

Pterygoneurum compactum sp. nov. (Musci: Pottiaceae) from Spain

MARIA J. CANO, JUAN GUERRA, AND ROSA M. ROS

Departamento de Biología Vegetal (Botánica), Facultad de Biología, Universidad de Murcia, Campus de Espinardo, 30071 Murcia, Spain

Abstract. *Pterygoneurum compactum* sp. nov. is described and illustrated from Spain (Iberian Peninsula), where it grows on saline and gypsiferous soils. The new species is similar in habit to *P. crossidioides* Frey et al. but differs as discussed.

The genus *Pterygoneurum* Jur., which is distributed in the regions of the five continents with arid and semiarid climate, presents taxonomic difficulties, some of which we attempt to resolve here by a careful study of described taxa. This will allow for a more precise determination of the true identity of certain species. Wijk et al. (1967–1969) list nine species but in our opinion this number is rather high and reductions to synonymy seem possible. According to Touw (1974) 73–75% of published specific and infraspecific names have been reduced to synonyms in moss revisions between 1901 and 1974.

Pterygoneurum subsessile (Brid.) Jur., with a nearly worldwide distribution (cf. Duell 1984), is morphologically similar to *P. californicum* Crum (cf. Crum 1967), known only from the type locality. *Pterygoneurum arcticum* Steere has been synonymized with *P. lamellatum* (Lindb.) Jur. (cf. Corley et al. 1981). *Pterygoneurum ovatum* (Hedw.) Dix. is a polymorphic taxon which is only slightly different from *P. medium* (Salm.) Broth. and *P. sampanianum* (Mach.) Mach. *Pterygoneurum macleianum* Warnst. of South Africa and *P. kemsleyi* Willis of Australia are two little-known taxa with involute leaves, the differences between which are not very clear (cf. Magill 1981; Willis 1954). *Pterygoneurum smardeanum* Vanek is a controversial cleistocarpous species, perhaps of hybrid origin, and is a synonym of *P. koslovii* Laz. (Abramova et al. 1973). The most recently described species, *P. crossidioides* Frey et al. (Frey et al. 1990) is related to *P. compactum* sp. nov., described below, but they show clear-cut differences allowing ready separation.

PTERYGONEURUM COMPACTUM Cano, Guerra & Ros
sp. nov. (FIG. 1, 2–9, 10–15)

TYPE: SPAIN. ALICANTE. Elche, El Hondo lagoon, near Canal de Riegos, UTM: XH9927, Ros & Cano, 24.III.1993 (holotype: MUB 4649).

Caulidia cylindro centrali carentia, dichotome ramosa. Folia ovato-oblonga, margine saepe revoluta, nervo in pilum hyalinum excurrenti atque lamellis adaxialibus illius

(scilicet, nervi) filamentis chlorophylliferis ramosis, cellula terminali eorum subsphaerica et pluripapillosa, praeditis.

Plant small, in gregarious turfs; stem erect, to 2 mm high, often apparently dichotomously branched, without central strand; leaves erect-patent when moist, more or less imbricate when dry, concave, ovate to oblong-ovate, 0.6–0.8 mm long, 0.4–0.6 mm wide, apex rounded to obtuse, margins entire, plane to narrowly recurved at midleaf, papillose-crenulate with small papillae; costa 50–70 μ m wide at leaf base, excurrent in a strong hyaline hair-point, 0.3–0.6 mm long, sometimes with a short mucro, bearing two well-developed lamellae on adaxial side of upper half, with branched photosynthetic filaments arising from both sides of lamellae; filaments

