

Phascum longipes sp. nov. on gypsum soils from Almería, Spain

J. GUERRA, J. J. MARTÍNEZ, R. M. ROS and J. S. CARRIÓN

Departamento de Biología Vegetal, Universidad de Murcia, Spain

INTRODUCTION

During a large research project on the bryophyte flora of the gypsum soils from the south of Spain, a taxonomic revision of the difficult genera *Phascum* and *Pottia* from the Iberian Peninsula was carried out. Many of the specimens collected could not be named and this paper presents the first results of our study of the genus *Phascum*, the description of a new species, *Phascum longipes*.

Phascum longipedis Guerra, Martínez & Ros sp. nov. (Figs. 1–3)

Planta parva, gregalis et paroica est atque eius caules rubescentes ac brevissimi, 0.5–1.2 mm. Huius plantae folia ovata-lanceolata sunt et generatim apiculata. Perichaetalia folia cum labris paucum recurvatis habet et haec folia mediocria, 0.8–1 mm in longitudinem. Areolatio in vertice vel superiore parte constituta est cellulis quadratis aut aliquid rectangularibus longis 7–10 × 12–14 μm; cellulae papillatae sunt cum 2–3(–4) papillis conicis aut bifurcis; in media parte cellulis hialinis formata est et rectangularibus longis, 30–60 × 18–20 μm; in inferiore parte cellulae etiam hialinae sunt longae, 50–70 × 20–22 μm. Capsula longa 1.4–1.6 mm, cleistocarpica, sine ullo vestigio peristomatis et rostrata. Pedunculus longus 1.5–2 mm, aliquid curvatus aut erectus. Cofias levis ac cucullata. Sporae etiam leves vel minime verrucosae.

TYPE: Spain, Almería, Sorbas, near Gafares, Lomilla de las Colmenas, WF8997, 200 m, 7 April 1988, Martínez & Ros (*Bryotheca MUB 3068*, HOLOTYPE).

Very small gregarious plants, 0.5–1.2 mm high. Stems reddish, without central strand. Leaves patent when moist, incurved when dry. Perichaetial leaves 0.8–1.0 mm long, ovate-lanceolate, apiculate, with sheathing base; margin narrowly recurved in the middle and upper part of the leaves but sometimes only in the middle part; nerve usually clearly excurrent or percurrent. Middle leaves with recurved margin in mid-leaf, plane above; nerve not excurrent, broader (ca 35 μm) than in the perichaetial leaves. Lower leaves 0.3–0.5 mm long, margin plane or slightly recurved, nerve scarcely or not excurrent. Cells isodiametric or shortly rectangular towards the upper part, 9–10 × 12–15 μm, papillose on both faces, each cell with two to three conic or more rarely bifurcate papillae; ventral cells over the nerve similar; mid-leaf cells rectangular, hyaline, 50–60 × 20–22 μm. Nerve in T.S. with epidermal cells and a few (1–3) central stereids. Pariocous, axillary antheridia in axils of middle leaves. Capsule emergent, cleistocarpous, yellowish, without trace of lid or peristome, ovoid-ellipsoid when young, almost cylindrical or cylindrical-ellipsoid

when mature, erect or nearly so, 1.4–1.6 mm long, rostrate, with basal superficial stomata; exothecial cells rectangular, 50–70 μm long. Seta up to 2.2 mm long. Calyptra cucullate, smooth, 0.9–1.0 mm long. Spores smooth or very slightly verrucose, 22–24 μm , usually polygonal in outline, sometimes spherical.

