

GORTANIA - Atti Museo Friul. Storia Nat.	16 (1994)	89-97	Udine, 31.V.1995	ISSN: 0391-5859
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LICHENOLOGICAL STUDIES IN NORTH-EASTERN ITALY.
VI. SPECIES NEW TO FRIULI OR VENEZIA GIULIA*

STUDI LICHENOLOGICI IN ITALIA NORD-ORIENTALE.
VI. SPECIE NUOVE PER IL FRIULI O LA VENEZIA GIULIA

Abstract - Four lichens (*Biatora mendax*, *Fuscidea kochiana*, *Leptogium massiliense* and *Pertusaria carneopallida*) and the lichenicolous fungus *Dactylospora athallina* are reported for the first time from Friuli; five species (*Catapyrenium psoromoides*, *Collema occultatum*, *Physconia perisidiosa*, *Strigula mediterranea* and *Thelopsis rubella*) are new to Venezia Giulia (NE Italy). A detailed description of each species and critical notes on its ecology and geographic distribution are provided.

Key words: Flora, Friuli, Lichens, Venezia Giulia.

Riassunto breve - *Quattro specie di licheni* (*Biatora mendax*, *Fuscidea kochiana*, *Leptogium massiliense* e *Pertusaria carneopallida*) ed un fungo lichenicolo (*Dactylospora athallina*) sono riportati per la prima volta dal Friuli, cinque specie di licheni (*Catapyrenium psoromoides*, *Collema occultatum*, *Physconia perisidiosa*, *Strigula mediterranea* e *Thelopsis rubella*) dalla Venezia Giulia. Per ciascuna specie si forniscono una dettagliata descrizione morfo-anatomica e notizie sull'ecologia e sulla distribuzione geografica.

Parole chiave: Flora, Friuli, Licheni, Venezia Giulia.

1. Introduction

The knowledge of the lichen Flora of Friuli-Venezia Giulia is still incomplete: many areas of the pre-Alpine districts have never been visited by lichenologists, and fragmentary informations are available for the Friulian plain (TRETACH, 1993). Also the exploration of the Carnic and Julian Alps is far from being satisfactory: complete lists of taxa are in fact available only from a few areas, such as the Lumiei Valley (NIMIS, 1982) and the high Torre Valley (CASTELLO et al., 1990; TRETACH & CASTELLO, 1993). To date, 638

* This study has been supported by M.U.R.S.T. funds, responsible prof. P.L. Nimis.

infrageneric taxa have been reported from Friuli, and 431 from Venezia Giulia (NIMIS & TRETACH, 1994). In this paper we give information on ten species that are new to Friuli or to Venezia Giulia, as a further contribution to the knowledge of the lichen Flora of this region.

2. Data and methods

The cited samples are preserved in the Herbarium Universitatis Tergestinae (TSB). For each species, a brief comment on its ecology and geographic distribution is given, plus a morpho-anatomical description of the samples collected by the authors. For each sample, locality, altitude, substratum, date of collection, collector name and data bank number are given. Nomenclature follows NIMIS (1993) and, for species which are not cited in this work, CLAUZADE & ROUX (1985).

Sections of thalli and ascomata were mounted in water and Lugol's solution. All measurements were made in water mounts. The iodine reaction of the asci was observed in Lugol's solution after pretreatment with K.

3. The species

Biatora mendax Anzi

Friuli: - Carnic Alps, lago di Sauris (UD), Rio Scalotta gorge, ca. 1080 m, on *Fagus*, 7.9.1993, leg. P. Carvalho & M. Tretach, conf. Ch. Printzen (18178).

Thallus crustose, thin, areolate, green-grey (vivid green in some parts), esorediate, Pd+ orange, K-, KC-, C-. Apothecia frequent, biatorine, dark brown, with a paler margin (more evident in young apothecia). True exciple well developed, composed of radiating, branched hyphae with protruding, capitate terminal cells. Epithecium olive greenish-brown, K-, N-, C- (but becoming reddish brown before discolouring in C). Hypothecium pale-coloured, olive greenish-brown or yellow-brown, N-, C-, K+ light yellow-green. Paraphyses coherent in K, not clavate at their tips. Asci 8-spored, *Biatora*-type. Ascospore colourless, narrow, oblong-fusiform, simple or uni-septate, smooth, 14-16 (18) x 3-4 μ m. Pycnidia not seen.

The thallus of this poorly-known species is usually effuse, granular to granular-verrucose (Printzen, in litt.); our sample was probably grazed by snails, and has regenerated afterwards; thallus reactions and ascus-type are diagnostic.

