

Notulae to the Italian flora of algae, bryophytes, fungi and lichens: 2

Sonia Ravera¹, Annalena Cogoni², Cecilia Totti³, Michele Aleffi⁴, Silvia Assini⁵, Stefania Caporale¹, Zuzana Fačková⁶, Giorgia Filippino², Gabriele Gheza⁵, Nicola Olivieri⁷, Mauro Ottonello⁸, Luca Paoli⁹, Silvia Poponessi¹⁰, Ivan Pišút⁶, Roberto Venanzoni¹⁰

1 Dipartimento di Bioscienze e Territorio, Università degli Studi del Molise, C.da Fonte Lappone, 86090 Pesche (Isernia), Italy **2** Dipartimento di Scienze della Vita e dell'Ambiente, Università degli Studi di Cagliari, viale Sant'Ignazio da Laconi 13, 09123 Cagliari, Italy **3** Dipartimento di Scienze della Vita e dell'Ambiente, Università Politecnica delle Marche, via Breccie Bianche, 60131 Ancona, Italy **4** Scuola di Bioscienze e Medicina Veterinaria, Università degli Studi di Camerino, via Pontoni 5, 62032 Camerino (Macerata), Italy **5** Dipartimento di Scienze della Terra e dell'Ambiente, Università di Pavia, Via S. Epifanio 14, 27100 Pavia, Italy **6** Institute of Botany, Slovak Academy of Sciences, Dúbravská cesta 9, SK-84523 Bratislava, Slovakia **7** via Maestri del lavoro 40, 64100 Teramo, Italy **8** Via Primo Maggio 46, 18018 Taggia (Imola), Italy **9** Dipartimento di Scienze della Vita, Università degli Studi di Siena, Via P.A. Mattioli 4, 53100 Siena, Italy **10** Dipartimento di Chimica, Biologia e Biotecnologia, Università degli Studi di Perugia, Borgo XX giugno 74, 06121 Perugia, Italy

Corresponding author: *Sonia Ravera* (sonia.ravera@unimol.it)

Academic editor: *L. Peruzzi* | Received 15 October 2016 | Accepted 1 November 2016 | Published 22 November 2016

Citation: Ravera S, Cogoni A, Totti C, Aleffi M, Assini S, Caporale S, Fačková Z, Giorgia Filippino, Gheza G, Olivieri N, Ottonello M, Paoli L, Poponessi S, Pišút I, Venanzoni R (2016) Notulae to the Italian flora of algae, bryophytes, fungi and lichens: 2. Italian Botanist 2: 43–54. doi: 10.3897/italianbotanist.2.10812

Abstract

In this contribution, new data concerning red algae, lichens and bryophytes of the Italian flora are presented. It includes new records and confirmations for the algal genus *Grateloupia*, the bryophyte genus *Didymodon*, and the lichen genera *Buellia*, *Cladonia*, *Letharia*, *Pertusaria*, and *Pyrenula*.

Keywords

Bryidae, floristic data, lichenized ascomycetes, Rhodophyceae

How to contribute

The text of the records should be submitted electronically to: Cecilia Totti (c.totti@uni-vpm.it) for algae, Annalena Cogoni (cogoni@unica.it) for bryophytes, Alfredo Vizzini (alfredo.vizzini@unito.it) for fungi, Sonia Ravera (sonia.ravera@unimol.it) for lichens.

Floristic records

ALGAE

Grateloupia turuturu Yamada (Florideophyceae)

+ (NAT) **ABR:** Marina, Punta Turchinio, San Vito Chietino (Chieti), a pebbly beach near an artificial reef (UTM WGS84: 33T 455.4683), 24 April 2014, *N. Olivieri* (FI).
– Naturalized alien species new for the flora of Abruzzo.

An exotic species with Indo-Pacific chorology, *Grateloupia turuturu* was originally widespread in the northwestern Pacific, especially in the Japanese seas (Yoshida 1998, Xia 2004). This seaweed later became sub-cosmopolitan after a number of accidental introductions, initially limited to shellfish farming areas, and later due to the spread of aquaculture of the Asian bivalve *Crassostrea gigas* Thunberg (Grizel and Héral 1991, Maggs and Stegenga 1999, Verlaque 2001, Ribera Siguan 2002, Wallentinus 2002, Schaffelke et al. 2006). Currently *Grateloupia turuturu* occurs along the coasts of Japan, China, Korea, the Russian Far East, along the US Pacific coast, especially in California (Aguilar-Rosas et al. 2010, Miller 2012), along the American Atlantic coast (Villalard-Bohnsack and Harlin 1997, Mathieson et al. 2008), along the Atlantic coast of Africa from Namibia to Mauritania, in New Zealand, and in Tasmania (D'Archino et al. 2007). In Europe, this species has been reported since the 1980s along the Atlantic coast and is currently distributed in the Netherlands, Portugal, and the British Isles (Simon-Colin et al. 2001, Araújo et al. 2003, Bárbara and Cremades 2004, Hardy and Guiry 2003, De Clerck et al. 2005, Verlaque et al. 2005, Figueroa et al. 2007). On the French Mediterranean coast, it appeared in 1982 in the Thau lagoon (Riouall et al. 1985). The first report for Italy was for the Venice lagoon (Solazzi et al. 1991-1994), where this species was reported as *G. doryphora* (Montagne) M.Howe. Later, in 2007, *G. turuturu* was found in the Mar Piccolo of Taranto (Cecere et al. 2011) and in the harbour of Ancona (Falace et al. 2010).

