

## ***Syntrichia echinata* (Schiffn.) Herrnst. & Ben-Sasson (Pottiaceae, Bryopsida) new to Italy**

Patrizia CAMPISI<sup>a\*</sup>, María Teresa GALLEGO<sup>b</sup> and Maria Grazia LO RE<sup>a</sup>

<sup>a</sup>Dipartimento di Scienze Botaniche dell'Università di Palermo  
via Archirafi, 38 - 90123 Palermo (Italy)

<sup>b</sup>Departamento de Biología Vegetal (Botánica), Facultad de Biología,  
Universidad de Murcia, E-30100 Spain, E-mail: mgallego@um.es

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**Abstract** – *Syntrichia echinata* (Schiffn.) Herrnst. & Ben-Sasson, previously known in Europe only from Crete and Greece, is reported for the first time in Italy. It has been collected at Rocca Busambra in northern Sicily. Outside Europe, this Mediterranean montane species is distributed in south-western Asia. The principal distinctive characters that separate it from other *Syntrichia* species with pedicellate papillae, such as *S. minor*, *S. papillosissima* and *S. subpapillosissima* are discussed.

**Musci / *Syntrichia echinata* / *S. minor* / *S. papillosissima* / *S. subpapillosissima* / distribution / Sicily**

### INTRODUCTION

During the study of the Sicilian Natural Reserve “Bosco della Ficuzza, Rocca Busambra, bosco del Cappelliere e Gorgo del Drago” we have identified a specimen of *Syntrichia* Brid. whose singular leaf papilosity did not match any previously known species of this genus in Italy. After the study of several plants, we conclude that they correspond to *Syntrichia echinata* (Schiffn.) Herrnst. & Ben-Sasson, a Mediterranean-montane taxon distributed in Europe and South West Asia.

Schiffner (1915) described *Tortula echinata* from Crete on the basis of the smaller size of its gametophyte and sporophyte in comparison with *Syntrichia princeps* (sub *Tortula muelleri* Hook. f. & Wilson), and its higher and branched papillae. Later, Podpěra (1954) assigned this taxon to the genus *Syntrichia* as a subspecies of *S. princeps* (De Not.) Mitt. Soon afterwards, Bizot (1956) considered it as a variety of *Tortula princeps* De Not. Kramer (1980) reinstated it as a subspecies, but this time of *Tortula princeps*, while Zander (1993) considered it again as a variety of *Syntrichia princeps*. Finally, Herrnstadt *et al.* (1982) reinstated again it at the specific rank under the new combination *Syntrichia echinata*, since they considered the different type of papillae of the leaf laminal cells as an

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\* Correspondence and reprints: pcampisi@unipa.it

important taxonomic character. Recently, Gallego *et al.* (2002) stated that the number, length and shape of the lamina papillae are distinctive characters in the genus *Syntrichia*, constituting a good character for the separation of species.

## MATERIAL AND METHODS

**Specimens examined.** – ITALY. WESTERN-CENTRAL SICILY. Rocca Busambra, in the Natural Reserve “Bosco della Ficuzza, Rocca Busambra, bosco del Cappelliere e Gorgo del Drago”, 1143 m a.s.l., 37°51'53" N, 13°23'30" E, 16 Jan 2004, Campisi & Lo Re (PAL).

## RESULTS

### Description of Sicilian specimen

*Syntrichia echinata* (Schiffn.) Herrnst. & Ben-Sasson, *The bryologist* 85: 216. 1982 (Fig. 1)

Plants 1.5 cm high, reddish to brownish. Stems erect, branched. Leaves weakly spirally twisted and incurved when dry, erecto-patent when moist, 2.5-3.2 mm long, ovate-lingulate, obtuse, unistratose, weakly constricted at the middle; hair point hyaline, brown at base, 0.3-0.5 mm long, denticulate; margins recurved from base to the upper third; costa 80-100  $\mu\text{m}$  wide; in cross section with hydroids and 4-6 dorsal stereid rows, with simple or bifurcate papillae, (3)5-6.2  $\mu\text{m}$  high on the dorsal side; upper and middle laminal cells quadrate, (10)12.5-15  $\mu\text{m}$  wide, usually with 1, sometimes with 2 pedicellate and star-shaped papillae per cell, (6)10-12.5(17.5)  $\mu\text{m}$  high; juxtacostal basal cells rectangular, hyaline, 50-90  $\times$  15-25  $\mu\text{m}$ . Synoicous. Sporophytes not found.

**Ecology.** – The Sicilian specimen of *Syntrichia echinata* has been collected on exposed basic rock at 1143 m a.s.l. This is usual for this saxicolous Mediterranean species which is not known to occur above 2000 m. According to Rivas Martinez (1991) the area where this moss grows in Sicily corresponds to the meso-Mediterranean belt with a subhumid ombrotype.

