

**History of observations of the rare lichen species
Chaenotheca brunneola (Ach.) Müll. Arg. in Ukraine
and its new finding from Kharkiv Forest-Steppe**

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Chaenotheca brunneola (Ach.) Müll. Arg. is a species of lichenized fungi that belongs to Coniocybomyces M. Prieto & Wedin, Ascomycota Caval.-Sm. Genus *Chaenotheca* was created by Theodor Magnus Fries in 1860, although at that moment *C. brunneola* was already described by Swedish lichenologist Erik Acharius in 1816 as *Calicium brunneolum*. In 1862 this species was moved to the genus *Chaenotheca* by Johannes Müller Argoviensis [17].

Chaenotheca brunneola can be characterized as pinhead lichen with crustose, very thin and barely visible fine-granulose thallus, pale green to pale grayish-yellow, gives pale red KOH reaction, subthallus whitish, barely visible. Apothecia stalked, with a distinct excipulum, on sometimes 2-3 branched, slightly widened towards the base, glossy black, sometimes covered with a transparent hyaloid layer, sometimes brown because of stickled spores, stems 1-3 (6) mm length and 0,05-0,1 mm width. Capitulum (head) spherical or, rarely, broadly conical, without epicortex, but usually covered with brown spores, 0,12-0,3 mm. Spore mass convex, hemispherical, blackish or olive-brown to pale-brown. Spores brown to yellowish-brown, smooth, spherical or almost spherical 2-4 (6) μm . Picoconidia rod-shaped, 5-6 \times 1 μm . Photobiont is *Dictyo chloropsis* spp. [2, 10, 21]. Species occurs in the plain and mountain forests, on the cortex of deciduous or coniferous trees (but most frequently on *Quercus* spp.), on rotten wood, stumps, and dead branches [2, 10].

The first observed record of the *C. brunneola* (as *Calicium brunneolum*) from Ukraine was made by Theodor Magnus Fries, who visited St. Petersburg with the aim to revise several lichenological collections. The majority of lichens investigated by him were collected in the Kharkiv region by V.M. Cherniaiev – Ukrainian mycologist and botanist from Kharkiv University (now V.N. Karazin Kharkiv National University). The results were published by T. Fries in 1855 in his work “*Om Ukräns Laf-vegetation*” [15]. Later this article was cited by V. Mychailovskyi (1927), A. Oxner (1956), O. Bajrak et al. (1998) and A. Gromakova (2014) [1, 3, 9, 10].

At the beginning of the XX century, several findings of this lichen from the Transcarpathian region were mentioned in the publications of Hungarian lichenologist Ödon Szatala as “*Chaenotheca shaereri*” and then cited by Oxner (1956) and Kondratyuk (2003) [10, 19].

In 1963 Ukrainian lichenologist O.G. Roms mentioned this species in her article “Distribution of genus *Chaenotheca* Th. Fr. on the territory of Ukraine” [12]. In 1977 there was published an article by V.R. Maslova dedicated to the lichens of Polissia Nature Reserve from the Zhytomyr region, in which *C. brunneola* also was mentioned [8]. In the monograph of S.Ya. Kondratyuk and coauthors “The second checklist of lichen forming, lichenicolous and allied fungi of Ukraine” in 1998 *C. brunneola* was specified from the territory of Transcarpathian region and the Republic of Crimea [20]. In 2003 in the monograph “A catalogue of eastern Carpathian lichens” a big revision of the information on this species occurrence in the Carpathians was made, including data from S.Ya. Kondratyuk article about lichens of the Uzhansky National Nature Park (1999) [18, 19]. In 2008 *C. brunneola* was registered from the territory of the Desniansko-Starohutskyi National Nature Park from Sumy region by O.O. Redchenko and later cited by Khodosovtsev and Darmostuk [11, 13]. In 2016 N. Chepelevska registered *C. brunneola* as a new species for Chornohora mountain range in the Carpathians [14].

In the database “Fungi of Ukraine” there are 23 records of *Chaenotheca brunneola* from the Republic of Crimea, Kharkiv, Rivne, Volyn and Transcarpathian regions [16]. Some of them are referred in the publications of Kondratyuk & Solonina

(1990), Kopachevskaya (1986), Makarevich, Navrotskaya & Iudina (1982) and Oksner (1956) [4, 5, 7, 10].

Among one of the newest data on findings and distribution of *Chaenotheca brunneola* there is a publication of Kharkiv lichenologist A.B. Gromakova who has collected two specimens (CWU 200380 and 200381) from the Kharkiv region [3].

Our specimen of *C. brunneola* (CWU (Myc) AS 8461) was collected by V. Chvikov and O. Prylutskyi on April 15, 2021 from the territory of Kharkiv Forest Research Station, quarter 126, sub-quarter 1, Derhachi district, Kharkiv region (lat: 50.0908351592, long: 36.2834869154). It was found on a dead lying branch of *Quercus robur* L. in the deciduous forest with the prevalence of *Quercus robur* and *Tilia cordata* in the first tier and *Carex pilosa* in the grass cover. EUNIS habitat type G1.A – Meso- and eutrophic oak, hornbeam, ash, sycamore, lime, elm and related woodland [6].

Chaenotheca brunneola is a lichen of a high conservation value. For example, it treated as “endangered” in the “Red List of extinct and threatened lichens in Poland” [21]. According to available information on the distribution of this species in Ukraine, it also may be proposed for including in the regional Red Lists.

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