Monitoring activities carried out in the San Vito Chietino coast and in the surroundings highlighted that *G. turuturu* is common and settles both on natural hard substrata (conglomerate) and on artificial ones (limestone blocks) used to build break-water reefs. As regards its vertical distribution, it occurs in the higher part of the infralittoral, even in areas affected by intense hydrodynamics. In sheltered areas where hydrodynamics are low, thalli are large, exceeding one meter in length; in such areas, it represents the macroalgal species reaching the largest dimensions. Thalli are evident

and well developed until May. After, they tend to degenerate and disappear, and during the summer only the encrusting basal part of thalli survives, although scarcely visible and often masked by other macroalgal species with different phenology, such as *Ulva rigida* C.Agardh and *Codium fragile* (Suringar) Hariot subsp. *fragile*, the latter being an alien species too. Only in some rocky jags at low light intensity, but still affected by intense hydrodynamics, thalli persist throughout the summer.

Until now, the presence of *G. turuturu* in Italy has been reported only for lagoons and harbour areas. This points to the fact that this species colonizes coastal areas, where the presence of breakwater reefs parallel and perpendicular to the coast alter the circulation and trophic condition of coastal waters, allowing the appearance of harbour-like biotic communities.

N. Olivieri

BRYOPHYTES

Didymodon sinuosus (Mitt.) Delogne (Pottiaceae)

+ **SAR:** S'abba Fittiana, Seui (Ogliastra), at the feet of Monte Tonneri, on *Ostrya carpinifolia* Scop. (UTM WGS84: 32S 531916.4416241), 110 m, 7 May 1996, A. Cogoni, F. Flore (CAG No. SA3/ 70.5.1). – New species for the flora of Sardegna.

Didymodon sinuosus was found in the calcareous “Tacchi” of Seui in the cortex of a mixed forest of *Quercus ilex* L. and *Ostrya carpinifolia* located at the foot of a crag on the northern slope of Monte Tonneri. Exposure to the north and shading by the crag create a special microclimate. *Didymodon sinuosus* usually grows on damp, shady basic rocks nearby streams and rivers and in sheltered habitats on walls and old buildings, among tree roots in woodlands and lowlands (Smith 2004). Associate species include *Brachytecium velutinum* (Hedw.) Ignatov & Huttunen var. *velutinum*, *Ctenidium molluscum* (Hedw.) Mitt., *Distichium capillaceum* (Hedw.) Bruch & Schimp., *Exsertotheca crispa* (Hedw.) S.Olsson, Rnroth & D.Quandt, *Frullania dilatata* (L.) Dumort., *Homalothecium sericeum* (Hedw.) Schimp., *Hypnum cupressiforme* Hedw. var. *cupressiforme*, *Leucodon sciuroides* (Hedw.) Schwägr. var. *sciuroides*, *Orthotrichum lyelli* Hook. & Taylor, *Nogopterium gracile* (Hedw.) Crosby & W.R.Buck, *Ptychostomum capillare* (Hedw.) D.T.Holyoak & N.Pedersen, and *Zygodon rupestris* Schimp. ex Lorentz. The authors followed Ros et al. (2007, 2013) for nomenclature. This species is common in the central-southern part of Italy (Aleffi et al. 2008). It is of phytogeographical interest, since it is at risk in several countries. In Europe, it is assessed as Endangered (EN) in Austria, Rumania and Sweden, and Vulnerable (VU) in the Czech Republic and Switzerland (Hodgetts 2015).

A. Cogoni, G. Filippino

***Didymodon insulanus* (De Not.) M.O.Hill (Pottiaceae)**

+ **BAS:** Sasso Barisano, Matera, on stone wall (UTM WGS84: 33T 636046.4503094), 374 m, 31 August 2016, *S. Poponessi* (PERU). – Species confirmed for the flora of Basilicata.

Didymodon insulanus was found on the “Calcarenite di Gravina” wall, a type of limestone with which houses were built. It is a Eurasian southern-temperate species (Smith 2004). This finding, 100 years after the first reports (Zodda 1909, 1913), is the first record for the “Sassi” of Matera (Aleffi et al. 2008). *Didymodon insulanus* shares the same habitat as *Didymodon fallax* (Hedw.) R.H.Zander and is also very common. It is usually dull green and forms lax tufts or turfs on the ground. It has much longer, narrower leaves than *D. fallax*, recurved along most of their length. In Europe, it is considered Vulnerable (VU) in Switzerland and Estonia, Regionally Extinct (RE) in Finland and Slovakia, Near Threatened (NT) in Hungary and Rumania, and Data Deficient (DD) in Malta and San Marino (Hodgetts 2015).

