, 1947, 1953; Binyamini 1972a, b, 1973a, b, 1984, 1986, 1989,

1991, 1993, 1994; Nemlich & Avizohar-Hershenzon 1972, 1975, 1976a, b; Avizohar-Hershenzon & Nemlich 1974, 1978). About the genus *Peziza* we can find some notes in the works of Binyamini (1973a, b, 1984, 1986, 1993, 1994), and Avizohar-Hershenzon & Nemlich (1974). After checking the existing information about the genus *Peziza* in Israel, 25 species were found: *Peziza ammophila* Durieu & Mont., *P. badia* Pers. : Fr., *P. badiofusca* (Boud.) Dennis, *P. brunneoatra* Desm., *P. cerea* Sowerby, *P. cervina* (Fuckel) Sacc., *P. emileia* Cooke, *P. echinospora* P. Karst., *P. fimeti* (Fuckel) Seaver, *P. fuliginea* Schumach. : Fr., *P. micropus* Pers. : Fr., *P. moseri* Aviz.-Hersh. & Nemlich, *P. nivalis* (R. Heim & L. Remy) M.M. Mosser, *P. plebeia* (Le Gal) Nannf., *P. praetervisa* Bres., *P. pustulata* (Hedw.) Pers. : Fr., *P. repanda* Wahlenb. : Fr., *P. saniosa* Schrad., *P. sepiatra* Cooke, *P. succosa* Berk., *P. succosella* (Le Gal & Romagn.) M.M. Moser ex Aviz.-Hersh. & Nemlich, *P. varia* (Hedw. : Fr.) Fr., *P. vesiculosa* Bull., and *P. violacea* Pers. : Fr.

By reviewing all existing literature about this species in Israel we found very poor information about this taxon. *P. proteana* f. *sparassoides* has been studied by Avizohar-Hershenzon & Nemlich (1974) and Binyamini (1986).

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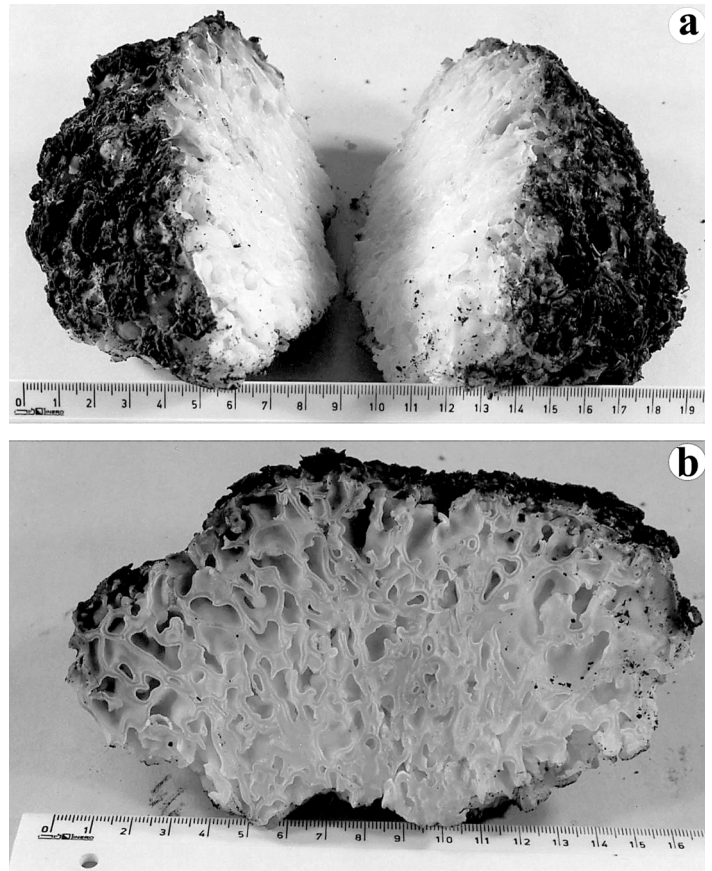


Fig. 1. Ascocarps of *Peziza proteana* f. *sparassoides*: a – cross section; b – locular structure of hymenium