The sample was collected in a very deep gorge near the lake of Sauris, which hosts an interesting lichen flora with many rare species, such as *Lecanora cinereofusca*, *Loxospora cismonica*, *Parmotrema crinitum*, *Pertusaria carneopallida* and *Sticta*

fuliginosa. *Biatora mendax* is generally found on *Abies*, but in this area many other lichens that are usually bound to a particular phorophyte are found on other substrata as well; this is probably due to the high humidity of the site (JØRGENSEN, 1978).

B. mendax does not belong to *Biatora* s.str., being related to a small, heterogeneous group of epiphytic lecideoid lichens (*Lecidea atroviridis*, *L. ocelliformis*) whose investigation is far from being complete (Printzen, in litt.). In Italy *B. mendax* was previously known only from the type locality in Valtellina (ANZI, 1862), and from a single collection in South Tyrol (DALLA TORRE & SARNTHEIN, 1902).

Catapyrenium psoromoides (Borrer) R. Sant.

Venezia Giulia: - Karst, lago di Doberdò (GO), ca. 20 m, on an ancient, solitary *Quercus*, 12.09.1993, leg. M. Tretach (17845); - ibid., 19.09.1993, leg. M. Tretach (17935).

Thallus thick, formed by pale brown or grey-brown, flat squamules loosely attached to the substratum. Lower surface dark brown or black, ecorticate, pale-coloured or whitish near the margin of young squamules. Perithecia frequent, almost completely immersed in the thallus, with a pale or pinkish exciple, except near the ostiolum. Paraphyses present, well-developed; paraphyses absent at maturity. Asci 8-spored, clavate, thin-walled; spores biseriolate, hyaline, simple or uniseptate, ellipsoid, often with acute ends, 15-20 x 5-7 μ m.

C. psoromoides is found on the rough bark of isolated trees, such as *Quercus*, *Olea*, *Juglans* or *Tilia*, sometimes at the base of the boles and – exceptionally – on epilithic mosses. Our sample was collected on a very old oak, with other interesting lichens, more or less intermingled to briophytes.

C. psoromoides is the only epiphytic species of the genus in Europe. It has a scattered distribution in Europe (map in BREUSS, 1990), where it is not common, and also occurs in North America, New Zealand and East Africa. In Italy it is quite rare and is known only from a few localities (Alto Adige, Lombardia and Abruzzi: see NIMIS, 1993).

Dactylospora athallina (Müll. Arg.) Haf.

Friuli: - Carnic Alps, lago di Sauris (UD), Rio Scalotta gorge, ca. 1080 m, parasite on *Baeomyces rufus*, on sandstone, 07.09.1993, leg. M. Tretach (17864).

This is a lichenicolous fungus with black, lecideoid apothecia, up to 0.5-0.6 mm in diameter (fig. 1a). Disc of apothecia flat, opaque, minutely cracked; proper margin thick, shiny, persistent. Paraphyses thin, simple, more or less conglutinate. Epithecium without crystals, but with an amorphous pigment, K+ vivid red and rapidly disappearing; hymenium pale straw-coloured, subhymenium greenish-yellow; excipulum formed by large, angular cells with a red-brown pigment in the outer part, and a blue-blackish pigment in

the inner part (fig. 1b). Asci 8-spored, vivid J+ blue after pretreatment with K; spores uniseptate, brown, thin-walled, biseriata, ca. 8-12 (14) x 3-5 μm .

Non-lichenized, parasitic species previously assigned to the genus *Buellia* were segregated into several genera (*Abrothallus*, *Dactylospora*, *Karschia*, etc.). Species belonging to *Dactylospora* are characterized by asci without an apical thickening, uniseptate or muriform spores, and paraphyses that are sparsely branched only in the upper part (HAFELLNER, 1979; CLAUZADE & ROUX, 1985).

Dactylospora athallina is an obligate parasite on *Baeomyces rufus*, which can be easily identified by the K+ red reaction of the epithecium in thick sections, and the peculiar structure of the excipulum. Another characteristic parasite of *B. rufus* is *Epilichen scabrosus*, which was previously reported from the Carnic Alps by TRETIACH (1993).