S. Poponessi, R. Venanzoni, M. Aleffi

LICHENS***Buellia leptocline* (Flot.) A.Massal. (Physciaceae)**

+ **TOS:** Monticiano (Siena), near the biogenetic reserve of Tocchi, on siliceous rock (UTM WGS84: 32T 683677.4778587), 340 m, 5 June 2016, *L. Paoli*, *Z. Fačkovcová* (SAV). – New species for the flora of Toscana.

It is a crustose epilithic lichen, generally growing on perpendicular and overhanging rain-exposed parts of siliceous boulders (Scheidegger 1993), so far reported chiefly in N Italy (Nimis 2016).

L. Paoli, Z. Fačkovcová, I. Pišút

***Cladonia cariosa* (Ach.) Spreng. (Cladoniaceae)**

+ **PIE:** Greggio (Vercelli), within the Lama del Sesia Natural Park, on sandy-pebbly soil in a dry grassland (*Thero-Airion*) developed in the active riverbed of the Sesia river (UTM WGS84: 32T 452817.5033781), 159 m, 4 March 2016, *G. Gheza* (Herb. Gheza); San Giacomo al Bosco, Masserano (Biella), surroundings of the farmhouse “Lo Chalet”, on bare soil at the side of a dirt road between a field and a patch of heathland and deciduous wood (UTM WGS84: 32T 441675.5044948), 240 m, 16 January 2016, *G. Gheza* (Herb. Gheza); “Vauda” of San Carlo Canavese (Torino), on bare soil among *Calluna vulgaris* (L.) Hull shrubs, in a degraded heathland encroached by

grasses (UTM WGS84: 32T 392345.5012651), 366–369 m, 8 March 2016, *G. Gheza* (Herb. Gheza). – Species confirmed for the flora of Piemonte.

+ **LOM:** Bernate Ticino (Milano), within the Valle del Ticino Lombardo Natural Park, surroundings of the Ticino river on bare sandy soil in a dry grassland (*Thero-Airion*) (UTM WGS84: 32T 484052.5035066), 117 m, 25 March 2016, *G. Gheza* (Herb. Gheza); Tornavento heathland, Lonate Pozzolo (Varese), on bare soil among shrubs of *C. vulgaris* in an unmanaged heathland (UTM WGS84: 32T 478302.5049318), 200 m, 25 March 2016, *G. Gheza* (Herb. Gheza); Livigno (Sondrio), surroundings of the artificial lake on soil inside a bush of *Pinus mugo* Turra (UTM WGS84: 32T 589565.5160342), about 1840 m, 18 September 2012, *G. Gheza* (Herb. Gheza). – Species confirmed for the flora of Lombardia.

Historical records of *C. cariosa* from both Piemonte and Lombardy refer almost exclusively to montane and alpine localities (Nimis 1993, Nimis and Martellos 2008); only Nocca and Balbis (1816) reported it for the Po Plain, in fields near Pavia (“*in campis sterilibus prope Papiam*”), while Re (1825) reported it for the Parco della Mandria near Torino, but both these records have not been confirmed in recent times. The new records reported here are, therefore, an important confirmation of the persistence of *C. cariosa* in planitial northeastern Italy after almost two centuries. In Piemonte, Baglietto and Carestia (1867, 1880) reported the species along the gravels of the Sesia river near Riva. The record from Greggio, in the Sesia riverbed, comes from a similar context, though having different substrate, altitude, and climate; transport by the river could be plausible, since the species was not found in other nearby lichen-rich sites placed above the level of the riverbed. Baglietto (1863) recorded it also on peaty soil at the Sempione Pass. In Lombardy, the most recent record is by Rivellini and Valcuvia Passadore (1996) for the Province of Sondrio, while all the others are antecedent to the 1940s. *Cladonia cariosa* is a circumboreal species with a wide distribution, typically on mineral (from sandy to gravelly) soils with low acid to base reaction, in more or less disturbed sites. It can form wide monospecific mats extending for up to several square metres.

G. Gheza

Cladonia incrassata Flörke (Cladoniaceae)

+ **LIG:** Valle del Rio Gavano, Molini di Triora (Imperia), on rotting wood at the base of an old chestnut tree, in an unmanaged chestnut wood (UTM WGS84: 32T 403396.4869732), about 450 m, 17 March 2016, Leg. *M. Ottonello*, Det. *G. Gheza* (Herb. Gheza). – New species for the flora of Liguria.

