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# *Weissia papillosissima* Laz. (Pottiaceae, Musci), a species new to the European bryophyte flora

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SUMMARY

*Weissia papillosissima* Laz. is reported for the first time in Europe at different localities in the Iberian Peninsula. Previously it was known only from Tadhikistan in the former Soviet Union. The species is described and illustrated and its distribution mapped and discussed.

KEYWORDS: Europe, Musci, Pottiaceae, *Weissia*, *Hymenostomum*.

## INTRODUCTION

During a study of the bryophyte flora and vegetation of the Sierra del Maigmó (Alicante, S.E. Spain), several specimens belonging to the genus *Weissia* Hedw. were found, the characteristics of which (presence of epiphragm, leaves which are broad and little incurvate, stout nerve and very long and prominent papillae in the cells of the leaves) did not match any of the previously known *Weissia* spp. from Spain or Europe.

It was concluded, that the plants were *Weissia papillosissima* which was described by Lazarenko (1967) from the former Soviet republic of Tadhikistan. Although the type was not found in the herbarium of the State Museum of Natural History of the Academy of Sciences of the Ukrainian SSR, Lwów (KWS) or in the herbarium of the Department of Systematics and Plant Geography of the Komarov Botanical Institute of the Academy of Sciences of the former USSR, Leningrad (LE), where the herbarium of Lazarenko is deposited, a sample sent from LWS from Southern Tadhikistan was studied (Djilastan Mountains, altitude 1650 m, on limestone covered with soil, 1967, *U. K. Mamatkulov*).

According to the original description and after studying the sample mentioned above, it was concluded that the specimens found in Alicante corresponded to *W. papillosissima*.

The presence of an epiphragm corresponds to *Hymenostomum*, the taxonomical rank of which has been disputed and discussed on many occasions (Stoneburner, 1985; Zander, 1993). Many authors have defended *Hymenostomum* as an independent genus (Husnot, 1884–1890; Casares-Gil, 1932; Augier, 1966; Pierrot, 1982). An alternative taxonomical rank is that of subgenus *Hymenostomum* Kindb. within the genus *Weissia*. This taxonomical position has been supported by Mönkemeyer (1927) and Zander (1993). Müller (1849) on the other hand combined it as a section of the genus *Weissia*. *Hymenostomum* has even been considered a subgenus of *Gymnostomum* Nees & Hornsch. Nevertheless, papers published more recently which have treated this theme consider that the presence of an epiphragm is a character of little taxonomical value which is present in taxa of *Weissia* with or without peristomes (Stoneburner, 1985). An epiphragm can be found even in genera such as *Gymnostomum* (Greville & Arnott, 1824) and therefore it is not sufficient to distinguish two genera or even a subgenus within

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*Weissia* (Demaret & Castagne, 1959; Nyholm, 1975; Smith, 1978; Corley *et al.*, 1981; Anderson, Crum & Buck, 1990; Casas, 1991).

Five species of *Weissia* with an epiphragm are now known in Europe: *W. brachycarpa* (Nees & Hornch.) Jur., *W. condensa* (Voit) Lindb., *W. rostellata* (Brid.) Lindb. and *W. squarrosa* (Nees & Hornsch.) C. Müll. and *W. papillosissima* Laz.

### Key to European *Weissia* Species with an Epiphragm

| | | |
|---|---|---|
| 1 | Capsule not emerging above the perichaetial leaves, capsule not dehiscing in nature | *W. rostellata* |
| – | Capsule emerging over the perichaetial leaves, capsule dehiscing in nature | 2 |
| 2 | Leaves spreading to recurved when moist, with margin usually plane | *W. squarrosa* |
| – | Leaves erect to patent when moist, with margin usually incurved or involute | 3 |
| 3 | Nerve narrow, not reddish, 60 μm wide, leaves linear–lanceolate | *W. brachycarpa* |
| – | Nerve wide, reddish, 60–80(100) μm wide, leaves lanceolate or oval-lanceolate | 4 |
| 4 | Leaves very strongly involuted, short papillae present over the ventral surface of the leaves | *W. condensa* |
| – | Leaves little incurvate, long papillae present over the ventral surface of the leaves | *W. papillosissima* |

### Description of *W. papillosissima*

A complete description of the species is presented, since it is not included in any of the European floras.

