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The first record of *Bryum tenuisetum* Limpr. (*Bryaceae*) for Italy and southern Europe

Abstract

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The first record of *Bryum tenuisetum* for Italy and southern Europe was made on Etna (Sicily) during a research project on terrestrial bryophyte communities. A morphological description, illustration, ecology and distribution are presented.

The genus *Bryum* comprises c. 800 species widespread both in the northern and southern hemispheres, though America is its centre of diversity, followed by tropical Africa and Europe.

In Italy, 47 specific and 9 infraspecific taxa are recorded; some species are broadly distributed in the whole territory, e.g.: *Bryum argenteum* Hedw., *B. bicolor* Dicks., *B. caespiticium* Hedw., *B. capillare* Hedw., *B. pseudotriquetrum* (Hedw.) P. Gaertn. & al., *B. torquescens* Bruch & Schimp., etc; other species have a restricted or scattered distribution, possibly because they are misunderstood or unrecorded, e.g.: *Bryum calophyllum* R. Br., *B. cellulare* Hook., *B. klinggraffii* Schimp., *B. sauteri* Bruch. & al., *B. stirtonii* Schimp., *B. dunense* A. J. E. Sm. ex Whitehouse, *B. gemmilucens* Wilcz. & Dem. (the later recently discovered in Sicily, see Lo Giudice 1996); finally other species should be excluded from the Italian bryoflora since their identifications are uncertain or erroneous, e.g.: *B. mamillatum* Lindb. and *B. warneum* (Röhl.) Blandow (Cortini Pedrotti 1992).

The genus is taxonomically difficult and the excellent results achieved by studies on critical groups (Crundwell & Nyholm 1964, Whitehouse 1966, Wilczek & Demaret 1974, 1976a, 1976b, Smith & Whitehouse 1978, etc.) emphasize the need for a monographic study of the genus *Bryum*. Many species have been reduced to synonymy, while other species have been shown to consist of aggregates or complexes of more species or infraspecific taxa.

In May 1995, during a research programme on terricolous bryophytic vegetation on the Etna (east Sicily), we collected a species belonging to the *Bryum erythrocarpum* complex which had not been reported in the checklist of Italian mosses (Cortini Pedrotti l. c.) and identified as *Bryum tenuisetum* Limpr.

This species as well as others of the *Bryum erythrocarpum* complex is characterized by the regular possession of rhizoidal gemmae. The species of the *Bryum erythrocarpum* complex traditionally recognized are: *Bryum radiculosum* Brid., *B. ruderale* Crundw. & Nyholm, *B. violaceum* Crundw. & Nyholm, *B. klinggraeffii* Schimp., *B. sauteri* Bruch & al., *B. bornholmense* Winkelm. & Ruthe, *B. microerythrocarpum* C. Müll. & Kindb., *B. rubens* Mitt., *B. subapiculatum* Hampe, besides *Bryum tenuisetum* Limpr. Recently, some bryologists (Touw & Rubers 1989, Stieperaere in litt.) do not accept the specific status of *Bryum microerythrocarpum* and regard it as a synonym of *B. rubens*. Certainly, further taxonomic studies are needed to elucidate the correct status of these species, as well as *Bryum subapiculatum* Hampe, also considered a synonym of *B. rubens* (Dirkse & al. 1989).

As regards the Italian territory, the species presently belonging to *Bryum erythrocarpum* complex are: *Bryum klinggraeffii*, *B. radiculosum*, *B. rubens*, *B. ruderale*, *B. sauteri* and *B. tenuisetum*.

Voucher specimens of *B. tenuisetum* are kept in the herbarium of Botanical Department of Catania (CAT).

Description (Fig. 1)

Bryum tenuisetum Limpr. (syn.: *B. klinggraeffii* Schimp. subsp. *tenuisetum* (Limpr.) Podp.).