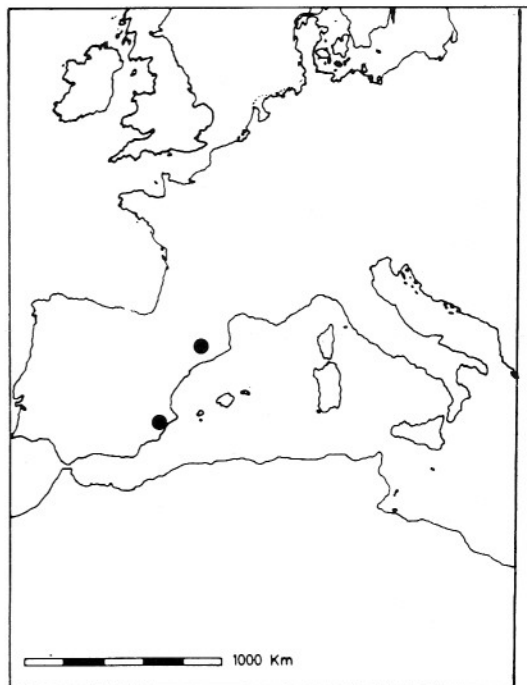
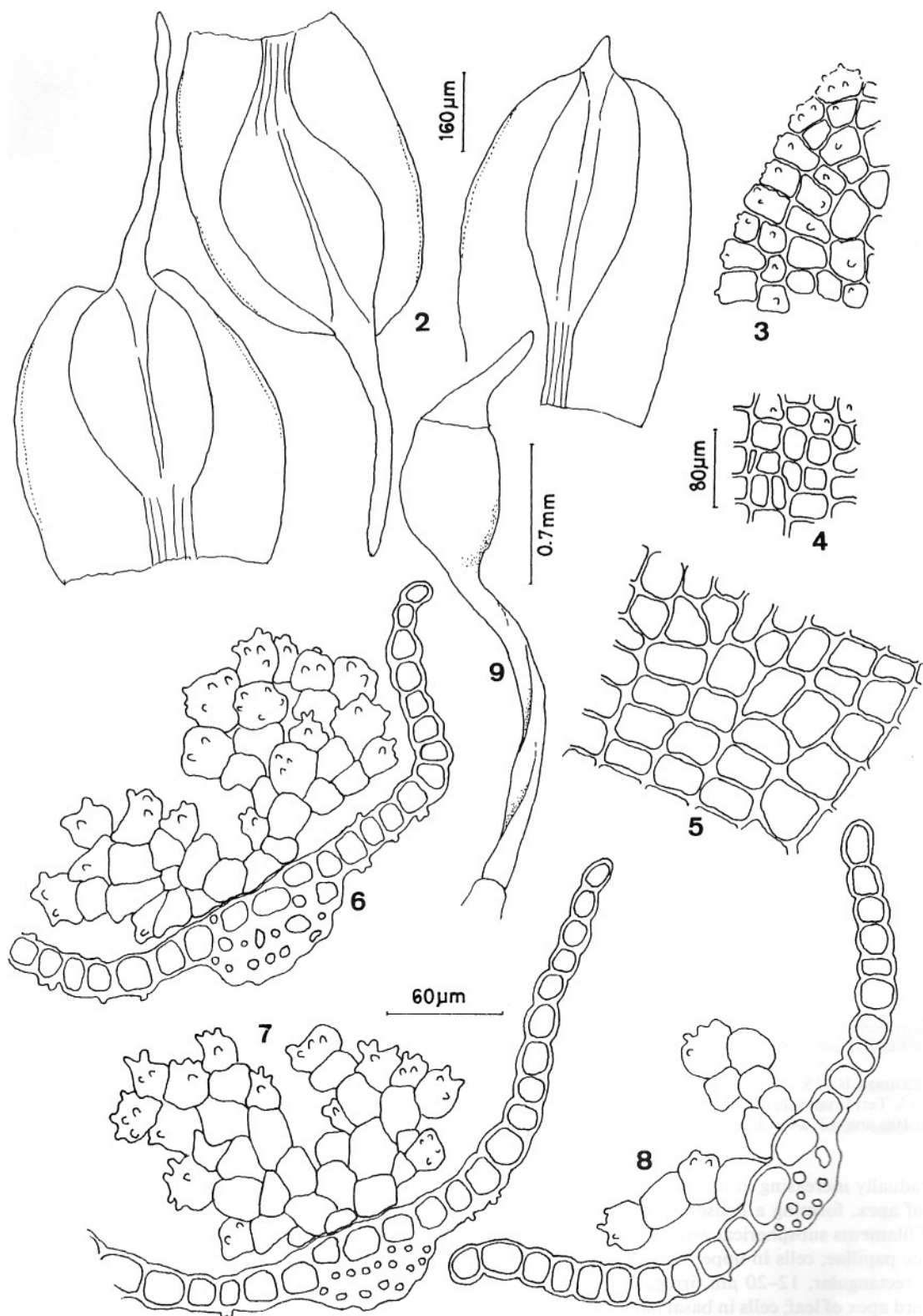
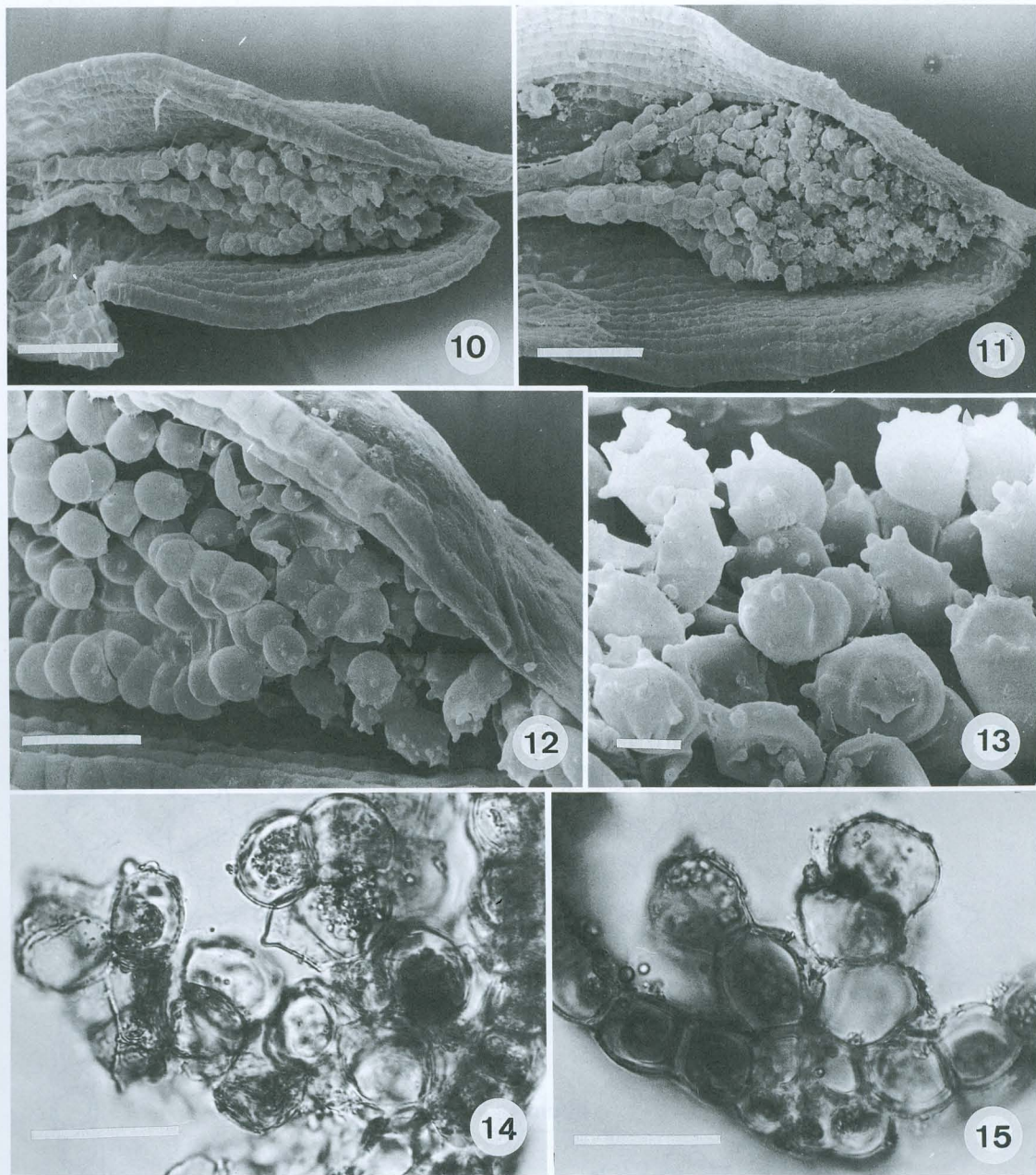


