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A second record of *Pterygoneurum subsessile* (Brid.) Jur. in Italy

Abstract

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The discovery of *Pterygoneurum subsessile* was made in a very xeric area of southern Sicily during a research project on terrestrial bryophyte communities. *P. subsessile* had been previously reported in Trentino-Alto Adige near the Austrian border. In addition new localities for *Pterygoneurum ovatum* (Hedw.) Dix. are given. A description, illustration, ecology and distribution of *P. subsessile* is presented.

The genus *Pterygoneurum* comprises small, generally bulbiform mosses, gregarious or densely tufted. The leaves are very concave, broadly oblong-ovate or elliptic, with lamellae on the ventral surface of the costa. The capsule, usually stegocarpous, can be immersed or exserted (Smith 1978, Zander 1993).

The genus is closely related to the genera *Crossidium* and *Aloina*, but these have filaments on the costa, while *Pterygoneurum* has lamellae.

Recently Guerra & al. (1995) revised *Pterygoneurum*, recognizing eight species in the world: *Pterygoneurum subsessile* (Brid.) Jur., *P. ovatum* (Hedw.) Dix., *P. lamellatum* (Lindb.) Jur., widely distributed, especially in the northern hemisphere; *P. sampaianum* (Mach.) Mach., considered by some bryologists (Corley & al. 1981) a weakly delimited species, with Mediterranean continental distribution; *P. crossidioides* Frey, Herrstadt & Kürschner, known so far from Dead Sea area and Iberian Peninsula; *P. compactum* Cano, Guerra & Ros and *P. californicum* Crum, endemic species of Iberian Peninsula and of California respectively; *P. macleanum* Warnst. (= *P. kemsleyi* Willis) with austral distribution. According to Guerra & al. (l.c.) some taxons with cleistocarpous capsule, included in the genus *Pterygoneurum* such as *P. smardeanum* Vanek or *P. koslovii* Laz., should be placed in another genus.

In spring 1996 during a research programme on terrestrial bryophytic vegetation carried out on the cork-oak woods in central-southern Sicily, a very small moss was discovered almost entirely immersed in the sandy soil among *Helianthemum sanguineum* (Lag.) Dunal populations, a very rare member of *Cistaceae* in the Mediterranean area (see Galesi 1995).

This moss has been easily identified as *Pterygoneurum subsessile* by the leaves with lamellae and the immersed capsule.

In the Italian territory, besides *P. subsessile*, the genus *Pterygoneurum* is represented by *P. ovatum* and *P. lamellatum*.

Voucher specimens of *P. subsessile* are preserved in the herbaria of the Botanical Departments of Catania (CAT) and Palermo (PAL).

Key to the Italian species of the genus *Pterygoneurum*

- 1 - Sporophyte immersed, calyptra mitrate; leaves terminating in a hyaline long serrulate awn.....*Pterygoneurum subsessile*
 - Sporophyte exerted, calyptra cucullate; leaves ending in a hyaline smooth or nearly smooth hair point 2
 2 - Rudimentary peristome, operculum obliquely rostrate with cells in spiral rows, spores 15-30 μm , slightly papillose.....*Pterygoneurum lamellatum*
 3 - Peristome lacking, operculum obliquely rostrate with cells in straight rows, spores 20-45 μm , papillose.....*Pterygoneurum ovatum*

Description of *Pterygoneurum subsessile* (Brid.) Jur. (Fig. 1)

Small plants in dense, hoary tufts, up to 5 mm high. Leaves 1.5-2 mm long, concave, sometimes cucullate, elliptic or oblong-ovate, abruptly narrowed to a hyaline, serrulate awn; margin plane, entire or serrulate at or near the base of the awn, upper and medium cells about 10-14 \times 10-18 μm , smooth; nerve with 2-4 green lamellae. Autoicous. Setae 0.5-1 mm long; capsule immersed, globose or subglobose, 0.5-1 mm long, brown or dark-brown, strongly and irregularly wrinkled when dry; annulus none; peristome none; spores 31-50 μm , very papillose; calyptra mitrate.