The distribution of *Cladonia incrassata* in Italy is poorly known, with rather old records. It was reported until now only in Lombardia, Piemonte, Toscana, and Calabria (Nimis 2016). In Lombardia, it has not been recorded for over a century: Rivellini and Valcuvia Passadore (1996) reported a very generic record by Jatta (1909–1911) for the Province of Sondrio, while Anzi (1866) reported the species in the Province of Como

on Mount Capiago. In Piemonte, aside from a historical record by Baglietto (1863) for Mergozzo, a recent record comes from the Conca di Oropa (Isocrono et al. 2006). Rather recent records are those from Tereglio, in Toscana (Nimis 1993) and from Monte Gariglione in Calabria (Puntillo 1996). *Cladonia incrassata* has a suboceanic affinity and its ecological optimum is found on rotting wood and humus-rich soil; rarely it is also found on bark at the base of old trees. In the new site reported here, the species was found on a single rotting trunk of an old chestnut tree together with *C. digitata* (L.) Hoffm. and *C. squamosa* Hoffm. Rotting chestnut wood is the same substrate recorded by Baglietto (1863), Anzi (1866) and Coppins (Nimis 1993). Due to the very scarce records and the specific ecological requirements, the species is considered extremely rare in Italy, where it has been found since now only in the submediterranean and montane belts (Nimis and Martellos 2008).

G. Gheza, M. Ottonello

Cladonia peziziformis (With.) J.R.Laundon (Cladoniaceae)

+ **PIE:** Torrette di Frassineto, Frassineto Po (Alessandria), surroundings of the confluence between the rivers Sesia and Po, within the Fluvial Natural Park of Po and Orba, on sandy-silty soil in a dry grassland (*Thero-Airion*) developed on a former dirt road (UTM WGS84: 32T 467109.4998260), 99 m, 20 June 2012, *G. Gheza* (Herb. Gheza); Greggio (Vercelli), within the Lama del Sesia Natural Park, on sandy-pebbly soil in a dry grassland (*Thero-Airion*) developed in the active riverbed of the Sesia river (UTM WGS84: 32T 452817.5033781), 159 m, 4 March 2016, *G. Gheza* (Herb. Gheza); San Giacomo al Bosco, Masserano (Biella), surroundings of the farmhouse “Lo Chalet”, on bare soil at the side of a dirt road between a field and a patch of heathland and deciduous wood (UTM WGS84: 32T 441675.5044948), 240 m, 16 January 2016, *G. Gheza* (Herb. Gheza); “Vauda” of San Francesco al Campo (Torino), on bare soil among burnt *Calluna vulgaris* shrubs, in a heathland managed with prescribed fire (UTM WGS84: 32T 397692.5009259), 295 m, 8 March 2016, *G. Gheza* (Herb. Gheza); “Vauda” of San Carlo Canavese (Torino), on bare soil among *Calluna vulgaris* shrubs, in a degraded heathland encroached by grasses (UTM WGS84: 32T 392345.5012651), 370 m, 8 March 2016, *G. Gheza* (Herb. Gheza). – New species for the flora of Piemonte.

+ **LOM:** Lonate Pozzolo (Varese), within the Valle del Ticino Lombardo Natural Park, on soil among a thick carpet of bryophytes at the edge of a dry grassland (*Thero-Airion*) evolving towards heathland and shrubland (UTM WGS84: 32T 479440.5046068), 186 m, 13 May 2016, *G. Gheza* (Herb. Gheza). – New species for the flora of Lombardia.

Cladonia peziziformis is considered rare in Europe (Wirth et al. 2013), even though it has a wide distribution, reaching as far as the southern hemisphere (Nimis 1993). In Italy, it was known until now for only four localities, all in Liguria, and not confirmed

after the 1960s (Valcuvia Passadore and Vittadini Zorzoli 1982), although Nimis (2016) stated that the species has probably been overlooked in Italy so far. Jatta (1909-1911) also reported this species, but only very generically for “peaty soil in the Alps”. All the records reported here come from disturbed stands. Well-developed monospecific mats several square metres wide, occur only in two stands: on the sandy-pebbly riverbed of the Sesia - encroached by the allochthonous grass *Eragrostis curvula* (Schrad.) Nees - and a dry grassland developed on a dirt road close to an abandoned quarry. In both sites, vascular vegetation belongs to the *Thero-Airion* Tüxen ex Oberdorfer 1957. Few underdeveloped thalli were found in the other sites, all located in more or less degraded heathlands or along their edges. In the “Vauda” of San Francesco al Campo heathland, the species was found in a site regularly managed with prescribed fire, a situation similar to that described for Norway (Tønberg and Øvstedal 1995) where the species was reported as one of the first colonizers after a fire. In the other heathlands, grass and moss-encroachment have been found to overcome *C. peziziformis*, which is an uncompetitive species (Tønberg and Øvstedal 1995).

