

NEW RECORDS OF ASCOMYCETES (PEZIZALES) FOR THE MYCOBIOTA OF UZBEKISTAN

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Three new records of *Pezizales* including one genus *Scutellinia* and two species of *Helvella* are reported for the first time from Uzbekistan. *Scutellinia scutellata* (L.) Lambotte, *Helvella acetabulum* (L.) Quél. And *Helvella quelletii* Bres. were found from the Nuratau ridge, North-Western Pamir-Alay. Detailed descriptions and illustrations are provided.

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Key words: *Pezizales*; macrofungi; new records; *Scutellinia*; *Helvella*; Uzbekistan; Nuratau ridge

گزارش‌های جدید از آسکومیست‌های راسته (Pezizales) برای فلور قارچی ازبکستان

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سه گزارش از قارچ‌های راسته Pezizales شامل یک گونه از جنس Scutellinia و دو گونه از جنس Helvella برای اولین بار از کشور ازبکستان گزارش می‌شوند. گونه Scutellinia scutellata، Helvella acetabulum و H. quelletii در حاشیه نوار تاو، شمال غرب سلسله جبال پامیرآلای جمع آوری شدند. مشخصات مورفولوژیکی این قارچ‌ها و تصاویر آنها ارائه می‌گردد.

INTRODUCTION

Pezizales is an order of the phylum *Ascomycota* with 1683 species belonging to 199 genera and 16 families (Kirk et al., 2008). The representatives of this order are generally saprobic, mycorrhizal, or parasitic on plants. These fungi grow on various substrates as soil, wood, leaves, and dung, and most of them are distributed in temperate regions or in highlands. The order includes epigeous, semihypogeous to hypogeous taxa. Many species are economically valuable (e.g. truffles). *Pezizales* are distinguished by stalked or sessile apothecial ascomata, operculate asci, and single-celled, bilaterally symmetrical, roughly spherical to ellipsoidal ascospores (Hansen & Pfister, 2006).

Currently, 17 species of *Pezizales* have been reported for Uzbekistan (Gulyamova et al. 1990, Iminova 2009). One of them, *Tuber aestivum* Vitt., is included in the national red list (The Red Data Book of Uzbekistan, 2009). During field expeditions of 2012-2015 in the Nuratau ridge, we found 3 representatives of this order new for the mycobiota of

Uzbekistan.

The Nuratau ridge is the peripheral north-western branch of the Pamir-Alay mountain system wedged into the Kyzyl-Kum desert. It is a semiarid middle-altitude mountain chain about 200 km length separated by Sanzar River Valley from the Turkestan ridge on south-east. The highest peak is 2169 m a.s.l. The mean annual precipitation in the western part of the Nuratau ridge is 283 mm (Nurata weather station, WMO code 38565) and 392 mm in the eastern part (Djizak weather station, WMO code 38579). The mean annual temperature in this area is +14°C (Williams & Konovalov, 2008).

MATERIALS AND METHODS

The macrofungi samples were collected during fungal inventories conducted in the Nuratau nature reserve in 2012-2015. Digital photographs were taken in natural habitats and all necessary morphological and ecological features of specimens were recorded. Fruiting bodies were cleaned, dried in the open air and stored at room temperature in paper bags. For

microscopic investigation of asci, spores, and paraphyses, a fragment of dried apothecium was rehydrated in water. Specimens were examined in distilled water and were described based on characters observed in fresh and dried ascocarps. Microstructures were studied using an Motic B1 microscope. Measurements were made for 10-20 ascospores, asci. Species identification was performed according to Smitskaja (1980), Kullman (1982) and Thomas (2007). Fungal names are given in accordance with Mycobank (www.mycobank.org), author citations are abbreviated according to the Index Fungorum (<http://www.indexfungorum.org/AuthorsOfFungalNames.htm>). Samples were deposited at the Laboratory of mycology, Institute of Botany and zoology, Academy of Sciences of Uzbekistan.

RESULTS

New records

Pyronemataceae Corda

Scutellinia (Cooke) Lambotte

Scutellinia is a widely distributed, almost cosmopolitan genus of *Pyronemataceae* which has not been previously recorded in Uzbekistan. These fungi are easily recognized by red or orange apothecia with distinctive blackish-brown hairs ("eyelashes") on the margins.

Scutellinia scutellata (L.) Lambotte, Mém. Soc. roy. Sci. Liège, Série 2: 299 (1887) – *Peziza scutellata* L.,

Species Plantarum: 1181 (1753) – *Helvella ciliata* Scop., Flora carniolica 2: 481 (1772) – *Elvela ciliata* Scop., Flora carniolica 2: 481 (1772) – *Peziza ciliata* (Scop.) Hoffm., Vegetabilia Cryptogama 2: 25, t. 7:3 (1790) – *Peziza scutellata* Schumach., Enumeratio Plantarum, in Partibus Sællandiae Septentrionalis et Orientalis Crescentium 2: 432 (1803) – *Peziza aurantiaca* Vent., Hist. champ. France: index, t. 10 (1812) – *Lachnea scutellata* (L.) Sacc., Champignons de France: 57 (1879) – *Humariella scutellata* (L.) J. Schröt., Kryptogamen-Flora von Schlesien 3-2(7): 37 (1893) – *Patella scutellata* (L.) Morgan, Journal of Mycology 8 (4): 187 (1902) – *Ciliaria scutellata* (L.) Quélex Boud., Histoire et Classification des Discomycètes d'Europe: 61 (1907) (fig. 1).