The capsules of the Sicilian specimens are 0.7-0.8 mm long, the spores 25-30 μm .

General distribution

P. subsessile is a continental moss with a nearly worldwide distribution. It is recorded in Europe from Austria, Czechoslovakia, Germany, Switzerland, Spain, Hungary, Poland, Romania, Russia (C. & S.W. region, Caucasus) Krym. In addition *P. subsessile* occurs in Northeast, Central and Southwestern Asia; North Africa; and North, Central, Southern South America (Düll 1984).

Italian distribution (Fig. 2)

P. subsessile was found for the first time in Italy in 1882 in an area between Ponte Gardena (Waidbruch) and Campodazzo (Atzwang) near Bolzano (Trentino-Alto Adige) on porphyritic rocks "An sonnigen Porphyrfelsen zwischen Waidbruch und Atzwang" (Dalla Torre & Sarnthein 1904). This record is also reported by Gams (1934) in the work "Beiträge zur Kenntnis der Steppenmoose". We have not seen the specimens from Trentino-Alto Adige deposited in the private herbarium of F. Sauter.

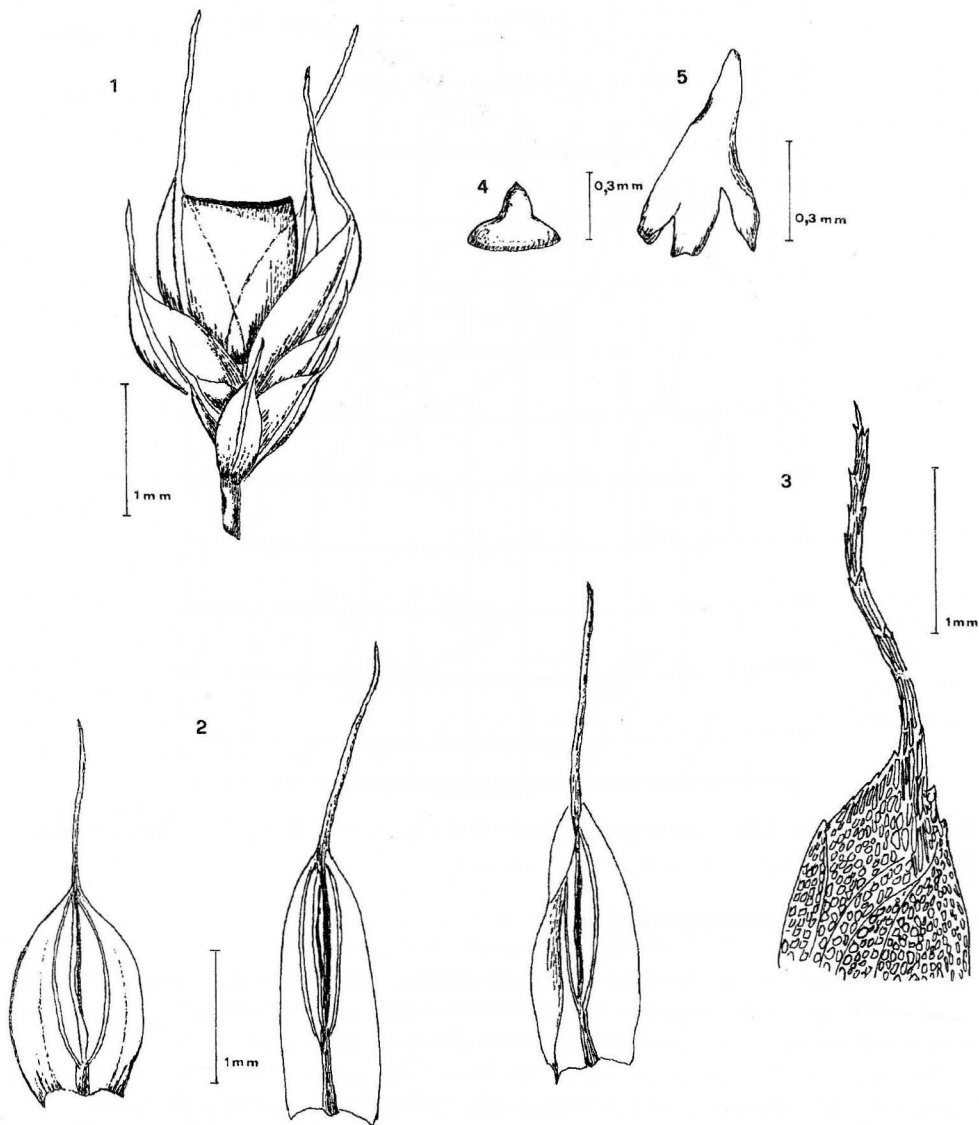


Fig. 1. *Pterygoneurum subsessile* (Brid.) Jur. (from Sicilian specimens): 1, habit; 2, leaves; 3, leaf apex; 4, lid; 5, calyptra.

In Sicily *P. subsessile* has been gathered on sandy soil in "Piano Stravolata", 230 m (37°24'00"N, 14°26'12"E), and "Condrada Arcia", 240 m (37°24'00"N, 14°23'31"E) near Niscemi. This record extends the species distribution area to extreme South Europe.



Fig. 2. Distribution of *Pterygoneurum subsessile* (Brid.) Jur. in Italy: ● data from literature, ■ new Sicilian stations.

Ecology of *Pterygoneurum subsessile*

P. subsessile is a xerophilous, photophilous, thermophilous, terricolous and loessiphilous species belonging to the continental steppe group (Giacomini 1951). It lives in areas with an arid or semiarid climate on dry clayey or sandy soil.

This species, as well as the other species of the genus *Pterygoneurum*, presents mechanisms of adaptation to arid conditions like hyaline hairs, papillae and lamellae.

