

Didymodon revolutus (Bryopsida, Pottiaceae), A Species New to the Asian Flora

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Abstract. *Didymodon revolutus* (Cardot) R. S. Williams, currently known from America, is reported for the first time from Asia (Yemen). The species is lectotypified, described, and illustrated. A map showing the pantropical distribution of this species with stations in southwestern and central U.S.A. is provided.

During a taxonomic revision of the genus *Didymodon* in the Mediterranean Region, Macaronesia, and southwestern Asia, we have identified a specimen that did not seem to be any previously known *Didymodon* in this area. After studying the syntypes deposited in PC we concluded that the specimen was *Didymodon revolutus* (Cardot) R. S. Williams. The specimen examined was collected from western Yemen on soil on bank, San'a': Wadi Dahr, 20 km NW of San'a', 2,200 m, *King 53f* (E). This taxon has been until now considered as a species confined to the American continent. In North America, it has been cited from southwestern and central U.S.A. from Arizona, California, Missouri, New Mexico, Oklahoma, and Texas (Redfearn 1983; Stark & Castetter 1982; Zander 1994) and Mexico (Zander 1994, 1998); in Central America from Guatemala (Allen 2002); in South America from Ecuador (Churchill et al. 2000). The world distribution of

the species is given in Figure 1. A description and micrographs of the Yemen specimen follows.

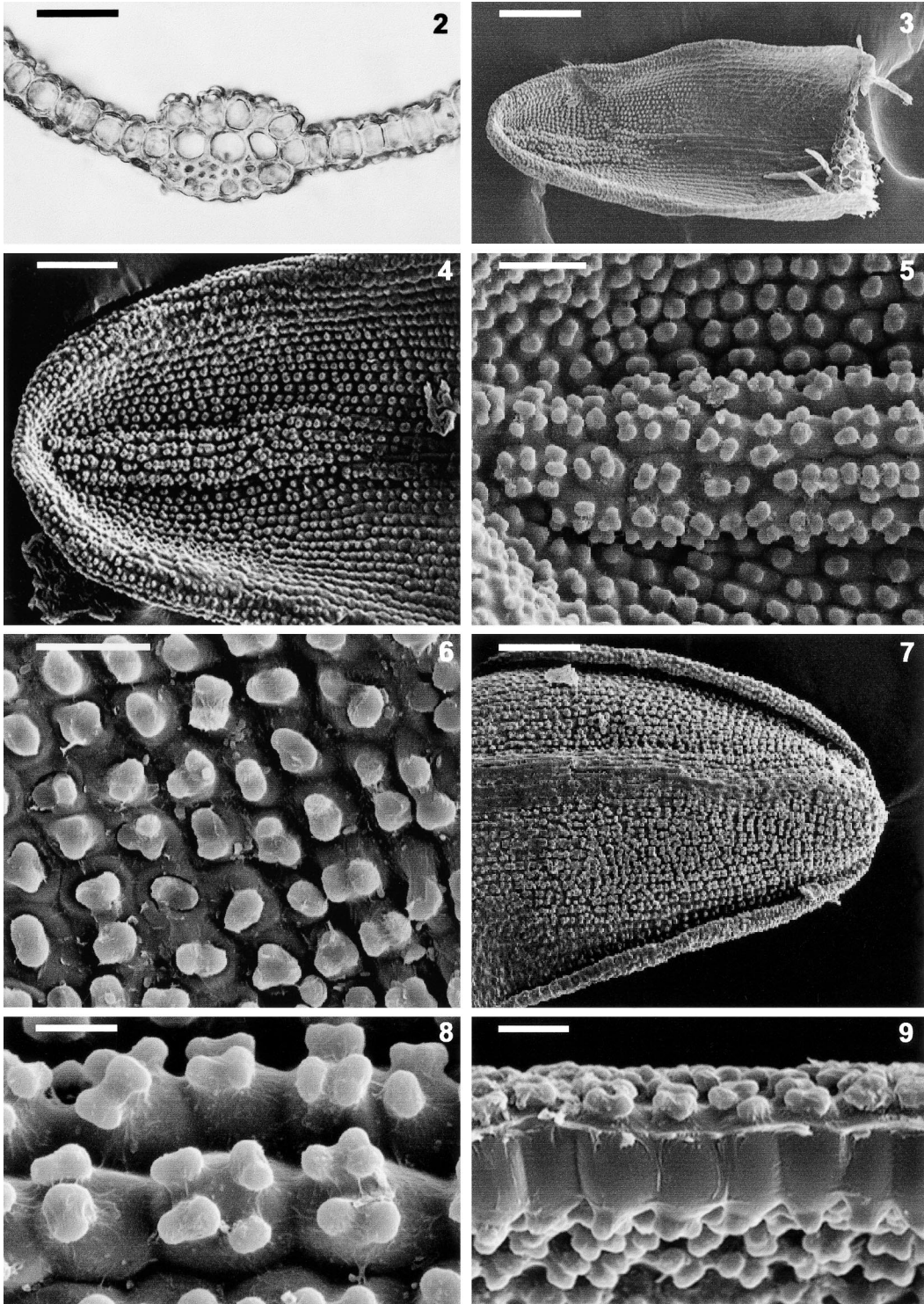
DIDYMODON REVOLUTUS (Cardot) R. S. Williams,
THE BRYOLOGIST 16: 25. 1922. Figs. 2–9