Fuscidea kochiana (Hepp) V. Wirth & Vezda

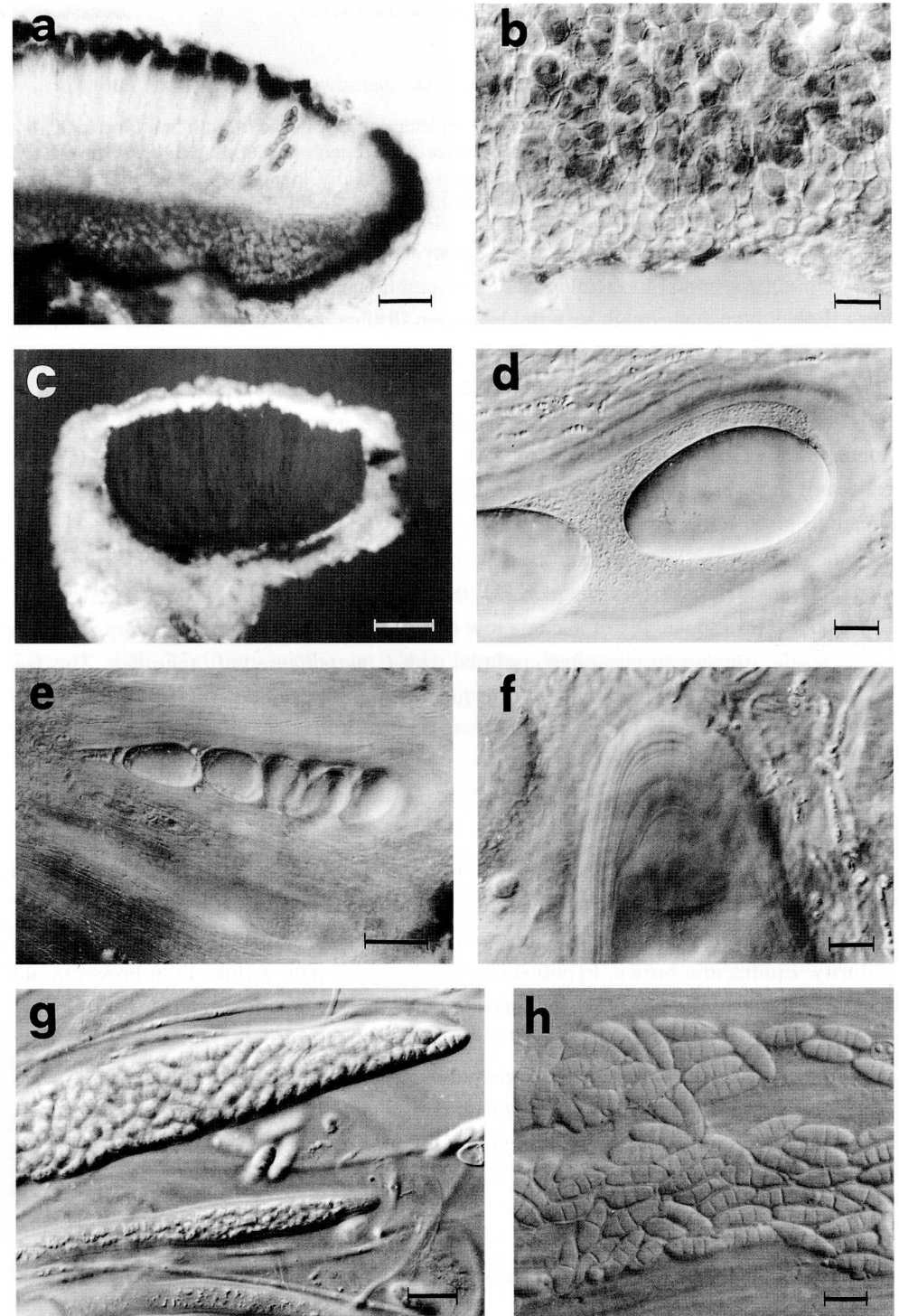
Friuli: - Carnic Alps, M. Crostis (UD), siliceous rocks of the southern slope, ca. 2200 m, at the base of a siliceous boulder, 08.09.1993, leg. G. Bolognini & M. Tretiach (17839).

Thallus thick, areolate, without prothallus, K-, C-, KC-, I-. Apothecia black, immersed, \pm angular, flat, with a very thin, not always evident proper margin. Epithecium brown, hypothecium well-developed, colourless; basal apothecial medulla very thick, formed by anticlinally arranged hyphae. Paraphyses scarcely swollen, simple or sparsely branched, anastomosed, conglutinated in water, up to 3 μm . Asci *Fuscidea*-type, 8-spored. Spores simple, hyaline, elliptical or subglobose, 7-10 x 4-7 μm .

In Europe *F. kochiana* has a boreal-montane distribution, and is found on siliceous rocks in rather humid conditions. There are several records of this species from the whole Alpine region and from the northern Apennines (NIMIS, 1993), but this lichen was never reported before from Friuli.

