Candelariella antennaria NEW TO RUSSIA, KAZAKHSTAN, NEPAL AND INDIA

Candelariella antennaria – НОВЫЙ ВИД ДЛЯ РОССИИ, КАЗАХСТАНА, НЕПАЛА И ИНДИИ

Summary: Candelariella antennaria is reported from Russia, Kazakhstan, Nepal and India for the first time. Its distribution, ecology and differences from similar species are discussed.

Key words: Asia, Candelariaceae, floristic finding.

Among Candelariella Müll. Arg. there is a small number of species which are characterized by having a non-yellow thallus. The species are 8-spored with lecanorine apothecia, growing on calcareous rocks (C. plumbea Poelt & Vezda, C. oleaginescens Rondon) or bark and wood (C. vae-lacteae G. Thor & V. Wirth, C. antennaria Räsänen and C. boikoi Khodos. & S.Y. Kondr.). Candelariella subdeflexa (Nyl.) Lettau, also with grey thallus and 8-spored asci, differs from the others by its bia torine apothecia. They are predominately distributed in the temperate zone in open woodlands, forests and forest-steppes and prefer dry, exposed conditions.

Of the 22 Candelariella species known from Russia (Urbanavichus, 2010) there is only one species from this group – C. boikoi, reported from the southern part of European Russia (Khodosovtsev et al., 2004). During an investigation of material in the herbaria of H, S and UPS and fresh material from Dagestan, we have found a corticolous Candelariella with a grey thallus growing on Populus, Larix, Acer, Betula, Cercis, Cotoneaster as well as shrubs which we have identified as Candelariella antennaria. The specimens from Russia, Kazakhstan and Nepal were found under the name C. aurella in the herbaria. In the Helsinki herbarium we have also found a specimen from India which was annotated as C. deflexa (Nyl.) Zahlbr., by Hakulinen, that belongs to C. antennaria (see discussion). Candelariella antennaria was described by Räsänen (1939) and is considered as a distinct taxon (Hakulinen, 1954; Westberg, 2007b). The species is known from Crete (Vondrák et al., 2008), Austria and Switzerland (Westberg & Clerc, 2012), South and North America (Westberg, 2007b), Afghanistan (Westberg & Sohrabi, 2012), Iran (Moniri et al., 2011; Seaward et al., 2008; Westberg & Sohrabi, 2012) and Australia (Filson, 1992).

In literature it has also been reported from Tadzhikistan (Kudratov & Mayrhofer, 2002) and Uzbekistan (Hakulinen, 1958) as Candelariella deflexa. This species is reported here as new to Russia, Kazakhstan, Nepal and India. Candelariella antennaria is not included in the latest checklists of these countries (Andreeva, 1983; Awasthi, 1991; Poelt & Reddi, 1969; Singh & Sinha, 2010; Urbanavichus, 2010) and we have not found any reports of this species in later studies. In addition we confirm the presence of the species in Tadzhikistan.

The description below is based on material from Russia and Kazakhstan only. It agrees well with
Candelariella antennaria Räsänen, 1939, Anales Soc. Ci. Argent.: 128; 137.

Type: Argentina, Mendoza Depto. Las Heras, pr. Quebrada de la Meina la Atala, 2 July 1937, A. Ruiz Leal (H – holotype!).

Thallus crustose, indistinct or visible as a more or less entirely amorphous or somewhat granular crust, sometimes poorly developed and occurring only at the base of the apothecia, without vegetative diaspores. Granules 0.1–0.2 mm in diameter, first rounded, adnate and moderately convex, then developing into areoles 0.2–0.5 mm wide which are irregular in outline, adpressed and flattened, scattered or coalescing and then organized in an uneven crust. The surface is pale to medium greyish to greyish brown, smooth, matt to ± shiny, epruinose.

Prothallus absent. Thallus in section with a thin, 4–18 µm thick, indistinct cortex, 1–2(–3) cell-layers thick, composed of ± isodiametric, thin-walled cells 5–15 × 2–3 µm, which become shorter and rounded towards the surface and are finally similar to the cells of the cortex, below the hypothecium the cells are rounder or somewhat elongated, thin-walled and do not form a stipe penetrating downward through the algal layer. Epiphyllum reddish-yellow to yellow-brown of irregular, angular crystals, 5–12 µm tall; hymenium hyaline, with oil drops, 50–70 µm tall; hypothecium hyaline, with oil drops, 20–50 µm tall; asci 8–spored, clavate to broadly clavate, 40–53 × 13–18 µm, Candelariella- or Lecanora-type; spores hyaline, simple, rarely 1-septate, straight to slightly curved, oblong to narrowly ellipsoid (11–) 12–15/(–20) × 4.0–5.0–6.0/(–7.0) µm (N=60); paraphyses septate, simple or branched near the tips or in the midhymenium, with anastomoses in the midhymenium, 1.5–2.0 µm wide in midhymenium, with cylindrical or clavate tips, 3–6 µm wide.

Pycnidia: not seen.

Chemical spot reactions: Thallus K–, disc K+ weakly orange; Thallus KC–, disc KC–; Thallus C–, disc C–; Hymenium I+ blue; Medulla, excipulum, hypothecium I–.


**Discussion**

The key characters of the species are a greyish, indistinct or amorphous crustose thallus, yellow, lecanorine apothecia, surrounded by a persistent thalline margin that is paler than disc, and 8-spored asci (Fig. 1). It differs from *C. aurella* in its pale to medium grey to greyish-brown thallus, which could be seen at least at the base of the apothecia even if it is poorly developed, whereas *C. aurella* normally has a yellow, granular to areolate thallus. Anatomically it differs from *C. aurella* by the proper exciple, which is composed of non-gelatinized, thin-walled hyphae with ±isodiametric cells and that does not form a stipe through the algal layer into the thallus below (Fig. 2). In contrast, the proper exciple of *C. aurella* consists of strongly gelatinized, thick-walled hyphae with elongated to rectangular cells, forming a distinct stipe penetrating downward through the algal layer (Westberg, 2007b). There are two other corticolous grey-thalline species, *C. subdeflexa*, which has biatorine apothecia, i.e., lacking a thalline margin in all stages of apothecium development and has a distinct, usually well-developed squamulose thallus with conidiophores on the lower side of the squamules (Westberg, 2007a), and *C. viaelactae* characterized by its thallus, composed of crowded, round granules (Thor & Wirth, 1990).

According to the protologue (Räsänen, 1939) and the monograph by Hakulinen (1954), *C. antennaria* has no thallus. However, in our studies of the holotype (at H) we observed a thin, poorly-developed but visible grey thallus. *Candelariella antennaria* shows a wide variation in thallus morphology and could include a complex of species (Westberg & Sohrabi, 2012). Hakulinen (1954) also recognized another 8-spored, grey-thalline species, *Candelariella deflexa* only known from the type growing on glass. Hakulinen (1958) later used the name for corticolous specimens from North America and Uzbekistan and the name has since mostly been used in that sense. The name *C. deflexa* was considered a synonym to *C. aurella* by Westberg (2007b) who proposed that *C. antennaria* should be the correct name for the corticolous taxon studied here.

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![Fig. 1. Candelariella antennaria, habitus. Russia: Guv. Jenisejsk. Brenner 444j (S F70281).](image)

![Fig. 2. Candelariella antennaria, section of an apothecium showing the base of the proper exciple. Russia: Guv. Jenisejsk. Brenner 444j (S F70281).](image)
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LITERATURE