In Sicily it has been collected in open areas within the cork-oak woods on non calcareous sediments (reaction with HCL 1/2 negative).

From the geological point of view the outcrops are composed here of Pliocene deposits including mainly sandstone (88.6 %), besides the clay and silt.

Referring to the data from the nearby meteorological station (Caltagirone, 513 m) the average annual precipitation is 540 mm and the average temperature 17.7° C, which corresponds to the bioclimatic thermomediterranean belt with a dry climate (Rivas Martinez 1981). On the basis of personal observations, the collecting areas (Piano

Stravolata and Condrada Arcia) are characterized by a more arid climate than the station of Caltagirone.

Apart from *Helianthemum sanguineum*, the phanerogamic vegetation is composed of typical species of sandy soil that are frequent in ephemeral pionier communities of the *Malcolmietalia* Rivas Goday 1957, order of the *Tuberarietea Guttatae* Br. - Bl. (1940) 1952 such as *Alkanna tinctoria* (L.) Tausch, *Coronilla repanda* (Poiret) Guss., *Erodium laciniatum* (Cav.) Willd., *Launaea resedifolia* (L.) Kuntze, *Loeflingia hispanica* L., *Lotus halophilus* Boiss. et Spr., *Maresia nana* (DC.) Batt., *Medicago litoralis* Rohde, *Polycarpon alsinifolium* (Biv.) DC., *Senecio coronopifolius* Desf.

P. subsessile is associated with *Aloina rigida* (Hedw.) Limpr., *Bryum bicolor* Dicks., *Crossidium crassinerve* (De Not.) Jur., *Crossidium squamiferum* (Viv.) Jur., *Tortula atrovirens* (Sm.) Lindb., *Pterygoneurum ovatum* (Hedw.) Dixon. The latter moss has been recorded the first for Sicily by Düll (1992) on Mt. Quacella (Madonie).

Similar bryophytic aspects have been reported by Brullo & al. (1991) in some desert and subdesert areas of Israel and referred to a new association: *Pterygoneuretum subsessile*, syntaxon of the *Aloino Crossidion crassinervis* Ros & Guerra 1987, alliance of the *Tortulo brevissimae-Aloinetalia bifrontis* Ros & Guerra 1987, including xerophilous communities of clayey, marl-clayey, gypsiferous or saline soils.

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