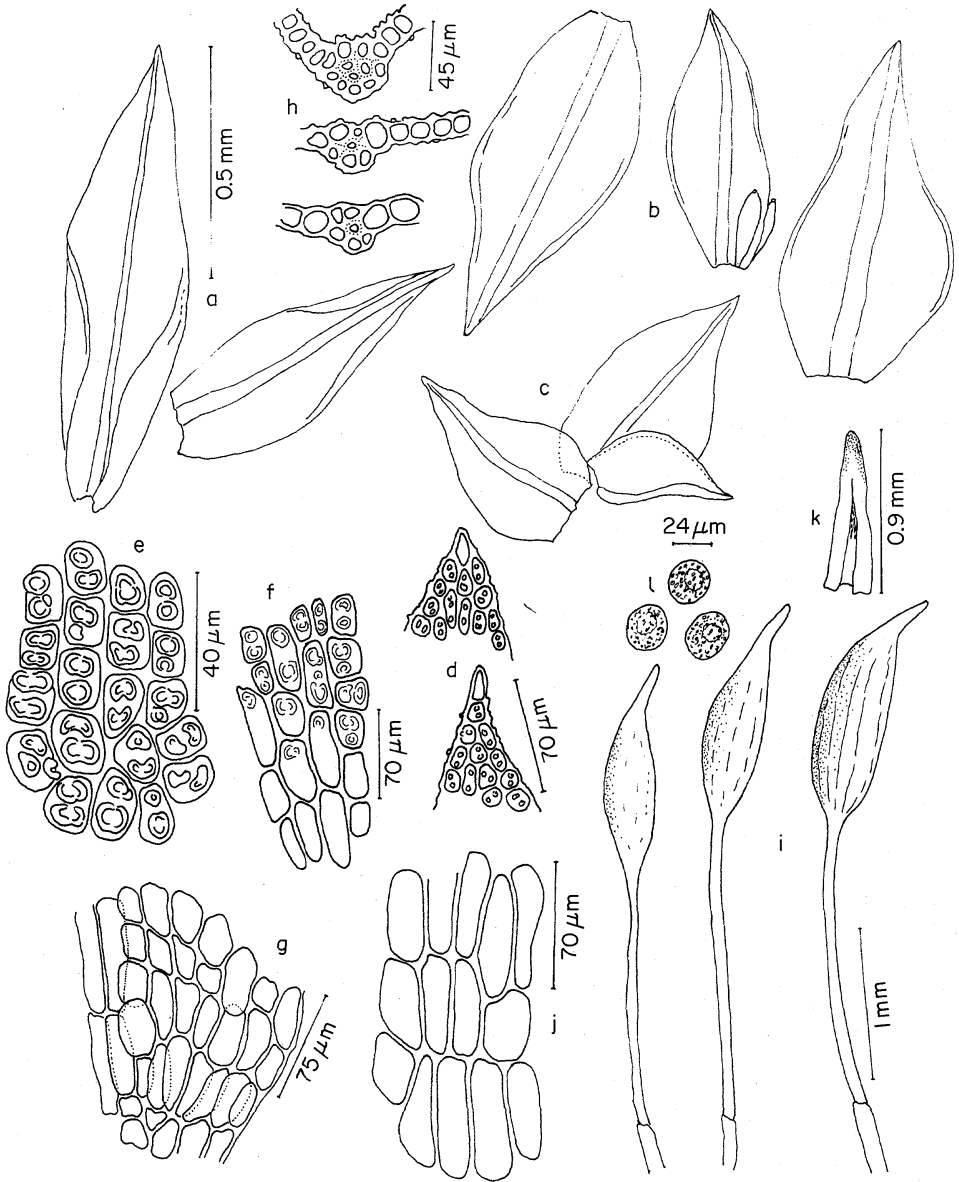


Fig. 1. *Phascum longipes*. a, perichaetial leaves; b, leaves from the middle of stem, c, lower leaves; d, leaf apex; e, cells towards upper part of leaf; f, cells towards mid-leaf; g, cells towards lower part of leaf; h, transverse sections of leaf; i, capsules; j, exothecial cells; k, calyptra; l, spores. All from the holotype.