Scutellinia scutellata is the type species of genus *Scutellinia*, as well as the most widespread. It has disc-shaped or cup-shaped apothecia, usually 0.2-1.5cm in diameter. Hymenium is bright orange-red. The flesh is red and thin. The outer surface is covered with tiny dark hairs. Marginal hairs are longer and thicker, stiff, eyelash-like, almost black, initially directed inward, and protruding outward when fruit body is mature. *S. scutellata* has asci 235-250 x 18-20 µm in size, and releases elliptical spores measuring 18 - 12 µm. The translucent (hyaline). Ascospores have a rough exterior, (with very small warts) and contain small droplets of oil.

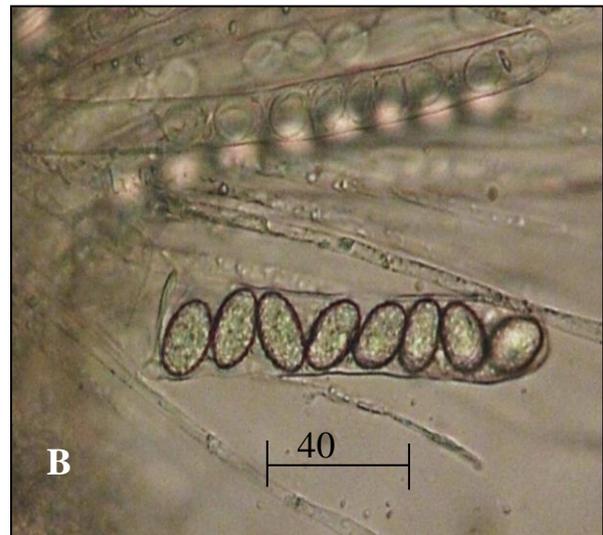


Fig. 1. A, Fruit bodies in *Scutellinia scutellata*; B, Ascus and ascospores (Photo by I. Mustafaev).

Specimens examined: Nuratau ridge, Nuratau nature reserve, Majrum valley, 40°33' 52" N, 66°42' 02" E, 03.05.2014 (IM 302); Nuratau ridge, Nuratau

nature reserve, Gurdara valley, 40°31'03" N, 66°55'02" E, 28.05.2014, (IM 314); Nuratau ridge, Nuratau nature reserve, Hayat valley, 40°52' N,

66°75'E, 1067 m a.s.l., 05.05.2015 (IM 305); Nuratau ridge, Nuratau nature reserve, on the north slope of Hayatbashi peak, wet place near a spring, among mosses, 40°49' N, 66°77'E, 1654 m a.s.l., 27.07.2015 (IM 415).

Habitat: *Scutellinia scutellata* is a saprobic species grow in gin small groups or in clusters, on soil or wood, in damp habitats. Fruit bodies can be occurred from spring through autumn (Kullman, 1982). In the Nuratau nature reserve, we found this fungus in spring (late April and early May) and summer (July) in following habitats: on the damp wood of *Salix alba* L., even under water on fallen burnt trunks (Majrum valley); on a damp stump of *Populus alba* L. (Hayat valley); near a spring on wet soil among mosses (the north slope of Hayatbashi peak); on the old damp fruit body of *Laetiporus sulphureus* (Bull.) Murrill (Gurdara valley).

Distribution: Greenland, Canada, USA, Mexico, Chile, Argentina, United Kingdom, Norway, Sweden, Finland, the Netherlands, France, Italy, Germany, Estonia, Russia, Armenia, Azerbaijan, Iran, Kazakhstan, Kyrgyzstan, Tajikistan (Kullman, 1982;

Ershad, 2009).

Helvellaceae Fr.

Helvella L.

According to Iminova (Iminova 2009), 3 species of the genus *Helvella* have been recorded in Uzbekistan, they are distributed mainly in the mountainous regions of the country.

***Helvella acetabulum* (L.) Quél.,** Enchiridion Fungorum in Europa media et praesertim in Gallia Vigentium 0: 275 (1886) – *Peziza acetabulum* L., Species Plantarum: 1181 (1753) – *Octospora acetabulum* (L.) Timm, Flora megapolitanae ProdomusexhibeusplantasductatusMega politano: 260 (1788) – *Macroscyphus acetabuliforme* Gray, A natural arrangement of British plants 1: 672 (1821) – *Aleuria acetabulum* (Linnaeus) Gillet, Champignons de France, les Discomycètes: 36 (1879) – *Paxina acetabulum* (L.) Kuntze, Revisio generum plantarum 3 (1891) – *Acetabula acetabulum* (Linnaeus) Underwood & Earle, Bulletin of the Alabama Agricultural Experimental Station 80: 200 (1897) (fig. 2).

