

Caloplaca albopustulata, a new saxicolous lichen from Crimea Peninsula, Ukraine

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Caloplaca albopustulata is described as new from the Crimea Peninsula, Ukraine. It belongs to the group of black fruited species with grey thallus. It is mainly characterized by pustulate pruinose outgrowths developing both in the central portions and the margins. The new species is compared with a few other related taxa.

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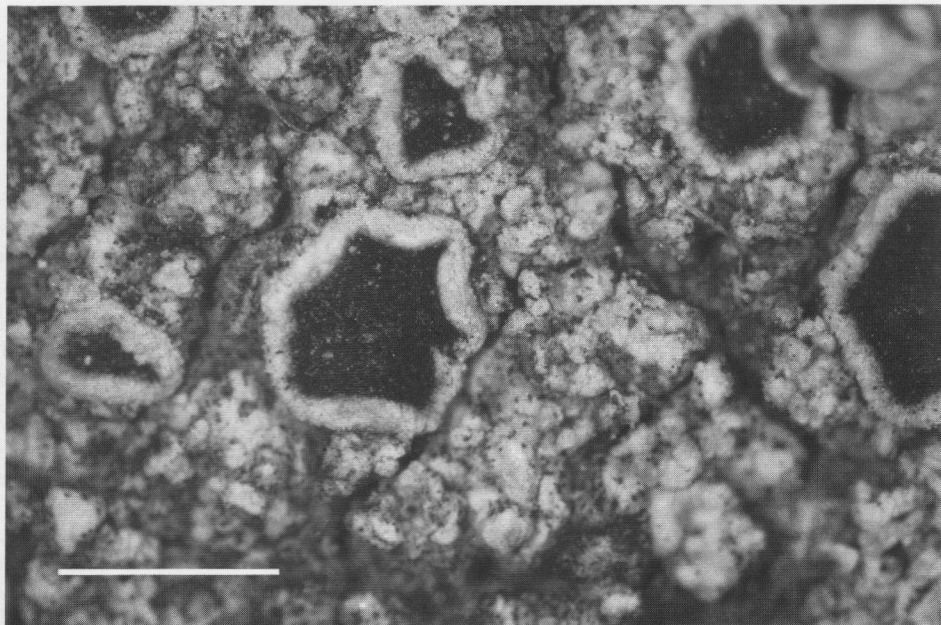
The genus *Caloplaca* Th. Fr. comprises an enormous diversity of species, presumably over 800, occurring in many different biota and habitats all over the world. Several more or less distinctive groups of species can be recognized although intermediate forms occur in many cases (Clauzade & Roux 1985, Kärnefelt 1989). There is no world checklist or revision of the entire genus apart from the list of names produced by Cliff Wetmore <http://www.tc.umn.edu/~wetmore/AllCaltop.htm>. Species are mainly revised in smaller groups from various geographical regions, of which Europe and North America are best known (Arup 1995, Hansen et al. 1987, Navarro-Rosines & Hladun 1996, Wetmore & Kärnefelt 1998, Wetmore & Kärnefelt 1999, Wetmore 2001).

The species with grey thalli and with brown or black apothecia have sometimes of practical reasons been referred to as *Pyrenodesmia* although we know that this

group is artificial and not phylogenetically justified (Kärnefelt 1989, Wetmore 1994, Wunder 1974). These species, which generally are less collected and more difficult to recognize in the field, nevertheless seem to be widespread and occur mainly on acidic and calcareous rocks in many regions. A few species are also corticolous (Wetmore 1994). Material of these species has been treated from various geographical regions e.g. from the Himalayas by Poelt & Hinteregger (1993) and from North and Central America by Wetmore (1994). Presumably many new species will be discovered in the future, especially in arid regions with calcareous rocks which seem to represent regions with optimal conditions for this group of lichens.

Material and methods

The results presented here are based mainly on herbarium material kept in KW, LD, C, BM, GZU, TNS, H, B, S. For anatomical



Figures 1. *Caloplaca albopustulata*, holotype. General habitus of thallus with pustulate outgrowths and apothecia. Bar = 1 mm.

observations, fragments of lichens were sectioned with a Kryomat, Leitz freezing microtome and sections put in lactophenol-cotton blue or water. Anatomical structure and hymenial characters were studied with a Zeiss Axioscope light microscope, and photomicrographs made with a Digital DP 11 camera.

Caloplaca albopustulata* Khodosovtsev & S. Kondratyuk *sp. nov.

Thalli crustosus, a simili *Caloplaca variabili* differt, papillis albo-pruinosis et epithecio K-.