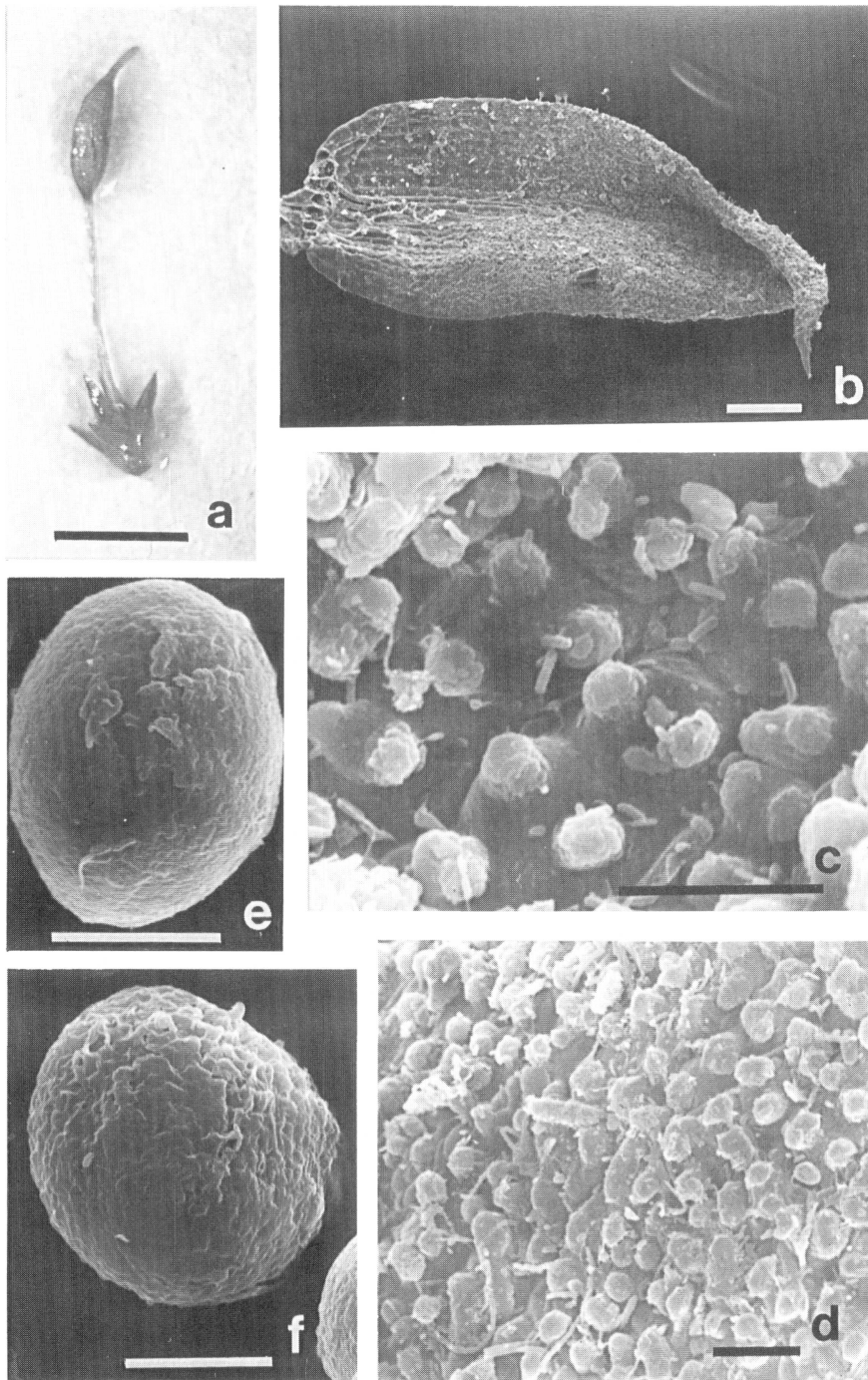


Fig. 2. *Phascum longipedis*. a, habit (scale 1 mm); b, perichaetial leaf; c, cells towards upper part of leaf; d, cells towards mid-leaf; e, f, spores (scales 10 μ m). All from the holotype.