FIGURE 1. Distribution of *Pterygoneurum compactum*.



FIGURES 2-9. *Pterygoneurum compactum*. — 2. Leaves. — 3. Marginal cells of the leaf apex. — 4. Midlaminal cells. — 5. Basal areolation of leaf. — 6-8. Cross sections of leaves. — 9. Sporophyte. (2-8 from MUB 4649, holotype), (9 from BCB 30390).



FIGURES 10–15. *Pterygoneurum compactum*. — 10–12. Adaxial surface of leaves to show lamellae with filaments. — 13. Terminal cells of filaments. — 14–15. Portions of cross sections of leaves. (from MUB 4649, holotype). Bars: 10, 11: 100 μm ; 12, 14, 13: 50 μm ; 13: 10 μm .

gradually increasing in degree of branching toward leaf apex, forming a dense cushion, terminal cells of filaments subspherical, with 4–8 simple or bifurcate papillae; cells in upper half of leaves quadrate to rectangular, 12–20 μm , irregularly papillose toward apex of leaf; cells in basal half of similar shape or slightly longer, 18–26 μm wide, 18–40 μm long. Autoicous, perichaetial leaves scarcely differentiated, margins plane; perigonal leaves ovate, shorter

and broader than stem leaves, margins plane. Sporophyte with twisted seta, 1.8–2 mm long; capsule erect, ovoid, 0.6–1 mm long, 0.45–0.5 mm wide; operculum rostrate; peristome lacking; calyptra cucullate; spores spherical, granulate, 20–26 μm diam.

Additional specimens examined. — SPAIN. LÉRIDA. Balaguer, *Brugués et al.*, 1.IV.92 (BCB 30390), *Cros et al.* (BCB 30744). ALICANTE. Hondón de los Frailes–Albatera road, XH8334, *Cano*, 30.I.1994 (MUB 5005).