Dioecious, very rarely synoecious. Plants 3-10 mm long. Rhizoids brown, brown-red, papillose. Leaves 1-2.5 mm long, ovate-lanceolate or elliptical, acute, plane or slightly recurved, denticulate near the tip, nerve strong, excurrent, becoming purple with age, mid-leaf cells 40-100 x 10-18 μm , longer and narrower at margin, hardly forming a border. Rhizoidal gemmae abundant on long rhizoids, pyriform, subspherical to slightly angled, yellowish or orange 120-180 (240) μm diameter, with cells more or less protuberant; never axillary gemmae or clustered at the base of the stem. Capsule narrowly ellipsoid, 1.5-2 mm long, purple-red. Outer peristome teeth free, papillae of inner peristome slightly crescent-shaped. Spores glossy, yellow, 10-15 μm diameter. Seta 10-25 mm long, purple.

The plants from Etna are 5-10 mm high, the leaves are 0.8-1.3 mm long. The rhizoidal gemmae are subspherical, very rarely pyriform, yellowish or at times brownish-yellow of 170-200 μm diameter. Moreover, the Sicilian specimens bear capsules, which are 2.2 mm long, while the seta is 17-20 mm.

Relationship with other species of *Bryum erythrocarpum* complex

Bryum tenuisetum is a species similar to *Bryum klinggraeffii*; it differs by the rhizoidal gemmae having several more or less protuberant cells.

It is also similar to *Bryum demaretianum* Arts which has pyriform multi-celle gemmae, yellow-ochre or orange-brown. *B. tenuisetum* differs from it in pale yellow or orange gemmae, broader (c.200 μm diameter) and less numerous. *B. tenuisetum* is most closely related to *B. rubens* but differs from it not only in the smaller yellow gemmae but also in some sporophyte characters: processes widely perforated of the inner peristome, spores glossy, wider.

