Cryptogamie, Bryologie, 2009, 30 (3): 395-398

New interesting records to the moss flora of Sicily (Italy)

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(Received 27 January 2009, accepted 20 May 2009)

Abstract – The discovery on the Mt Etna of some species of *Grimmia* which are rare or very rare in Italy is reported. *Grimmia fuscolutea* and *G. alpestris* are new to Sicily, and the occurrence of *G. elatior* in this island is confirmed after one century from its previous reports.

Grimmia* / *G. fuscolutea* / *G. alpestris* / *G. elatior* / Mt Etna / Sicily / *Grimmietum elatioris

Grimmia is known to be one of the most diverse and rich moss genus in Europe and worldwide (Muñoz & Pando, 2000). It is mostly spread in mountainous areas, and is especially diverse at high latitudes in the northern hemisphere. In Europe 39 species of *Grimmia* are known (Hill *et al.*, 2006), of which 33 occur in Italy and 19 of them in Sicily (Aleffi *et al.*, 2008). In particular, on the Mount Etna a significant contingent represented up to now by 11 species, is found and the Sicilian locality of some of these species only is in this volcano (Privitera & Puglisi, 1996, 1997, 2002).

This Quaternary volcano is located in the centre of the Mediterranean region between 37°30' and 37°56'N and 14°44' and 15°14'E. Geologically it is mainly made of Pleistocene volcanic rocks with tholeitic and alkaline basalts. The localities where the species were found fall in the mountain area and are subject to humid Mediterranean climate with mean annual temperatures of 7.4°C and annual precipitations of 1250 mm (Brullo *et al.*, 1996), data referred to the nearest meteorological station of Casa Cantoniera (1882 m a.s.l.).

This paper is based on a revision of *Herbarium* material of *Grimmia* from Mt Etna. Such a material was collected by the author in the spring of the years 1991-1994, and the corresponding specimens are kept in the Herbarium of the Department of Botany of the University of Catania (CAT).

The nomenclature follows Hill *et al.* (2006). The threat category for each species has been evaluated applying the criterion B (restricted area of occupancy, few localities and decline) and using the new categories defined by the IUCN (2001, 2003, 2006).

Grimmia fuscolutea Hook.

SICILY: Mt Etna, Mts Silvestri, southern slope, 37°41'58'' N 15°00'18'' E, 1920 m, 22 May 1991, CAT, *Puglisi.*

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Grimmia fuscolutea was found on Mts Silvestri, secondary craters of the Mount Etna today partially covered by lava (Fig. 1). Here it grows in the area of *Astragaletum siculi* Poli 1965), where it forms dense, yellowish-green tufts, blackish inside, on volcanic rocks. This rare species was found fruited and mixed to *Grimmia elatior*, *Dicranoweisia crispula* (Hedw.) Milde and *Mielich-hoferia elongata* (Hoppe *et* Hornsch. ex Hook.) Hornsch.

It is a subarctic-alpine species occurring in Europe only in Norway, Austria, Switzerland, Slovakia (Muñoz & Pando, 2000). In Italy the species has been signalled for Trentino Alto Adige, Val d'Aosta and Piedmont (Fig. 2), the last two regions with reports dating back more than one century ago (Aleffi *et al.*, 2008). This report from Mt Etna marks the new southern-most border of its European range.

This species adds to the exiguous number of arctic-alpine bryophyte up to now signalled for Sicily, most of which found on the Mt Etna, such as *Grimmia torquata* Drumm., *Brachytheciastrum collinum* (Schleich. *ex* Müll. Hal.) Ignatov & Huttunen, *Tortula hoppeana* (Schultz) Ochyra, *Mielichhoferia elongata*, *M. mielichhoferiana* (Funck) Loeske (Privitera & Puglisi, 1997, 2002). For these species the Mt Etna represented a refuge during the last glacial period and so, at present, they can be considered the most interesting glacial relicts among the Sicilian bryophyte flora.

Threat category for Italy: CR (Critically Endangered). Previously the species was considered Extinct (Cortini Pedrotti & Aleffi, 1992).

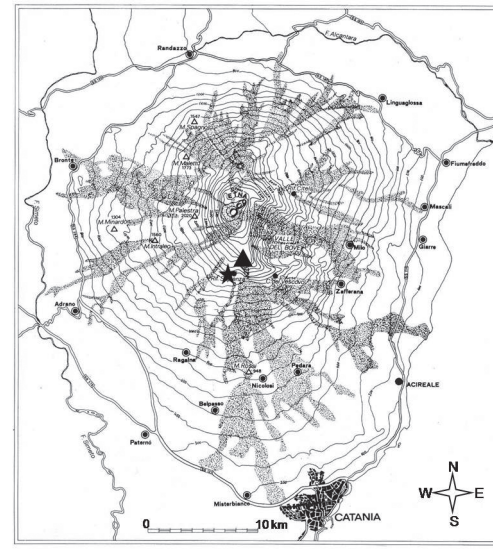

Fig. 1. Italian distribution of *Grimmia* fuscolutea. ● old reports (before 1950), ■ recent report (after 1950); ▲ new report.