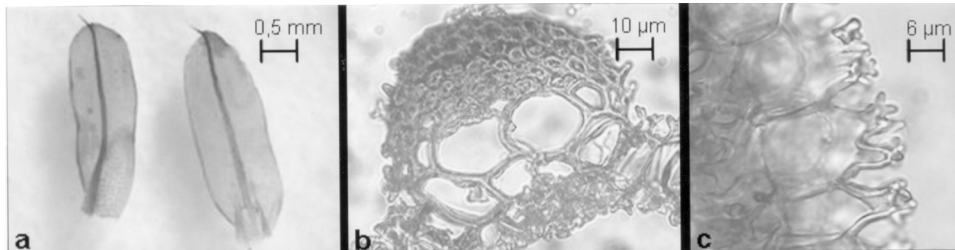


Fig. 1. *Syntrichia echinata* (from Sicilian specimen). **a:** Leaves. **b:** Cross section of the costa in the middle part. **c:** Detail of the papillae in cross section of the leaf at the middle part.

Table 1. Main morphological characters distinguishing *Syntrichia echinata* from other similar taxa.

	<i>S. echinata</i>	<i>S. minor</i>	<i>S. papillosissima</i>	<i>S. princeps</i>	<i>S. subpapillosissima</i>
<b>Leaf margins</b>	recurved up to the upper third	usually plane, sometimes slightly recurved up to midleaf	recurved up to the leaf apex, sometimes up to the upper third	recurved up to the upper third	recurved up to the leaf apex, sometimes up to the upper third
<b>Number of papillae in the upper and median laminal cells</b>	1-2	1	1	(4)6-12	(2)4-6
<b>Shape of papillae in the upper and median laminal cells</b>	Star-shaped, pedicellate	Star-shaped, pedicellate	Star-shaped, pedicellate	Bifurcate, not pedicellate	Bifurcate, rarely star-shaped, sometimes pedicellate
<b>Length of papillae in the upper and median laminal cells</b>	(6)12.5-17.5(22.5) $\mu\text{m}$	10-15(17.5) $\mu\text{m}$	(7.5)10-12.5(15) $\mu\text{m}$	2.5 $\mu\text{m}$	(5)7.5-10 $\mu\text{m}$
<b>Width of upper and median laminal cells</b>	12.5-15(17.5) $\mu\text{m}$	(7.5)10-12.5 $\mu\text{m}$	10-12.5 $\mu\text{m}$	12.5-15(17.5) $\mu\text{m}$	(7.5)10-12.5 $\mu\text{m}$
<b>Hydroids in the costa</b>	present	lacking	lacking	present	lacking
<b>Sexuality</b>	synoicous	dioicous	dioicous	synoicous or dioicous	dioicous

## DISCUSSION

This species is mainly characterized by the presence of 1, sometimes 2 pedicellate and star-shaped papillae in the upper and median laminal cells, (6)12.5-17.5(22.5)  $\mu\text{m}$  high; the cross section of the costa with 3-7 dorsal stereid rows, with hydroids; the leaf margins recurved up to the upper third; the upper and middle laminal cells measuring (10)12.5-15  $\times$  (12.5)15-17.5  $\mu\text{m}$  and by the synoicous condition.

In the form of its leaf papillae, *Syntrichia echinata* is similar to *S. papillosissima* (Copp.) Loeske, reported from Italy (Cortini Pedrotti, 2001) and recently also recorded in Sicily (Lo Manto & Provenzano, 2004) and to *S. minor* (Bizot) M. T. Gallego, J. Guerra, M. J. Cano, Ros & M. C. Sánchez-Moya, which is unknown in Italy. These three taxa differ (Tab. 1) in their sexuality (*S. papillosissima* and *S. minor* are dioicous), the curvature of the leaf margins (*S. papillosissima* shows margins recurved up to the leaf apex, and in *S. minor* they are usually plane) and the size of the middle and upper laminal cells (*S. echinata* has wider laminal cells than *S. papillosissima* and *S. minor*). In addition, *Syntrichia echinata* sometimes exhibits more than one papilla per cell in the upper and middle laminal cells, whereas *S. papillosissima* and *S. minor* have only one, and

contrary to *S. papillosissima* and *S. minor*, it has hydroids in the costa section. Other species that may have pedicellate papillae is *Syntrichia subpapillosissima*, although this taxon usually has (2)4-6 bifurcate, rarely branched star-shaped papillae per cell, (5)7.5-10  $\mu\text{m}$  high. Moreover, *S. subpapillosissima* has not hydroids, presents upper and middle laminal cells  $10-12.5 \times (7.5)10-12.5 \mu\text{m}$ , and is dioicous.

*Syntrichia echinata* is also closely related to *S. princeps*, a widespread taxon in Sicily (Dia *et al.*, 1987), since they share the size of upper and middle laminal cells, leaf margins curvature, structure of the cross section of the costa and sexuality. However, these two taxa differs essentially in the type of leaf papillae, since *S. princeps* has (4)6-12 bifurcate, not pedicellate papillae per cell.

*Syntrichia echinata* has been reported from eastern Mediterranean area: Cyprus (Koppe, 1976), Greece (Crete, Schiffner, 1915), Israel (Herrnstadt *et al.*, 1982), Jordan (El-Oqlah *et al.*, 1988), Lebanon (Kramer, 1980) and Turkey (Walther, 1970). Therefore, the Sicilian record extends the distribution range of this taxon to the Central Mediterranean area.

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