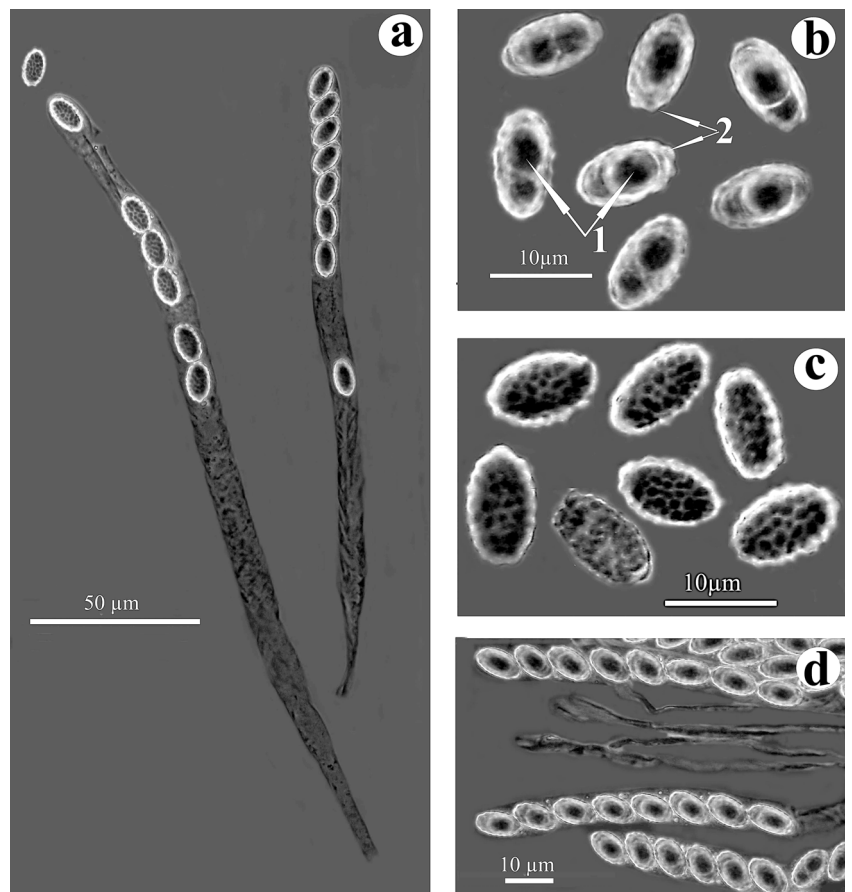


Fig. 2. Microscopic structure of *Peziza proteana* f. *sparassoides*: a – asci with eight spores; b – spores (1 – with one and two oil drops; 2 – with two sharp appendages in the end of each spore); c – wart surface of spores; d – hymenium (asci, spores, and paraphyses)

Materials and Methods

Our specimen is preserved in the herbarium of the Institute of Evolution (HAI, Haifa, Israel). The microscopic characteristics of fungus were observed with a Carl Zeiss Amplital microscope. Microscopic photos were taken with the Photocamera "Sony". The chemical reagent used in the microscopic examination was Melzer's reagent. Fungal material was mounted on a microscope slide and examined in water using a light/dark-field microscope with or without phase contrast at 20 \times , 40 \times , and 100 \times (oil immersion). For statistical calculations, 30-40 spores, asci, and paraphyses were measured for every preparation.

Description

Peziza proteana (Boud.) Seaver f. *sparassoides* (Boud.) Korf, Mycologia 48: 714 (1956) **Figs 1-2**
 ≡ *Aleuria proteana* var. *sparassoides* Boud., Bull. Soc. Myc. Fr. 15: 50 (1899)
 ≡ *Galactinia proteana* var. *sparassoides* (Boud.) Sacc. & P. Syd., Syll. Fung. (Abellini) 16: 709 (1902)
 ≡ *Underwoodia sparassoides* (Boud.) Bánhegyi, Index Horti Bot. Univ. Budapest 3: 19 (1937)