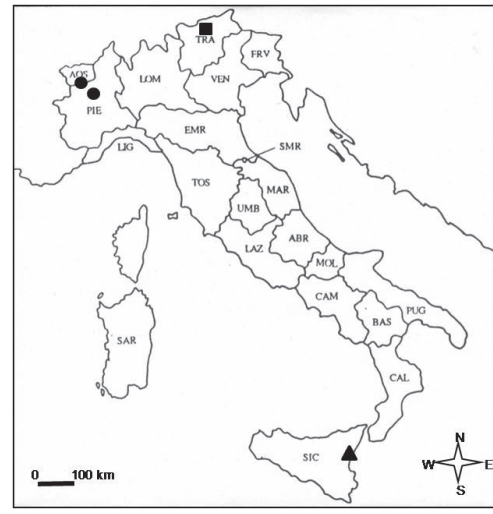

Fig. 2. Italian distribution of *Grimmia alpestris*. ● old reports (before 1950), ■ recent reports (after 1950); ★ new report.

Grimmia alpestris (F. Weber *et* D. Mohr) Schleich.

SICILY: Mt Etna, Aetnean Botanical Garden "Nuova Gussonea", southern slope, 37°41'28"N 14° 58'36'' E, 1730 m, 20 June 1992, CAT, *Puglisi*.

Grimmia alpestris was found with abundant sporophytes in the mountain belt of Mt Etna, growing in dark green cushions on dry and exposed rocks together with *Ceratodon purpureus* (Hedw.) Brid., *Grimmia donniana* Sm., *G. montana* Bruch *et* Schimp. and *Coscinodon cribrosus* (Hedw.) Spruce. It is a boreal-montane species quite common in Europe (Muñoz & Pando, 2000). In Italy it is known from some northern regions and Sardinia (Aleffi *et al.*, 2008) (Fig. 3). No report is known for the central and southern regions of Continental Italy nor from Sicily; therefore, this record represents a new addition to the Sicilian moss flora, and marks the new southernmost border of the Italian range of this species.

Threat category for Italy: VU (Vulnerable).

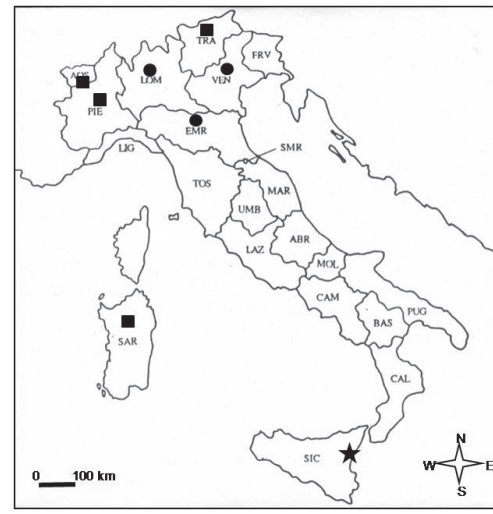

Fig. 3. Location of the new localities of *G. fuscolutea* (▲) and *G. alpestris* (★) on Mt Etna.

Table 1. *Grimmietum elatioris* Gams 1927 from Mt Etna

Number of relevés	1	2	3	4	5
Surface (dm^2)	4	3	4	5	3
Cover (%)	30	65	50	50	45
Inclination (°)	80	60	70	70	80
Exposition	N	NW	N	N	NE
Number of species	5	5	4	6	3
Characteristic species of association					
Grimmia elatior	2	3	3	3	2
Characteristic species of alliance (*Andreaeion petrophilae*)					
Dicranoweisia crispula	.	.	+	1	1
Grimmia donniana	1	.	.	.	.
Grimmia fuscolutea	.	.	1	.	.
Characteristic species of order and class (*Grimmietalia alpestris, Grimmietea alpestris*)					
Racomitrium heterostichum	1	2	.	+	2
Orthotrichum rupestre	.	1	.	+	.
Schistidium flaccidum	+	1	.	.	.
Other species					
Ceratodon purpureus	1	+	.	1	.
Mielichhoferia elongata	.	.	+	+	

Relevés origin. - Rel. 1, 2 Entrance of Demanio Forestale; rel. 3-5 Mts Silvestri.

Grimmia elatior Bruch *ex* Bals.-Criv. *et* De Not.

SICILY: Mt Etna, Entrance of Demanio Forestale (southern slope), 37°41'20'' N 15°05'13'' E, 1660 m, 22 May 1991, *Puglisi* (CAT), Mts Silvestri (southern slope), 1920 m, 15°00'18'' E, 37°41'58'' N, 22 May 1991, *Puglisi* (CAT).