Fig. 1- *Dactylospora athallina* (TSB 17864): cross section of apothecium with uniseptate, brown spores (a); excipulum (b). *Pertusaria carneopallida* (TSB 17868): cross-section of apothecium under polarized light (c); spores (d); asci (e); multi-layered ascus wall (f). *Thelopsis rubella* (TSB 17546): multispored asci (g); tri-septate spores (h). Scales: a, e: 30 μm ; c: 100 μm .

- *Dactylospora athallina* (TSB 17864): sezione trasversale di un apotecio con spore brune uniseptate (a); excipolo (b). *Pertusaria carneopallida* (TSB 17868): sezione trasversale di un apotecio osservata in luce polarizzata (c); spore (d); aschi (e); parete pluristratificata dell'asco (f). *Thelopsis rubella* (TSB 17546): aschi multisporei (g); spore triseptate (h). Scala: a, e: 30 μm ; b, d, f-h: 10 μm ; c: 100 μm .



Leptogium massiliense Nyl.

Friuli: - Carnic pre-Alps, Col del Sole, near the cemetery of Avasinis, ca. 230 m, on limestone, in a *Quercus ilex* stand, 10.10.1993, leg. G. Oriolo & M. Tretiach (18066). - High Arzino valley, crossroad between F.lla Chianzutan and the road towards C.li Chiampon, 750 m, south-exposed, vertical calcareous faces, 25.04.1993, leg. G. Bolognini, A. Rondi & M. Tretiach (17083).

Thallus up to 1-1.5 cm in diameter, rather irregular, formed by cylindrical, radiating lobes closely adpressed to the substratum, resembling *Pseudephebe pubescens* in growth form. Lobes branched, rough to wrinkled when dry, ca. 0.1-0.2 mm wide, with nodular thickenings. Apothecia not present.

L. massiliense is known from central and southern Europe (JØRGENSEN, 1994). In Italy it is relatively uncommon, being known only from a few localities in Liguria and Southern Italy (see NIMIS, 1993; JØRGENSEN, 1994). In Friuli it has been observed (but not collected) in several localities of the pre-Alpine district, where it grows in rather exposed situations on calcareous or dolomitic rocks.

L. massiliense may be confused with the apparently similar *Lempholemma* cfr. *intricatum*, which is rather frequent in the southeastern pre-Alps (see TRETACH & CASTELLO, 1993); the cortex of a single row of isodiametric cells observed in cross section is diagnostic. Another species often confused with *L. massiliense* is *L. schraderi*. This has small, erect cushion-like thalli with thicker (up to 0.6 mm), deeply wrinkled lobes.

Melaspilea urceolata (Fr.) Almb.

Venezia Giulia: - Karst, lago di Doberdò (GO), ca. 20 m, on an ancient, solitary *Quercus*, 12.9.1993, leg. M. Tretiach (17846).

Thallus white, thin, endophloedic, with *Trentepohlia* as photobiont. Apothecia frequent, ± rounded, superficial or slightly depressed, up to 0.3 mm in diam. Disc of apothecia deep brown, flat or slightly convex; excipulum thin, often disappearing at maturity. Epithecium brown, hypothecium colourless or pale yellow, light brown in old apothecia. Paraphyses branched and anastomosed. Spores brown at maturity, uniseptate, slightly restricted at the septum, 15-17 x 6-7 µm.

M. urceolata is a suboceanic, thermophilous species which occurs on the bark of old deciduous trees, such as *Quercus*, *Castanea* and *Ulmus*. In Italy it is rather rare, and is known mainly from records of the previous century. The species was reported from the Trieste district only by SCHULER (1902), as *Melaspilea arthonioides*.

Pertusaria carneopallida (Nyl.) Anzi

Friuli: - Carnic Alps, lago di Sauris (UD), Rio Scalotta gorge, ca. 1040 m, on *Fagus*, 07.09.1993, leg. M. Tretiach (17868).

Thallus thin, immersed, whitish, with numerous, well-dispersed fruiting bodies. Apothecia open, with flat, pinkish-brown disc and lacerate borders, incrustated by calcium oxalate crystals (fig. 1c). Paraphyses richly branched; well-developed algal layer present under the hymenium; asci (4)-8-spored (fig. 1e), spores simple (fig. 1d).

P. carneopallida has been reported from Scandinavia and the Alps, and seems to have a panboreal distribution; from Italy there are only old records dating back to the previous century. This specimen was collected in a very humid site of the lake of Sauris, on an ancient beech, together with *Loxospora cismonica*, *Pannaria conoplea*, and *Parmotrema crinitum*.