Type: Ukraine, Crimean Autonomy Republic, Alushta district, Mt. Southern Demerdji, "Dolina Prividnij", on conglomerate, 2000, Khodosovtsev (KW, holotype; KHER, LD- isotypes).

Thallus crustose, areolate to slightly lobed at the margins, dusty-grey to white-greyish, up

to 5-7 cm large. Areoles angular, 0.5-1.5 mm across, flat, 0.15-0.2 mm thick, soon covered by spherical white-greyish pruinose outgrowths. Squamules often formed at the edge of the thallus, slightly convex up to 1.5-2.0 mm long. The greyish pruinose outgrowths occur both in the central portions and on the margins. Mature outgrowths when broken off leave concentric cracks near the base 0.15 mm wide, white pruinose. Cortical layer paraplectenchymatous.

Apothecia zeorine to lecanorine, sessile, constricted at the base, 0.4-0.7 (-1.2) mm wide. Disc brown to black, concave to flat, first with white pruina, mature discs less pruinose. Margin thick, folded over the disk, white-pruinose. Thalline exciple 110-130 μ m thick with numerous algal cells and with a thin cortex, incrustated by white crystals, 15-20 μ m across. Proper exciple prosoplectenchymatic, 15-18 μ m in the central part to 15-25 μ m at the edge. Hypothecium hyaline to pale

Table 1. Character states in *Caloplaca albopustulata* and related species.

	<i>C. albopustulata</i>	<i>C. bullata</i>	<i>C. variabilis</i>	<i>C. teicholyta</i>
<i>Thallus</i>	areolated to lobated at the edge	areolated	areolated	placodioid to areolated
<i>Upper surfaces</i>	isidia-like protuberans	uneven to tuberculate	flat	eroded cortex with soredia-like elements
<i>Apothecia (color)</i>	brown to black	black	black	ferruginous-red
<i>Epithecium</i>	K- or slightly violet	K+ purple-violet	K+ purple-violet	K+ purple
<i>Cortex</i>	K+ intensely violet	K+ intensely violet	K+ intensely violet	K+ intensely violet
<i>Ascospores (μm)</i>	12-14(-16) × (6)7-8 (-9)	12-16 × 7-8	12-16 × 7-9	14-18 × 7-10
<i>Isthmus (μm)</i>	1.5-2.5	2-3	3-3.5	2-4
<i>Apical cells paraphyses (μm)</i>	to 3.5	to 5.5	to 3.5	4-5
<i>Substrate</i>	conglomerate	limestone	limestone	sandstone, limestone

brownish, with numerous crystals, 70-80 μm high. Epithecium brownish, 10 μm. Hymenium 35-50 μm, hyaline. Asci 8-spored, ascospores 12-14(-16) × (6)7-8 (-9) μm, septum 1.5-2.5 μm thick. Paraphyses up to 2 μm thick, slightly swollen at tips up to 3.5 μm diam. Pycnidia not seen. The pruinose white parts of the thallus K+ (intensive violet), disc and epithecium K- or slightly violet.

The new species is known occurring on conglomerate in arid localities associated with *Acarospora nodulosa*, *Anaptychia desertorum*, *Lecanora dispersa* and *Verrucaria macrostoma*.

The name *C. albopustulata* refers to the very characteristic pustule-like outgrowths with white pruina.

Additional specimens examined: Ukraine. Crimean peninsula. Alushta district: Mt.

Southern Demerdji, "Dolina Prividnij", alt. 400 m, on conglomerates, 2000, Khodosovtsev (KW, KHER). Sudak district: near Zelenogoriye, Mt. Svidaniya, alt. 700 m, on conglomerates, 2001, Khodosovtsev (KHER).

Taxonomic notes: *Caloplaca albopustulata* is mainly characterized by the spherical pustulate outgrowths (Figure 1). In addition the epithecium is K-. In general, vegetative diaspores seem to be rare in this group of lichens (Wunder 1974; Clauzade & Roux 1984; Wetmore 1994). A few sorediate species are known e.g. the European *C. obscurella* which grows on bark (Söchting 1994) and the North American *C. diplacia* (Wetmore 1994). Furthermore *C. neotropica* also known from North America is isidiate (Wetmore 1994).

The Asian *C. bullata*, characterized by slightly swollen areoles resembles *C. albo-*

pustulata, especially in younger individuals. *Caloplaca albopustulata*, however, differs from *C. bullata* in the presence of marginal pruinose outgrowths. *Caloplaca variabilis* is characterized by having more flat areoles without diaspores or other outgrowths. Sterile specimens of *C. albopustulata* with well developed marginal squamules and lobules can resemble sterile specimens of *C. teicholyta*. The cortical layer in *C. teicholyta* is, however, different being slightly eroded with soredia-like structures on the surface (Table 1).

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