G. Gheza

Cladonia portentosa (Dufour) Coem. (Cladoniaceae)

+ **PIE:** Villa Giulia, Cerano (Novara), within the Valle del Ticino Piemontese Natural Park, in a dry grassland (*Thero-Airion*) (UTM WGS84: 32T 487030.5027303), 99 m, on acid sandy-pebbly soil, 25 March 2016, G. Gheza (Herb. Gheza); Greggio (Vercelli), wood southwest of the underpass of Canal Cavour under the Sesia river, near the northern boundary of the Lama del Sesia Natural Park, in a wide clearing with *Thero-Airion* and *Corynephorion* grasslands (UTM WGS84: 32T 452785.5034282), 163-165 m, on acid sandy-pebbly soil, 3 May 2016, G. Gheza, S. Assini (Herb. Gheza).
– Species confirmed for the flora of Piemonte.

In the Po Plain, *Cladonia portentosa* has been recorded formerly only in recent years in the Valle del Ticino Piemontese Natural Park (Gheza 2015) and in the inland sand dunes of Lomellina in Lombardia (Gheza 2015, Gheza et al. 2015). All the formerly known sites are located west of the Ticino river. Those located in the fluvial valley of Ticino, more similar to the two reported here for habitat physiognomy and substrate characteristics, are more northern than that from Cerano, while those found in inland dunes are found at lower altitudes and are more southern. The stand in Cerano is located in a wide clearing in a mixed deciduous wood hosting a dry grassland referable to the *Thero-Airion* Tüxen ex Oberdorfer 1957, in which lichen and moss cover is relevant. Here, *C. portentosa* is never dominant in lichen vegetation, but is found in an evolved stage of the *Cladonietum foliaceae* Klement 1953 emend. Drehwald 1993 dominated by *Cladonia rangiformis* Hoffm. (see Gheza et al. 2016). This is the only site in the Po Plain in which the species is found in plant communities of the *Thero-Airion* and not of the *Corynephorion canescentis* Klika 1931. The stand in Greggio is more similar to

the others: the species is found in a grassland referable to the *Spergulo-Corynephorretum canescentis* (R.Tx. 1928) Libbert 1933. This vegetation is threatened because of the ongoing invasion of *Robinia pseudoacacia* L. and *Ailanthus altissima* (Mill.) Swingle, which is likely to compromise the conservation of the entire habitat already in the short term. All the other records of *C. portentosa* in Piemonte, except those reported above for the Po Plain, refer to montane and alpine sites (Nimis 1993, 2016).

G. Gheza, S. Assini

Letharia vulpina (L.) Hue (Parmeliaceae)

+ **LOM:** Costone, Azzone (Bergamo), on bark of *Larix decidua* Mill., in a larch wood (UTM WGS84: 32T 587851.5090651), 1697 m, 28 August 2016, G. Gheza (Herb. Gheza). – Species confirmed for the flora of Lombardia.

+ **LIG:** Colle Melosa, Pigna (Imperia), on bark of *L. decidua*, in a larch wood (UTM WGS84: 32T 394458.4871579), 1530 m, 28 January 2016, M. Ottonello (Herb. Ottonello). – Species confirmed for the flora of Liguria.

In northern Italy, this species with circumboreal-montane distribution is generally found in montane areas with continental climate, where it finds its ecological optimum in woods of *L. decidua* or *Pinus cembra* L.; it is widespread mainly in the inner part of the Alps (Nimis and Martellos 2008). Three thalli of *L. vulpina* were found on two larch trunks at the edge of a sparse larch wood in the Lombardia stand reported here. This record is interesting because, even if the species is rather common in subalpine coniferous woods in the central Alps, it has never been reported for the Prealps of Lombardia; all the records available for this region refer to inner alpine valleys (see literature cited in Nimis and Martellos 2008).

Also in Liguria, only three thalli were found, on three different trunks. This nonetheless represents an important confirmation of the presence of *L. vulpina*, because all the former records are old and rather vague reporting the species for generic high-altitude woods in the Ligurian Apennines (De Notaris 1846, 1847, Jatta 1909-1911), except for Baglietto (1858), who reports a specimen collected by prof. Balsamo in the Apennines of Bobbio.

M. Ottonello, G. Gheza

Micarea misella (Nyl.) Hedl. (Pilocarpaceae)

+ **TOS:** Abetone (Pistoia), Valle del Sestaione, on wood of *Fagus sylvatica* L. (UTM WGS84: 32T 632539.4888072), 1580 m, 28 June 2002, Leg. S. Ravera, Det. B. Coppins (Herb. Ravera No. 3226). – Species new for the flora of Toscana.

This species seems to be less rare in the Alps than in the Apennines (Nimis 2016). *M. misella* differs from the similar and more common *M. denigrata* (Fr.) Hedl. in that

spores are mostly simple, never curved, paraphyses up to a maximum of 1 μm wide, and that it has a negative reaction to hypochlorite.

S. Ravera

Pertusaria leucosora Nyl. (Pertusariaceae)

+ **TOS:** Monticiano, (Siena), near the biogenetic reserve of Tocchi, on siliceous rock (UTM WGS84: 32T 683677.4778587), 340 m, 5 June 2016, *L. Paoli, Z. Fačkovcová* (SAV). – Species confirmed for the flora of Toscana.