= *Gyromitra phillipsii* Masee, British Fungus Flora 4: 478 (1895)
 ≡ *Durandiomyces phillipsii* (Masee) Seaver, N. Amer. Cup Fungi (*Operculates*) Supplement, p. 242 (1928)
 ≡ *Daleomyces phillipsii* (Masee) Seaver, N. Amer. Cup Fungi (*Operculates*), p. 337 (1942)
 = *Underwoodia campbellii* Sacc., Annal. Mycol. 7: 433 (1909)
 ≡ *Peziza proteana* f. *campbellii* (Sacc.) Korf, Rep. Tottori Mycol. Inst. 10: 392 (1973)
 ≡ *Daleomyces campbellii* (Sacc.) J. Moravec, Česká Mykol. 36(2): 112 (1982)
 = *Daleomyces gardneri* Setchell, Mycologia 16: 241 (1924)
Icon.: Boudier, E., *Icones Mycologicae ou Iconographie des champignons de France principalement Discomycetes*, 2, Librairie des sciences naturelles, Paris, 1905-1910; Dennis, R.W.G., *British Ascomycetes*, Pl. VI-L, 1981; Avizohar-Hershenzon, Z. & Nemlich H., *Pezizales of Israel, II, Pezizaceae*. Pl. I, 10, Isr. J. Bot., 1974.

Ascocarps very large, apothecia forming a cauliflower-like mass ("cabbage-head fungus"), about 16 cm in height and width, extremely convoluted and brittle, sessile, formed by numerous apothecies, as an interlaced mass of *Peziza* with form of ears, folds; it is white to cream color with lilaceous-pink tones, dark brown-ochraceous in the parts exposed to