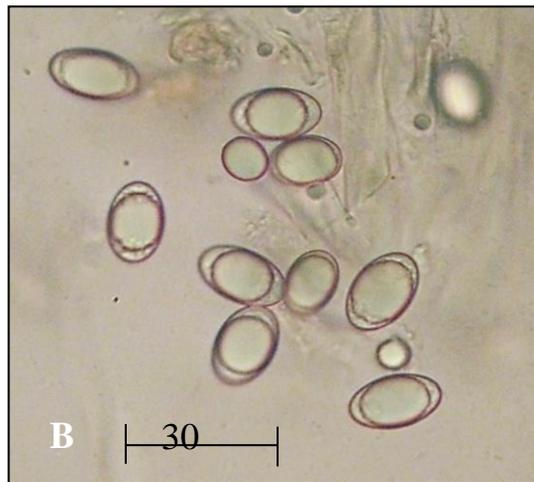


Fig. 2. A, Fruit body in *Helvella acetabulum*; B, Ascospores (Photo by I. Mustafaev).

Helvella acetabulum is one of the most distinctive representatives of the genus. The species has relatively large cup-shaped apothecia 2-5 cm in height and 2-5 cm in diameter, margin is smooth when young, cracking and uneven with age. The hymenium is smooth, dark brown, brown or ocher-brown; the exterior sterile surface is velvety, with prominent branching ribs, white, whitish-yellow or cream-colored. Stem is up to 9 cm in height and up to 3 cm in diameter, whitish, deeply ribbed and folded. Asci are 240–270 × 10–18 μm, 8-spored. The spores are

smooth, elliptical, translucent (hyaline), 17–19 × 11–13 μm, and contain a single large central oil droplet.

Specimen examined: Nuratau ridge, Nuratau nature reserve, Hayat valley, on soil, 40°52' N, 66°76'E, 1047 m a.s.l., 03.05.2015 (IM 312).

Habitat: This fungus is saprobic species growing on soil only. *Helvella acetabulum* is very rare in the studied area; we found it from single location cited above.

Distribution: North America, Europe, Israel, Jordan, Turkey, Iran (Dissing, 1966; Ershad, 2009).

Helvella queletii Bres., Fungi Tridentini 1 (3): 39 (1883) [MB#146762] – *Acetabula queletii* (Bres.) Benedix, Kulturplanze: 365 (1962) [MB#325761] –

Paxina queletii (Bresadola) Stangl, Bericht der Naturforschenden Gesellschaft Augsburg 16: 114 (1963) [MB#813004] (fig. 3).

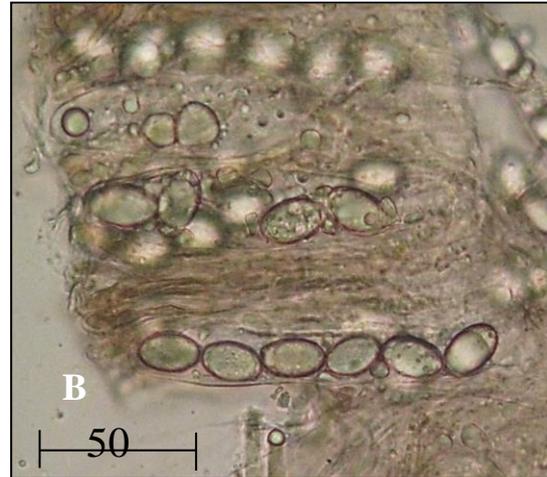


Fig. 3. A, Fruit bodies in *Helvella queletii*; B, Ascus and ascospores (Photo by I. Mustafaev).

Fruit bodies are up to 4-6 cm in height. The cap is 2-3 cm in diameter, cup-like or saucer-like, often folded inward along a central axis when young. Upper surface is grayish brown to brown, smooth or slightly wrinkled; undersurface is pale grayish brown to whitish. Flesh is thin and brittle. Stem is to 4-5 cm long and 0.5-1 cm thick, usually deeply ribbed with round-edged ribs that terminate at the apex of the stem and do not continue far onto the under surface of the cap; whitish or pale brown. Asci are cylindrical, 230-240 x 15-19 μm , 8-spored. Spores are 18-20 x 10-13 μm , elliptical; smooth; with one central oil droplet.

Specimen examined: Nuratau ridge, Nuratau nature reserve, Hayat valley, on the loose soil in deciduous forest, 40°52'N, 066°75'E, 1040 m a.s.l., 27.05.2014 (IM 310).

Habitat: *Helvella queletii* is saprobic fungus growing on soil in woodlands. It is rare species in the Nuratau mountains, only one location is known.

Distribution: North America, United Kingdom, Norway, Sweden, Finland, France, Italy, Germany, Estonia, Belarus, Lithuania, Russia, Armenia, Azerbaijan, Kazakhstan (Smitskaja, 1980).

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