It is a crustose lichen, with large (up to 10 cm) circular thallus, rather thick and areolate, pale to dark grey, with a warted surface, often rich in rounded soralia. The thallus is characterized by a dull brown K^+ (10% potassium hydroxide) reaction and yellow/reddish P^+ (Paraphenylenediamine) yellow/reddish P^+ reaction (Wirth et al. 2013). A recent review of the material stored in the Italian herbaria allowed us to describe the distribution of this species on a nationwide scale (Craighero 2010, Nimis 2016).

L. Paoli, Z. Fačkovcová, I. Pišút

Pyrenula chlorospila Arnold (Pyrenulaceae)

+ **ABR:** Vallevò fraz. di Rocca San Giovanni (Chieti), loc. Fosso della Farfalla, on bark of *Ostrya carpinifolia* Scop. (UTM WGS84: 33T 2476175.4681392), 108 m, 1 November 2014, *S. Caporale, M. Facchini, C. Giancola, D. Pellicciotta* (Herb. S. Caporale). – Species new for the flora of Abruzzo.

This species is a mild-temperate to Mediterranean-Atlantic epiphytic lichen, typical of trees with a smooth bark e.g. *Fraxinus* sp. pl. (Nimis 2016); it has a suboceanic affinity and lives in non-eutrophic sites. It was found in its typical habitat represented by a strip of a deciduous forest along a river incision. *Pyrenula chlorospila* is mainly Tyrrhenian, and it is considered extremely rare along the Adriatic coast where it has been found, so far, only in Puglia (Nimis 2016).

S. Caporale

References

- Aguilar-Rosas R, Aguilar-Rosas LE, Hiroshi K, NiNi W (2010) First report on the Japanese species *Grateloupia lanceolata* (Okamura) Kawaguchi and *Grateloupia turuturu* Yamada (Halymeniaceae, Rhodophyta) in Baja California, Mexico. XX International Seaweed Symposium, Ensenada, Baja California, México. International Seaweed Association and Universidad Autónoma de Baja California, México, 112–113.

- Aleffi M, Tacchi R, Cortini Pedrotti C (2008) Check-list of the Hornworts, liverworts and Mosses of Italy. *Bocconea* 22: 5–254.
- Anzi M (1866) Neosymbola lichenum rariorum vel novorum Italiae superioris. *Atti della Società Italiana di Scienze Naturali di Milano* 9: 241–258.
- Araújo R, Bárbara I, Santos G, Rangel M, Sousa Pinto I (2003) Fragmenta Chorologica Occidentalia, Algae, 8572-8640. *Anales del Jardín Botánico de Madrid* 60(2): 405–409.
- Baglietto F (1858) Enumerazione dei licheni di Liguria. *Memorie della Reale Accademia delle Scienze di Torino, serie 2, 17*: 373–444.
- Baglietto F (1863) Escursione lichenologica dal Lago Maggiore al Sempione. *Commentarii della Società Crittogamologica Italiana* 1(4): 287–354.
- Baglietto F, Carestia A (1867) Catalogo dei licheni della Valsesia II. *Commentarii della Società Crittogamologica Italiana* 2(3): 321–434.
- Baglietto F, Carestia A (1880) Anacrisi dei licheni della Valsesia. *Atti della Società Crittogamologica Italiana* 2(2-3): 143–356.
- Bárbara I, Cremades J (2004) *Grateloupia lanceola* versus *Grateloupia turuturu* (Gigartinales, Rhodophyta) en la Península Ibérica. *Anales del Jardín Botánico de Madrid* 61: 103–118. doi: 10.3989/ajbm.2004.v61.i2.38
- Cecere E, Moro I, Wolf MA, Petrocelli A, Verlaque M, Sfriso A (2011) The introduced seaweed *Grateloupia turuturu* (Rhodophyta, Halymeniales) in two Mediterranean transitional water systems. *Botanica Marina* 54(1): 23–33. doi: 10.1515/bot.2011.009
- Craighero T (2010) Revisione tassonomica di alcuni gruppi critici del genere *Pertusaria* DC. (Ascomyceti lichenizzati) in Italia. – Thesis. Fac. of Sciences, Università di Trieste, 99 pp.
- D'Archino R, Nelson WA, Zuccarello GC (2007) Invasive marine red alga introduced to New Zealand waters: first record of *G. turuturu* (Halymeniaceae, Rhodophyta). *New Zealand Journal of Marine and Freshwater Research* 41: 35–42. doi: 10.1080/00288330709509894
- De Clerck O, Gavio B, Fredericq S, Bárbara I, Coppejans E (2005) Systematics of *Grateloupia flicina* (Halymeniaceae, Rhodophyta), based on rbcL sequence analyses and morphological evidence, including the reinstatement of *G. minima* and the description of *G. capensis* sp. nov. *Journal of Phycology* 41: 391–410. doi: 10.1111/j.1529-8817.2005.04189.x
- De Notaris G (1846) Prospetto della flora ligustica e dei zoofiti del mare ligustico. Tip. Ferrando, Genova. doi: 10.5962/bhl.title.6722
- De Notaris G (1847) Frammenti lichenografici di un lavoro inedito. Su alcuni generi delle Parmeliaceae. *Giornale Botanico Italiano* 2(1-2): 176–200.
- Falace A, Alongi G, Spagnolo A, Fabi G (2010) Segnalazione di macroalghe non indigene nel porto di Ancona (medio Adriatico). *Biologia Marina Mediterranea* 17(1): 300–301.
- Figuerola FL, Korbee N, de Clerck O, Bárbara I, Gall EAR (2007) Characterization of *Grateloupia lanceola* (Halymeniales, Rhodophyta), an obscure foliose *Grateloupia* from the Iberian Peninsula, based on morphology, comparative sequence analysis and mycosporine-like amino acid composition. *European Journal of Phycology* 42: 231–242. doi: 10.1080/09670260701327702
- Gheza G (2015) Terricolous lichens of the western Padanian Plain: new records of phytogeographical interest. *Acta Botanica Gallica* 162(4): 339–348. doi: 10.1080/12538078.2015.1108867