Other specimens studied: ALMERÍA: Sorbas, Barranco del Huelí, near to Cortijo de la Fuente, WG7903, 475 m, 19 March 1988, Martínez & Ros (*Bryotheca UBM 3060*). Lucainena de las Torres, Cerro de las Cuevas, WF8408, 300 m, 7 April 1988, Martínez & Ros (*Bryotheca MUB 3070*). Sorbas, Lomilla de las Colmenas, Barranco Hondo, WF8697, 200 m, 7 April 1988, Martínez & Ros (*Bryotheca MUB 3071*) (Fig. 3).

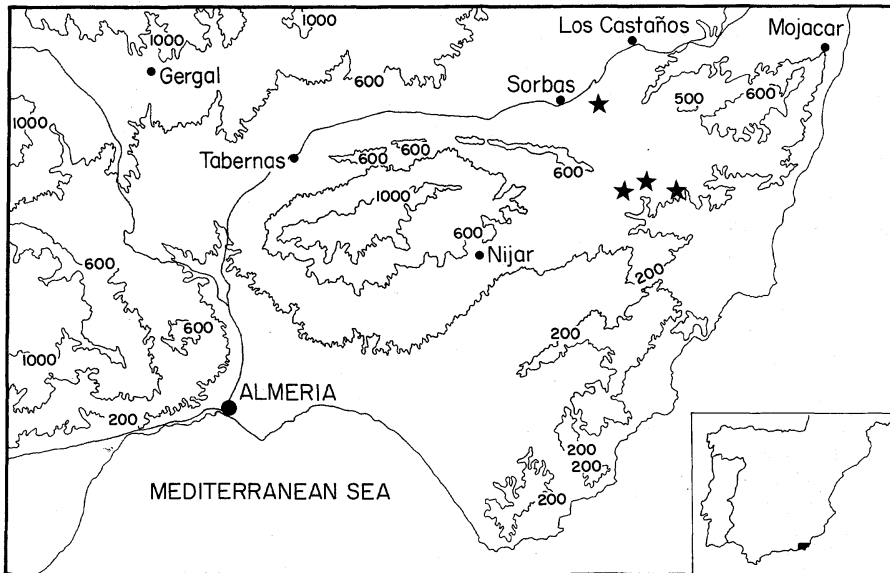


Fig. 3. Distribution of *Phascum longipes*.

ECOLOGY AND CLIMATE

We have only seen *Phascum longipes* on gypsum or loamy-gypsum soils colonized by *Stipa tenacissima* and other shrubs such as *Rosmarinus eriocalix*, *Salsola webbii* and *Helianthemum squamatum*. Other frequent mosses include *Phascum curvicolle*, *Pottia starkeana*, *Barbula unguiculata*, *Grimmia pitardii* and *Tortula revolvens* var. *obtusata*.

The area where this species has been found is one of the more arid of the Mediterranean region. Annual rainfall ranges from 250 to 350 mm. Maximum temperatures range from 27 to 35°C and minimum temperatures from 4 to 11°C. The maximum shade temperatures are higher than 40°C. From a phytogeographical point of view, this area belongs to the Murciano-Almeriense chorological province (Rivas-Martínez *et al.*, 1977).

RELATIONSHIP WITH OTHER SPECIES AND SYSTEMATIC POSITION

Phascum longipes is closely related to *Pottia fosbergii* described by Bartram (1930) from California. Both species are similar in size and habitat, and particularly in the morphological features of the sporophyte. However, there are some important differences as shown in Table 1.

Table 1. Comparison of *Phascum longipes* (Spanish material) with *Pottia fosbergii* (from type, Fosberg D24 in FH)

<i>Pottia fosbergii</i>	<i>Phascum longipes</i>
(1) Leaves always recurved from the base to the apex	Leaves irregularly recurved towards the lower middle part
(2) Leaves broadly ovate, scarcely acuminate	Leaves ovate-lanceolate, acute-acuminate
(3) Each cell with (2-)3-4(-5) papillae	Each cell with (1-)2-3 papillae
(4) Rostrum of capsule up to 120 μm when mature	Rostrum of capsule up to 240 μm when mature
(5) Nerve of the perichaetial leaves hardly excurrent	Nerve of the perichaetial leaves distinctly excurrent or percurrent

In Grout (1939) it is said that the taxonomic position of *Pottia fosbergii* in the genus *Pottia* is debatable. The absence of lid, no traces of peristome in a clearly cleistocarpous capsule and central strand in the stem are characteristic of the genus *Phascum* (cf. Nyholm, 1960). According to Zander (*in litt.*), *Phascum longipes* is an undescribed species and it could be included in the genus *Microbryum* Schimp. (Zander, 1989), an old section or subgenus of *Phascum* (cf. Limpricht, 1890; Roth, 1911).