TABLE 1. Comparison of *Pterygoneurum compactum* and *P. crossidioides*.

	<i>P. compactum</i>	<i>P. crossidioides</i>
Lamellae	Narrow below and not reaching the leaf base	Wide at the base and reaching the leaf base
Filaments	Apical cell papillose and generally spherical	Apical cell smooth and generally conic
Laminal cells	Papillose above	Smooth throughout leaf
Leaf margin	Slightly recurved at midleaf, papillose	Usually plane, smooth

The new species is currently known from only three localities. The type locality is on saline soils protected by *Suaeda vera* J. F. Gmelin and *Phragmites australis* (Cav.) Trin. ex Steudel. Due to the high salinity of this place, the major part of the vegetation is composed of communities of halophytic plants belonging mainly to the vegetation class *Arthrocnemetea*. The average annual precipitation is approximately 276 mm and the average temperature 17.7°C, which corresponds to a semi-arid ombroclimate (Rivas-Martínez 1983). *Pterygoneurum compactum* in this area is associated with *Aloina aloides* (K. F. Schultz) Kindb., *Bryum bicolor* Dicks., *Pterygoneurum ovatum*, *P. subsessile* (Brid.) Jur., and *Tortula vahliana* (K. F. Schultz) Mont. In northeastern Spain it occurs on gypsiferous soil associated with *Tortula brevissima* Schiffn., *Crossidium crassinerve* (De Not.) Jur., *Phascum curvicolle* Hedw., and *Pterygoneurum ovatum*.

Pterygoneurum compactum is clearly related to *P. crossidioides*, a species only known from two sites near the Dead Sea, both possessing photosynthetic branched filaments on the two supracostal lamellae. This character has been found in *P. ovatum* (cf. Abramova et al. 1973) and *P. kemsleyi* (Catcheside 1980), but in neither of these does the degree of proliferation and branching result in the formation of a dense cushion as occurs in the first two taxa. The main differences between *P. crossidioides* and *P. compactum* are as follows. The apical cells of the filaments of *P. compactum* are clearly subspherical and papillose, whilst they are conical or very slightly subspherical and smooth in *P. crossidioides*. In *P.*

crossidioides the lamellae are of uniform height throughout the entire length of the nerve, whereas in *P. compactum* they occur only in the upper half of the leaf, are very low at their base, and increase in size progressively up to the midpoint. The lamina cells are smooth in *P. crossidioides* but papillose in *P. compactum*. The leaf margin is usually plane and smooth in *P. crossidioides* and frequently recurved and papillose in *P. compactum* (Table 1).

All these differences are more than sufficient to delimit this new taxon, which will very likely be found at more sites in the Mediterranean Basin and other regions of the world with an arid or semiarid climate.

ACKNOWLEDGMENTS

This research was realized with financial aid from DGI-CYT of Spain (Proyect PB90-0301-C02-01). We thank Dr. J. S. Carrión for his help with the SEM. The constructive suggestions of Dr. M. E. Newton and Dr. A. J. E. Smith are gratefully acknowledged.

LITERATURE CITED

- ABRAMOVA, A. L., L. S. BLAGODATSKICH & L. A. CZEREPANOVA. 1973. Conspectus generis *Pterygoneurum* Jur. (Musci) in URSS. Novitates systematicae plantarum non vascularium 10: 305-316.
- CATCHESIDE, D. G. 1980. Mosses of South Australia. South Australia.
- CORLEY, M. F. V., A. C. CRUNDWELL, R. DÜLL, M. O. HILL & A. J. E. SMITH. 1981. Mosses of Europe and the Azores; an annotated list of species, with synonyms from the recent literature. Journal of Bryology 11: 609-689.
- CRUM, H. 1967. A new species of *Pterigoneurum* from California. Madroño 19: 92-94.
- DUELL, R. 1984. Distribution of the European and Macaronesian mosses. I. Bryologische Beiträge 4: 1-113.
- FREY, W., I. HERRNSTADT & H. KÜRSCHNER. 1990. *Pterygoneurum crossidioides* (Pottiaceae, Musci), a new species to the desert flora of the Dead Sea area. Nova Hedwigia 50: 239-244.
- MAGILL, R. E. 1981. Flora of Southern Africa. Bryophyta, Part I, Mosses. Pretoria.
- RIVAS-MARTÍNEZ, S. 1983. Pisos bioclimáticos de España. Lazaroa 5: 33-43.
- TOUW, A. 1974. Notes on taxonomic and floristic research on exotic mosses. Journal of the Hattori Botanical Laboratory 38: 123-128.
- WIJK, R. VAN DER, W. D. MARGADANT & P. A. FLORSCHÜTZ. 1967-1969. Index Muscorum. Utrecht.
- WILLIS, J. H. 1954. Mosses new to western Australia. Victorian Naturalist 71: 8-12.