- Gheza G, Valcuvia Passadore M, Assini S (2015) Contribution to the knowledge of lichen flora of inland sand dunes in the western Po Plain (N Italy). *Plant Biosystems* 149(2): 307–314. doi: 10.1080/11263504.2013.823133
- Gheza G, Assini S, Valcuvia Passadore M (2016) Terricolous lichen communities of *Corynephorus canescens* grasslands of Northern Italy. *Tuexenia* 36: 121–142. doi: 10.14471/2016.36.005
- Grizel H, Héral M (1991) Introduction into France of the Japanese oyster (*Crassostrea gigas*). *Journal du Conseil International pour l'Exploration de la Mer* 47: 399–403. doi: 10.1093/icesjms/47.3.399
- Hardy FG, Guiry MD (2003) A check-list and atlas of the seaweeds of Britain and Ireland. British Phycological Society, London, 435 pp.
- Hodgetts NG (2015) Checklist and country status of European bryophytes - towards a new Red List for Europe. Irish Wildlife Manuals, No. 84. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland, 125 pp.
- Jatta A (1909-1911) *Flora Italica Cryptogama, pars III. Lichenes*. Tipografia Cappelli, Rocca di S. Casciano, 958 pp.
- Isochrona D, Matteucci E, Pivani F, Bottelli F, Piervittori R (2006) Indagini floristiche nelle Alpi Occidentali. I licheni della Conca di Oropa (Biella, Piemonte). *Allionia* 40: 25–30.
- Maggs CA, Stegenga H (1999) Red algal exotics on north sea coasts. *Helgoländer Meeresuntersuchungen* 52: 243–258. doi: 10.1007/BF02908900
- Mathieson AC, Pederson J, Dawes CJ (2008) Rapid assessment surveys of fouling and introduced seaweeds in the Northwest Atlantic. *Rhodora* 110: 406–478. doi: 10.3119/07-4.1
- Miller KA (2012) *Seaweeds of California. Updates of California Seaweed Species List*. University of California Jepson Herbarium, Berkeley, 1–59.
- Nimis PL (1993) *The lichens of Italy: an annotated catalogue*. Monografie XII. Museo Regionale di Scienze Naturali di Torino, 897 pp.
- Nimis PL (2016) *The Lichens of Italy. A Second Annotated Catalogue*. EUT, Trieste, 740 pp.
- Nimis PL, Martellos S (2008) ITALIC – the information system on Italian lichens – version 4.0. University of Trieste, Department of Biology, IN4.0/1. <http://dbiodbs.univ.trieste.it/italic/italic03> [accessed 15 October 2016]
- Nocca D, Balbis GB (1823) *Flora Ticinensis*. Tipografia Capelli, Pavia, 849 pp.
- Re GF (1825) *Flora Torinese*. Tipografia Del Bianco, Torino, 374 pp.
- Ribera Siguan MA (2002) Pathways of biological invasions of marine plants. In: Ruiz GM, Carlton JT (Eds) *Invasive Species: Vectors and Management Strategies*. USA Island Press, Washington, 183–226.
- Riouall R, Guiry MD, Codomier L (1985) Introduction d'une espèce folicée de *Grateloupia* dans la flore marine de l'étang de Thau (Hérault, France). *Cryptogamie, Algologie* 6: 1–98.
- Rivellini G, Valcuvia Passadore M (1996) I licheni appartenenti ai generi *Cladonia* e *Stereocaulon* in provincia di Sondrio (Lombardia, Italia settentrionale). *Il Naturalista Valtellinese – Atti del Museo Civico di Storia Naturale di Morbegno* 7: 3–32.
- Ros RM, Mazimpaka V, Abou-Salama U, Aleffi M, Blockeel TL, Brugués M, Cano MJ, Cros RM, Dia MG, Dirkse GM, El Saadawi W, Erdağ A, Ganeva A, González-Mancebo JM, Herrnstadt I, Khalil K, Kürschner H, Lanfranco E, Losada-Lima A, Refai MS, Rodríguez-Núñez S, Sabovljević M, Sérgio C, Shabbara HM, Sim-Sim M, Söderström L (2007)