According to other authors, such as Bartram (1930), the elliptic longly exserted capsules are some of the more important features characteristic of the genus *Pottia*. Consequently they include such cleistocarpous species in *Pottia*. However, in our opinion the presence of cleistocarpous capsules is sufficient to consider *Pottia fosbergii* and *Phascum longipes* as belonging to the genus *Phascum*. We propose a new combination:

***Phascum fosbergii* (Bartr.) Guerra comb. nov.** (Basionym: *Pottia fosbergii* Bartr., *Bryologist* 33, 18. 1930).

The same problem is found with *Pottia bryoides* (Dicks.) Mitt. and *Pottia recta* (With.) Mitt., which are also cleistocarpous. Nevertheless, they have some traces of peristome or other similar structure. Consequently some authors consider them to belong to *Pottia* (e.g. Brotherus, 1924-25; Smith, 1978) and others as *Phascum* (Bruch *et al.*, 1836-1856; Husnot, 1884-1890; Müller, 1849-1851). This is an important and very interesting question we are working on.

SUMMARY

A new species, *Phascum longipes* Guerra, Martínez & Ros, from gypsum soils of the south-east of the Iberian Peninsula is described. Its relationship with and differences from *Pottia fosbergii* Bartr. are discussed. Some ecological details are given. A new combination, *Phascum fosbergii* (Bartr.) Guerra is made.

ACKNOWLEDGMENTS

This work is a part of the results of the Project PB86-0481 supported by the DGICYT of Spain.

REFERENCES

- Bartram, E.B. (1930).** *Pottia fosbergii* sp. nov. *Bryologist* 33, 18.
- Brotherus, V.F. (1924–1925).** Musci. In: Engler, A. & Prantl, K. (eds), *Die natürlichen Pflanzenfamilien*. ed. 2, band 10–11.
- Bruch, P., Schimper, P. & Gumbel, T. (1836–1856).** *Bryologia Europaea*. Stuttgart.
- Grout, A.J. (1939).** *Moss Flora of North America. North of Mexico*. Newfane.
- Hosnot, T. (1884–1890).** *Muscologia Gallica*. Paris.
- Limpricht, K. (1890).** Die Laubmoose. *Rabenhorst's Kryptogamen-Flora*. Leipzig.
- Müller, C. (1849–1851).** *Synopsis Muscorum Frondosorum omnium Hucusque Cognitorum*, vol. I. Berlin.
- Nyholm, E. (1960).** *The Moss Flora of Fennoscandia*. vol. II. Musci. Lund.
- Rivas-Martínez S. et al. (1977).** Apuntes sobre las provincias corológicas de la Península Ibérica e Islas Canarias. *Opus. Bot. Pharm. Complutensis* 1, 1–48.
- Roth, G. (1911).** *Die aussereuropäischen Laubmoose*. vol. II. Dresden.
- Smith, A.J.E. (1978).** *The Moss Flora of Britain and Ireland*. London.
- Zander, R.H. (1989).** Seven new genera in Pottiaceae (Musci) and a lectotype for *Syntrichia*. *Phytologia* 65, 424–436.
- J. GUERRA, R. M. ROS & J. S. CARRIÓN, Departamento de Biología Vegetal (Botánica), Campus de Espinardo, 30071 Murcia, España.
- J. J. MARTÍNEZ, Departamento de Ciencia y Tecnología Agroforestal, EUP Albacete, Universidad de Castilla, La Mancha, España.