**Weissia papillosissima** Laz. *Dopov. Akad. Nauk Ukrajins'k. RSR* 8: 752/ 1967 (Figs 1 & 2)

*Plants* 2–5 mm high, forming turfs. *Leaves* crisped when dry, patent when moist, lanceolate, not keeled; basal leaves 0.3–0.5 × 0.7–2.1 mm, clearly smaller than the middle and perichaetial leaves, which reach 2–2.4 × 0.45–6 mm; *apex* obtuse to rounded, shortly mucronate, not cucullate; *margin* involute in the upper and middle part of the leaf, plane in the basal one; *nerve* stout, reddish in the old leaves, 70–105 μm wide near base, costal transverse section with three guide cells in one layer and with two stereid bands, the dorsal one with 2–4 bands of cells and the ventral one with one band; *upper cells* of the leaf more or less quadrate, 7–12 μm wide, chlorophyllose, with 2–4 bifurcate spiculose papillae, 8–10 μm high; cells on the upper surface of the nerve similar to the former which become shorter and less densely papillose toward the middle part; cells in the basal third of the leaf rectangular and not papillose; *basal cells* completely hyaline and shortly rectangular, usually 11–20 μm long, but reaching 90 μm long and 9–14 μm wide, with thick walls; dorsal part of the leaves less densely papillose than the ventral and nerve almost smooth. Apparently paroecious. *Seta* yellowish, 3.3–3.7 mm long; *capsule* dull brown, exerted, erect, ellipsoid, 1.3–1.4 × 0.7 mm, striate when dry, annulus poorly differentiated, mouth of the capsule closed by an epiphragm; peristome lacking,

*lid* longly rostrate, with oblique beak 0.55–0.59 mm long; *calyptra* yellow, longly cucullate. *Spores* dull brown, isodiametric, with dense perinous pattern of granular elements, sometimes slightly anastomosed, 12–16 μm in diameter; the ornamentation is, therefore, not much different from that of many *Pottiaceae*. Habitat: calcareous soils on wooded slopes, shaded by herbs and shrubs. Also on earth accumulated over rocks.