P. carneopallida has probably the most confused nomenclatural history in the genus *Pertusaria*; for a critical discussion, see DIBBEN (1980).

Physconia perisidiosa (Erichsen) Moberg

Venezia Giulia: - Karst, Lago di Doberdò (GO), ca. 20 m, on *Quercus pubescens*, 13.12.1993, leg. M. Tretiach (18183).

Thallus sorediate, loosely attached to the substratum, grey or grey-brown, with spots of pruina on the upper cortex. Marginal lobes not sorediate, central lobes ± imbricate and reflexed, with labriform soralia on short lobules, becoming confluent. Medulla K-. Underside almost completely white, slightly pale brown in the central part of the thalli (but in typical thalli the underside is often deep brown), with black, brush-like rhizinae. The specimen, not very well-developed, was on a young oak shaded by climbing plants; this can explain the unusual pale colour of the upper cortex.

Ph. perisidiosa is an epiphytic species which sometimes also occurs on epilithic mosses. In Italy it is rather uncommon, avoiding polluted or excessively nutrient-enriched situations, and is more frequent in areas with a rather humid climate, mainly in the montane belt.

Another sorediate species related to *Ph. perisidiosa* is the apparently similar *Ph. detersa*, a boreal-montane lichen (POELT, 1966) not yet reported from Friuli. The latter species is characterized by marginal soralia, and a continuous cortex at the margins of the lobules.

Strigula mediterranea Etayo

Venezia Giulia: - Karst, dolina di Borgo Grotta Gigante, ca. 230 m, on *Quercus petraea*, 08.1993, leg. P. Carvalho (17802).

Thallus endophloedic, grey, thin, smooth, K-, C-, KC-, Pd-. Photobiont *Trentepohlia*. Perithecia black, conical, with a well-developed involucrellum. Paraphyses simple, persistent. Asci bitunicate, cylindrical, 8-spored. Ascospores biseriolate, colourless, or light

brown, fusiform, with rounded ends, 1-septate, easily breakable at the septum. Conidiomata not found.

This specimen was collected in a large dolina of the Trieste Karst, where it was rather frequent, chiefly at the base of some oaks. It was associated with common lichens such as *Acrocordia gemmata*, *Bacidia rubella* and *Hyperphyscia adglutinata*.

S. mediterranea has been reported from several localities of the Mediterranean coastal regions (see ETAYO, 1993). In Italy it was only known from Toscana (NIMIS, 1993) and Calabria (PUNTILLO, 1987, 1992).

This species was often misunderstood; in the older literature it was named *Porina schizospora* (POELT & VEZDA, 1977) and only recently ETAYO (1993) transferred it to the genus *Strigula*. The two genera are rather similar but clearly differ from each other in the structure of the asci. In *Strigula* the asci are distinctly fissitunicate, and have a conspicuous apical dome penetrated by a narrow ocular chamber.

Thelopsis rubella Nyl.

Friuli: - Rocca Bernarda (UD), Bosco Romagno, on *Quercus*, 170 m, 25.12.1981, leg. P. L. Nimis (2393).

Venezia Giulia: - Karst, dolina di Borgo Grotta Gigante, ca. 235 m, on *Quercus petraea*, 18.06.1993, leg. E. Crevatin & P. Carvalho (17546).

Thallus crustose, thin, epiphloeidic, poorly-developed. Photobiont *Trentepohlia*. Perithecia immersed in the thallus when young, then often protruding, with a rather thick ostiolum, pale pinkish-brown to dark brown. Excipulum light-coloured, brown in the upper part, interspersed in the inner part. Paraphyses simple, persistent, 1-1.5 µm thick. Hymenium strongly J+ blue. Asci multi-spored (up to 100 spores), lanceolate, with a narrow tip (fig.1g). Spores colourless, without episporium, triseptate (a few spores uniseptate), 13-16 x 5-6 µm (fig.1h). Pycnidia not seen.

The specimen from the Karst, collected on the North-exposed slope of a large dolina, is very poorly-developed, and has only a few perithecia.

Th. rubella is present throughout temperate Europe. In Italy it mainly occurs in areas with an oceanic-suboceanic climate, such as the Thyrrhenian regions (NIMIS, 1993). In our country it is probably more common than the few known samples would suggest, being easily overlooked.

Manoscritto pervenuto il 25.IX.1994.

Acknowledgements

We are grateful to prof. P. L. Nimis (Università di Trieste) for useful comments on the manuscript, and to prof. J. Poelt (University of Graz), and to dr. Ch. Printzen (Botanische Staatssammlung München) who kindly examined some critical samples.

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