The species was found in loose, disintegrating dark green patches, blackish below, on little exposed and dry rocks in two localities: at Entrance of Demanio Forestale, mixed to *Schistidium flaccidum* (De Not.) Ochyra, *Grimmia donniana*, *Racomitrium heterostichum* (Hedw.) Brid., *Orthotrichum rupestre* Schleich. *ex* Schwägr. and *Ceratodon purpureus*, and at Mts Silvestri, together with *Grimmia fuscolutea*, *Dicranoweisia crispula*, *Orthotrichum rupestre*, *Mielichhoferia elongata*, *Racomitrium heterostichum* and *Ceratodon purpureus*. *Grimmia elatior* is a circumpolar-boreal-montane species, known in Italy from some northern regions, from Sardinia and Sicily (Aleffi *et al.*, 2008). In Sicily, it was previously signalled for the Mts Caronie (Bottini, 1907) and Mts Peloritani (Zodda, 1907); so its occurrence is here confirmed after one century from its previous citations.

Threat category for Italy: VU (Vulnerable).

In the Etnean localities, it was possible to recognize *Grimmietum elatioris* Gams 1927 (Table 1), a saxicolous, acidophilous meso-xerophilous, photo-sciophilous, montane to alpine association preferring north facing, acid rocks. This association is here reported for the first time from Italy.

REFERENCES

ALEFFI M., TACCHI R. & CORTINI PEDROTTI C., 2008 — Check-list of the Hornworts, Liverworts and Mosses of Italy. *Bocconea* 22: 1-255.

BOTTINI A., 1907 — Sulla Briologia delle isole italiane. *Webbia* 2: 345-402.

BRULLO S., SCELSI F., SIRACUSA G. & SPAMPINATO G., 1996 — Caratteristiche bioclimatiche della Sicilia. *Giornale botanico italiano*, 130 (1): 177-185.

CORTINI PEDROTTI C. & ALEFFI M., 1992 — Lista rossa delle Briofite d'Italia. *In*: Conti F., Manzi A., Pedrotti F. (eds), *Libro rosso delle piante d'Italia*. Roma. pp. 559-637

DÜLL R., 1984 — Distribution of the European and Macaronesian mosses (*Bryophytina*). Part I. *Bryologische Beiträge* 4: 1-113.

HILL M. O. & PRESTON C. D., 1998 — The geographical relationship of British and Irish bryophytes. *Journal of bryology* 20: 127-226.

HILL M.O., BELL N., BRUGGEMAN-NANNENGA M.A., BRUGUÉS M., CANO M.J., ENROTH J., FLATBERG K.I., FRAHM J.-P., GALLEGO M.T., GARILLETI R., GUERRA J., HEDENÄS L., HOLYOAK D.T., HYVÖNEN J., IGNATOV M.S., LARA F., MAZIMPAKA V., MUÑOZ J., SÖDERSTRÖM L., 2006 — Bryological Monograph. An annotated checklist of the mosses of Europe and Macaronesia. *Journal of bryology* 28: 198–267.

IUCN, 2001 — *IUCN Red List Categories and Criteria. Version 3.1*. IUCN Species Survival Commission. Gland, Switzerland and Cambridge, U.K, IUCN, 30 p.

IUCN, 2003 — *Guidelines for Application of IUCN Red List Criteria at Regional Levels: Version 3.0*. IUCN Species Survival Commission. Gland, Switzerland and Cambridge, UK, IUCN.

IUCN, 2006 — *Guidelines for Using the IUCN Red List Categories and Criteria. Version 6.2*. Prepared by the Standards and Petitions Working Group of the IUCN SSC Biodiversity Assessments Sub-Committee in December 2006. Downloadable from http://app.iucn. org/webfiles/doc/SSC/RedList/RedListGuidelines.pdf.

MUÑOZ J. & PANDO F., 2000 — A world synopsis of the genus Grimmia (Musci, Grimmiaceae). *Monographs in systematic botany from the Missouri Botanical Garden* 83, 133 p.

PRIVITERA M. & PUGLISI M., 1996 — La vegetazione briofitica dell'Etna (Sicilia, Italia). *Braun-Blanquetia* 19. 59 pp.

PRIVITERA M. & PUGLISI M., 1997 — Noteworty orophilous mosses from Mount Etna (Sicily). *Bocconea* 5 (2): 905-911.

PRIVITERA M. & PUGLISI M., 2002 — Some interesting records for the Italian moss flora. *Cryptogamie, Bryologie* 23 (2): 171-179.

ZODDA G., 1907 — Le Briofite del messinese. II. *Annali di botanica* 6 (2): 237-269.