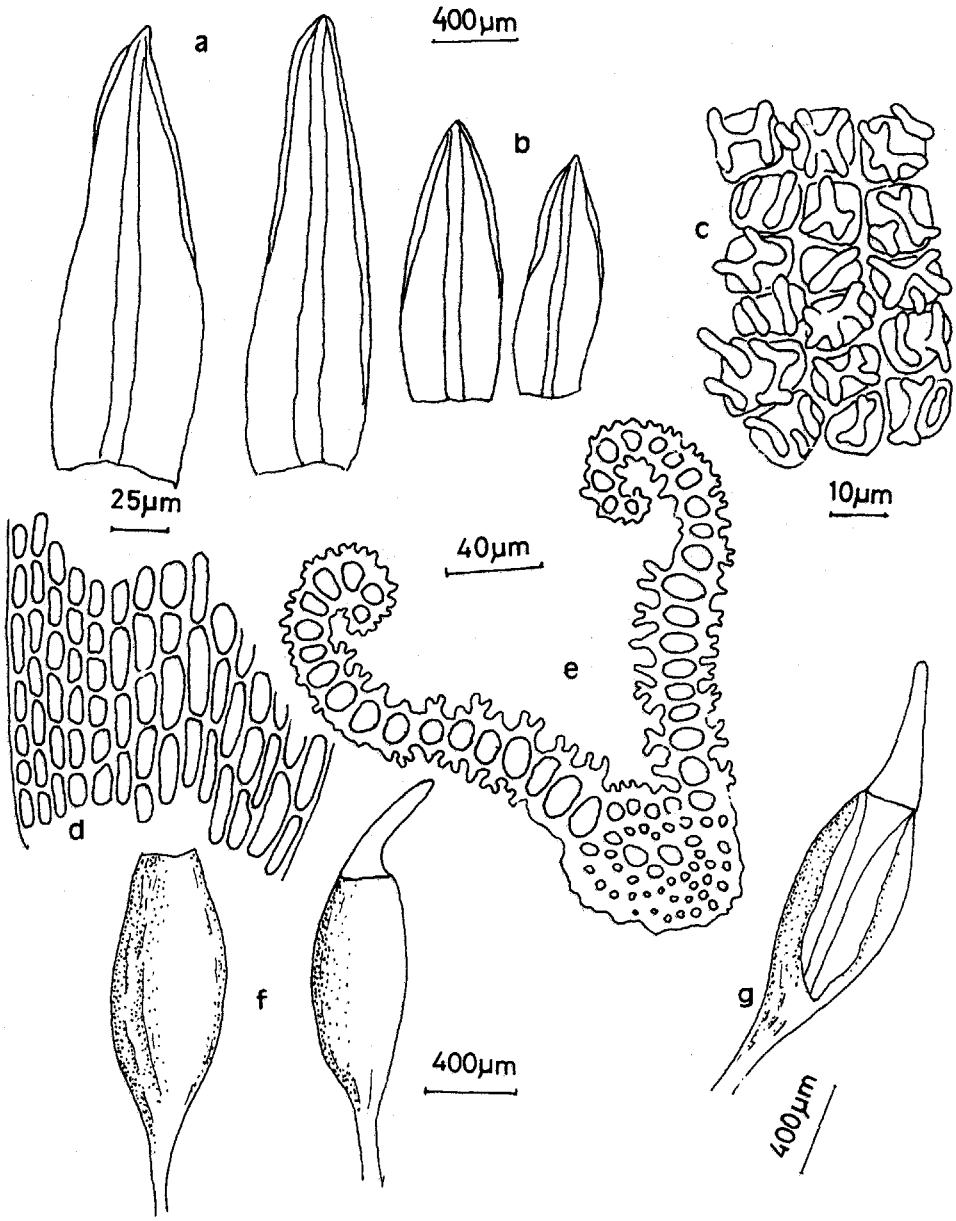


**Figure 1.** *Weissia papillosissima*. *a*, perichaetial leaves; *b*, basal leaves; *c*, upper cells of the leaf; *d*, basal cells of the leaf; *e*, leaf transverse section; *f*, capsules; *g*, longitudinal section of the capsule showing the epiphragm.

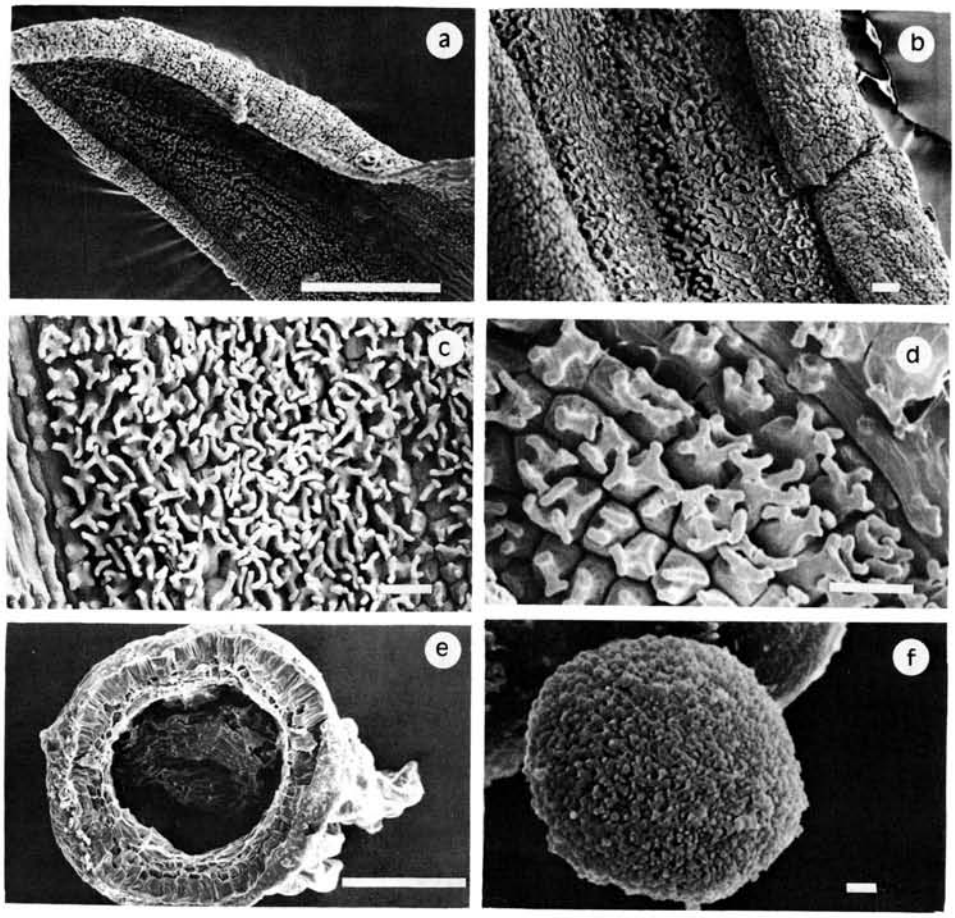


**Figure 2.** *Weissia papillosissima. a*, middle of leaf showing the ventral face; *b* and *d*, upper cells of the ventral face of the leaf; *c*, middle cells of the ventral face of the leaf; *e*, capsule showing the torn epiphragm; *f*, spore. Scales: *a*, *e*, 100 μm; *b*, *c*, *d*, 10 μm; *f*, 1 μm.