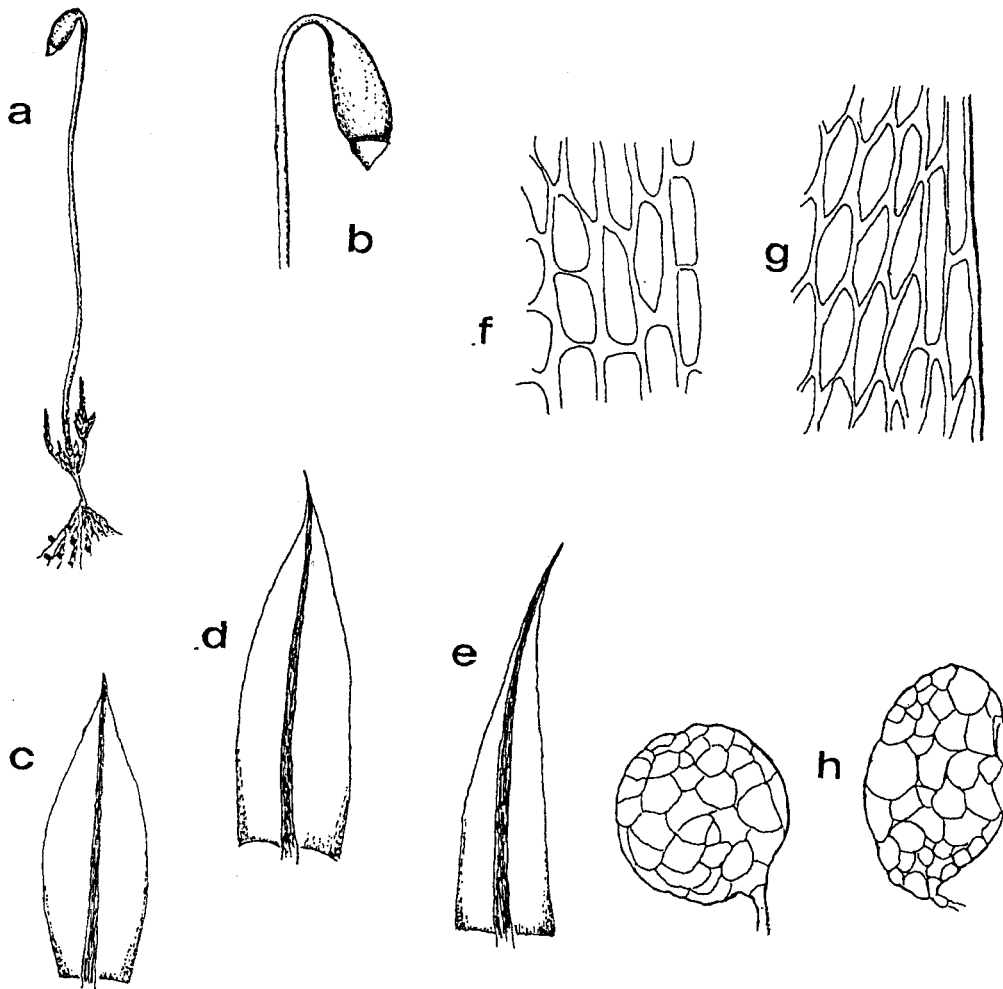


Fig. 1. **a**, whole plant (x 2); **b**, capsule (x 10); **c**, **d**, leaves (x 40); **e**, perichaetial leaf (x 40); **f**, basal cells (x 400); **g**, cells at margin above (x 400); **h**, gemmae (x 120).

General distribution

Bryum tenuisetum is a suboceanic-montane moss recorded in Europe from Austria, Belgium, Great Britain, Czechoslovakia, Denmark, Finland, France, Germany, Ireland, Iceland, Poland, also from Soviet Union -Baltic Countries- (Düll 1984-85). Recently other records have been reported by Düll (1992) in Europe: Norway, Sweden, Netherlands. In addition to cited areas, *Bryum tenuisetum* also occurs in Africa (Canary is.), and Nord America (Düll 1984-85, Demaret 1993).

Italian distribution

So far *Bryum tenuisetum* is only known in Sicily from the collecting locality: on lava soil, near Vena, (37°47'37''N x 15°08'08''E), 810 m, Etna volcano East side, Sicily.

Ecology of *Bryum tenuisetum*

Bryum tenuisetum is a terricolous calcifuge moss growing in open places on peaty soils or damp sandy or clayey ground, more rarely in arable fields, oat stubble or heaths fired (Smith 1978, Clément & Touffet 1988, Lecointe 1990, Demaret 1993, Bates & Hodgetts 1995).

The plants gathered on Mt Etna have been found in scattered tufts in a depression between lava outcrops at an altitude of 810 m (pH values ranging from 4.5 to 5).

The collecting area is in a territory marked out by lavaflows produced mainly by the eruptive centres belonging to "Mongibello antico" (Romano & al. 1978). The lavaflow surface layer is made up of alkalic basalts, hawaiites, phonolitic tephrites, basic mugearites. Moreover the lavaflows are now intensively cultivated, as previously.

As regards the climate, we refer to the data (1967-1986) of the nearest station to the collecting locality: Zafferana Etnea (590 m). The annual precipitation is 1169 mm with a maximum in December; while the mean annual value of the temperature is 16°C. Using the classification of Rivas Martinez (1981), the territory belongs to the bioclimatic mesomediterranean belt with a humid climate. Apart from the dominant species, *Genista aetnensis* (Biv.) DC., the phanerogamic vegetation is composed of herbaceous species that are frequent in ephemeral pioneer communities of the *Tuberarietea guttatae* Br.-Br. 1952 em. Rivas-Martinez 1977 like *Briza maxima* L., *Aira caryophyllea* L., *Oglifa gallica* (L.) Chrtk. & Holub., *Ornithopus compressus* L., *Galium parisiense* L., besides *Sedum stellatum* L., *Umbilicus rupestris* (Salisb.) Dandy, *Micromeria graeca* (L.) Bentham. Bryophytes associated with *Bryum tenuisetum* comprise characteristic species of the *Phascion cuspidatae* Waldheim 1947, alliance of the *Barbuletea unguiculatae* Hübbsmann including mesoxerophilous and the more or less nitrophilous communities of cultivated fields (*Pleuridium acuminatum* Lindb., *Riccia glauca* L., *Phascum cuspidatum* Hedw.), besides other terricolous species (*Pleuridium subulatum* (Hedw.) Rabenh., *Bartramia pomiformis* Hedw., *Bryum argenteum* Hedw. var. *lanatum* (P. Beauv.) Hampe).

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