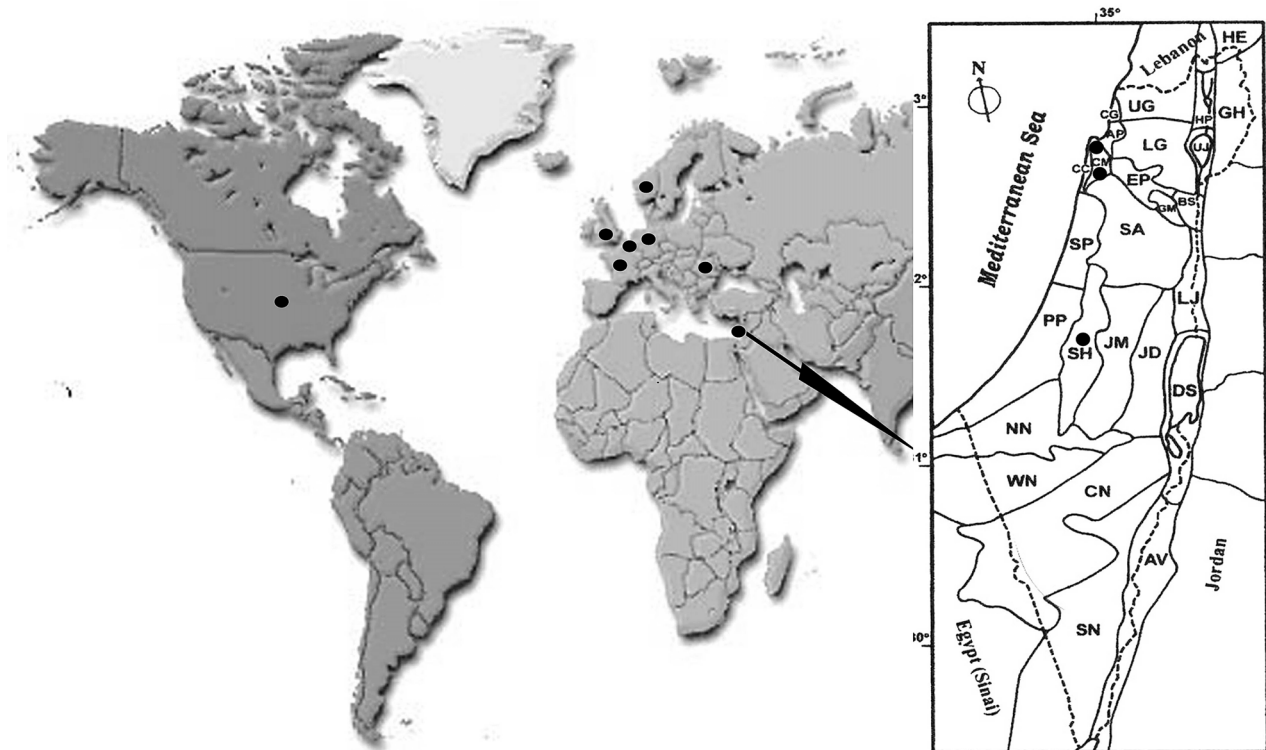


Fig. 3. Distribution of *Peziza proteana* f. *sparassoides*. Accepted abbreviations of nature regions of Israel: AP – Akko Plain, AV – Arava Valley, BS – Beit Shean Valley, CC – Carmel Coast, CG – Coast Galilee, CM – Carmel Mount, CN – Central Negev, DS – Dead Sea Area, EP – Esdraelon (Yizre'el) Plain, GH – Golan Heights, GM – Gilboa Mount, HE – Hermon Mount, HP – Hula Plain, JD – Judean Desert, JM – Judean Mts., LG – Lower Galilee, LJ – Lower Jordan Valley, NN – Northern Negev; PP – Philistean Plain, SA – Samaria, SH – Shefela, SN – South Negev; SP – Sharon Plain, UG – Upper Galilee, UJ – Upper Jordan Valley, WN – Western Negev (Feinbrun-Dothan & Danin 1998)

the sun; it has the winding, lobule margin. **Stem** lateral, rudimentary or absent. **Flesh** granular, very fragile, white, with fungi scent and little appreciable flavor. **Hymenium**, located in the internal part of ascophores, is smooth and concolor to the external part. **Asci** are cylindrical, sometimes curved, attenuated in the base, with a species of heel or salient, obtuse and deformed protuberance near the base, measure 170-200 × 9.2-11.5 μm (up to 300 × 11 μm (Dennis 1981), 236-191 × 8.8-10.3 μm (Avizohar-Hershenson & Nemlich 1974), 180-250 × 7-11 μm (Binyamini 1986), 8-spored, hyaline, reaction with Melzer's reagent positive, asci amyloid. **Ascospores** of 10-12 × 6-7 μm (including appendages), Q = 1.6-1.7, elliptic, hyaline, with two, sometimes one oil drops, ornamentation of fine, irregular, oblong warts, with two sharp appendages in the end of spores. **Paraphyses** of 180-262 × 5-6 μm cylindrical, slender, clavate in the apex, widening in the base.

General distribution and habitat (Fig. 3): Humus saprotroph, very rare. On the ground in wood, especially of *Quercus*, *Fagus*, often after fires. April to May, in England September to October (Dennis 1981). Europe (United Kingdom, Germany, France, Belgium, Norway, Czech Republic), Asia (Israel), and North America (USA).

Specimen examined: ISRAEL: SH, mixed wood, 19 Feb 1970 (Avizohar-Hershenson & Nemlich 1974); CM, Bet Oren N., on the ground in *Quercus* wood, 4 Dec 1984, leg. H. Lahav (Binyamini 1986); CM, near University of Haifa, on the burnt ground in woods and on charred stumps, 12 Apr 2001, leg. S. Reshetnikov, det. G. Barseghyan (HAI-D-001).

Discussion

Peziza proteana f. *sparassoides* is quite a rare species for Europe. It is well known in England (Dennis 1981). Literature overview shows that this species appears mostly in burned places in September and October in *Fagus* forests (Dennis 1981). This fungus was found in places with poor vegetation, in open places in Germany (Schieferdecker 1963). So, we can definitely say that the development of this fungus does not depend on vegetation formations.

This is the third time that this species was found in Israel; it is a very rare species for Israeli and Asian mycobiota. By its form it can be confused with *Sparassis crispa* (Wulfen : Fr.) Fr., this opinion was traced in some literature (Saccardo 1902). This species differs from other species of the genus *Peziza* and it is easily recognized by its very large fruiting body and microscopic examination of the amyloid asci and warted spores. We noticed that the spores of our species are characterized by two appendages at the edge, and by one oil drop in most of all cases. This characteristic was never mentioned in any other descriptions. It is clearly distinguished from the species of *Helvellaceae* by the blue reaction of its asci to iodine. In all microscopic features it is similar with a normal cup-shaped form of *Peziza proteana*.

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