- Hepatics and Anthocerotae of the Mediterranean, an annotated checklist. *Cryptogamie Bryologie* 28: 351–437.
- Ros RM, Mazimpaka V, Abou-Salama U, Aleffi M, Blockeel TL, Brugués M, Cros RM, Dia MG, Dirkse GM, Draper I, El Saadawi W, Erdağ A, Ganeva A, Gabriel R, Juan M, González-Mancebo JM, González-Mancebo, Granger C, Herrnstadt I, Hugonnot V, Khalil K, Kürschner H, Losada-Lima A, Luís L, Mifsud S, Privitera M, Puglisi M, Sabovljević M, Sérgio C, Shabbara HM, Sim-Sim M, Sotiaux A, Tacchi R, Vanderpoorten A, Werner O (2013) Mosses of the Mediterranean, an annotated checklist. *Cryptogamie Bryologie* 34: 99–283. doi: 10.7872/cryb.v34.iss2.2013.99
- Schaffelke B, Smith JE, Hewitt CL (2006) Introduced macroalgae - a growing concern. *Journal of Applied Phycology* 18: 529–541. doi: 10.1007/s10811-006-9074-2
- Scheidegger C (1993) A revision of European saxicolous species of the genus *Buellia* De Not. and formerly included genera. *The Lichenologist* 25: 315–364. doi: 10.1017/S0024282993000441
- Simon-Colin C, Ar Gall E, Deslandes E (2001) Expansion of the red alga *Grateloupia doryphora* along the coasts of Brittany (France). *Hydrobiologia* 443: 23–29. doi: 10.1023/A:1017587918604
- Smith AJE (2004) *The moss flora of Britain and Ireland* (2nd ed.) Cambridge University Press, 1012 pp. doi: 10.1017/CBO9780511541858
- Solazzi A, Curiel D, Chiozzotto E (1991/94) Flora macroalgale dei fondali mobili (paludi e velme) della laguna di Venezia. *Nova Thalassia* 12: 59–68.
- Puntillo D (1996) *I licheni di Calabria*. Monografie XXII. Museo Regionale di Scienze Naturali di Torino, 229 pp.
- Valcuvia Passadore M, Vittadini Zorzoli M (1982) Flora lichenica ligure. *Atti dell'Istituto Botanico e del Laboratorio Crittogamico dell'Università di Pavia, serie 7, 1*: 41–136.
- Verlaque M (2001) Checklist of the macroalgae of Thau Lagoon (Herauld, France): a hot spot of marine species introduction in Europe. *Oceanologica Acta* 24: 293–312.
- Verlaque M, Brannock PM, Komatsu T, Villalard-Bohnsack M, Marston M (2005) The genus *Grateloupia* C. Agardh (Halymeniaceae, Rhodophyta) in the Thau Lagoon (France, Mediterranean): a case study of marine plurispecific introductions. *Phycologia* 44: 477–496. doi: 10.2216/0031-8884(2005)44[477:TGGCAH]2.0.CO;2
- Villalard-Bohnsack M, Harlin M (1997) The appearance of *Grateloupia doryphora* (Halymeniaceae, Rhodophyta) on the northeast coast of North America. *Phycologia* 36: 324–328. doi: 10.2216/i0031-8884-36-4-324.1
- Wallentinus I (2002) Introduced marine algae and vascular plants in European aquatic environment. In: Leppäkoski E, Gollasch S, Olenin S (Eds) *Invasive Aquatic Species of Europe, Distribution, Impacts and Management*. Kluwer Academic Publishers, Dordrecht, 27–52. doi: 10.1007/978-94-015-9956-6_4
- Wirth V, Hauck M, Schultz M (2013) *Die Flechten Deutschlands*. Ulmer, Stuttgart, 1244 pp.
- Yoshida T (1998) *Marine Algae of Japan*. Uchida Rokakuho Publ., Tokyo, 1222 pp.
- Xia BM (2004) *Flora algarum marinarum sinicarum, Tomus II Rhodophyta No. III Gelidiales, Cryptonemiales, Hildenbrandiales*. Science Press, Beijing, 203 pp.
- Zodda G (1909) *Notizie briologiche sull'Italia meridionale*. *Malpighia* 23: 23–54.
- Zodda G (1913) *Studio biogeografico sulla Basilicata e catalogo delle briofite di questa provincia sin oggi conosciute*. *Nuovo Giornale Botanico Italiano* 20: 155–232.