Other samples studied. **Spain.** Alicante: Sierra del Maigmó, Lomas de Pusa, solana (Petrer), 840 m altitude, YH 0363, *J. J. Moya & R. M. Ros*, 1989 (MUB 5334); Sierra del Maigmó, Alto del Maigmonet (Tibi), 1000 m altitude, YH 0764, *J. J. Moya & R. M. Ros*, 1989 (MUB 5335); Sierra de Aitana, Puerto de Tudons (Alcolecha), 1100 m altitude, YH 3381, *M.J. Cano, J. Guerra & R. M. Ros*, 1992 (MUB 5333). Logroño: not localized, *Zubía*, without date, (MA-Musci 3774); not localized, *Zubía*, without date, (MA-Musci 3732). **Portugal.** Algarve: Loulé, Covões, Ribeira de Moinhos concavidades de roca, 175 m altitude, NB 82, *C. Sérgio & M. Sim-Sim*, 1984 (BCB 12693).

## DISTRIBUTION

Although easily distinguished from other species it is little known and has probably been overlooked in the European Continent. It is apparently frequent in Tadhikistan, as there

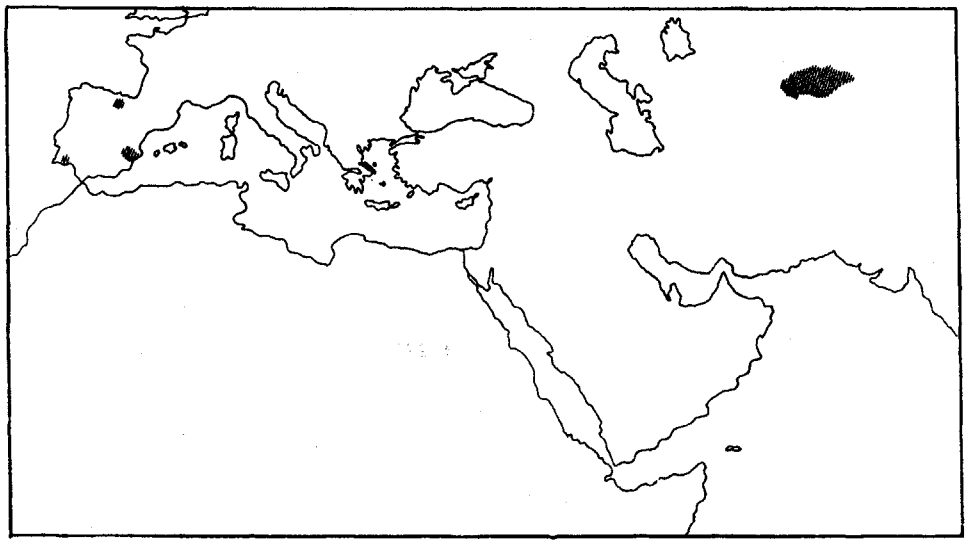

**Figure 3.** Map showing the known distribution of *Weissia papillosissima*.

are several old records and chromosome data have been published by Fritsch (1982, 1991). The chromosome number obtained from Tadhikistan material is n = 13 (Lazarenko *et al.*, 1970; Lazarenko, Vysotskaya & Lesnyak, 1971; Mamatkulov, 1967, 1971, 1989). In the protologue Lazarenko (1967) states '*in locis numerosis legit*'. Ignatow & Afonina (1992) record the species for Middle Asia.

On the basis of the current data the distribution of *W. papillosissima* (Fig. 3) appears similar to that of other species of mosses, such as *Tortula brevissima* Schiffn. and *Entosthodon hungaricus* (Boros) Loeske, which live on dry soils in parts of Europe, the Middle East and east of the former USSR (*cf.* Düll, 1984, 1985, 1992). Several lichens also exhibit this type of distribution including *Peltula radicata* Nyl., which is present in North Africa, the Middle East and Central Asia (Egea, 1989), and *Rinodina guzzini* Jatta, known from the Middle East, Mediterranean and Sub-Mediterranean steppe regions of East Europe and North Africa (Mayrhofer, 1984). These can all be considered mesogean elements (species present all around the Mesogean region) which are very common on saline, gypsiferous or chalky soils under arid or semi-arid climatic conditions.

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