Husnotiella revoluta Cardot, *Rev. Bryol.* 36: 71. 1909.
Ind. loc.: "Etat de Mexico: Lecheria, murs, 1908 (n. 10523); Amecameca, 1908 (n. 10610). Etat de Morelos: près de Cuernavaca, murs, 1908 (n. 10531, 10636); Etat de Hidalgo; Tula, murs en terre, 1908 (n. 15214). Etat de Jalisco: Guadalajara, murs, 1908 (n. 10574 in parte, 15231 in parte, 15233)". TYPE: "Mexique: etat de Morelos, environs de Cuernavaca, murs" *Pringle 10531*, (PC!, lectotype [designated here]).

Plants to 2 mm high, growing in loose turfs, olive-green or brown. Stems erect, simple, hyalodermis absent, sclerodermis absent or scarcely differentiated, central strand differentiated. Axillary hairs of 3–7 cells, with 1–2 brown basal cells and



FIGURE 1. Present known distribution of *Didymodon revolutus*.



FIGURES 2-9. LM and SEM micrographs of *Didymodon revolutus*. — 2. Transverse section at midleaf (LM). — 3. Vegetative leaf (SEM). — 4. Leaf apex (SEM). — 5. Ventral surface of upper part of costa (SEM). — 6. Upper laminal cells (SEM). — 7. Dorsal surface of upper part of leaf (SEM). — 8. Detail of the ventral cells of the costa (SEM). — 9. Leaf transverse section (SEM). *King 53f* (E). Scales: 2 = 30 μm; 3 = 0.17 mm; 4, 7 = 100 μm; 5, 6 = 20 μm; 8, 9 = 10 μm.

hyaline upper cells. Leaves imbricate when dry, erect to patent when moist, concave, ovate to elliptic, lingulate, $0.5\text{--}0.9 \times 0.35\text{--}0.47$ mm; lamina unistratose, yellow with KOH; apex rounded, sometimes cucullate; margins entire, plane in the lower part, papillose-crenulate, recurved to revolute to near apex, unistratose or bistratose in patches. Costa $37.5\text{--}75.0$ μm wide at leaf base, ending below apex, very rarely percurrent, strongly spurred above midleaf, ventral cells of costa, in upper middle of leaf, quadrate, papillose, dorsal cells of costa, in upper middle of leaf, elongate, quadrate or shortly rectangular, papillose or smooth, in transverse section at leaf base elliptic, with 3–4 guide cells in one layer, without ventral stereids, 1(2) layers of dorsal stereids, ventral surface cells layer bulging, papillose, dorsal surface cells differentiated, papillose. Upper and middle laminal cells rounded to subquadrate, sometimes shortly rectangular, $5.0\text{--}12.5(15.0) \times 5.0\text{--}12.5$ μm , lightly thick-walled, with 1–4 simple or bifurcate papillae per cell; basal cells quadrate to rectangular, $(10.0)12.5\text{--}37.5(50.0) \times 10\text{--}15$ μm , generally lightly thick-walled, smooth. Dioicous. Sporophyte not seen.

Didymodon revolutus is characterized by ovate to elliptic or lingulate leaves, lamina yellow with KOH, apex rounded, costa ending below the apex, strongly spurred above midleaf, guide cells in one layer, without ventral stereids, 1(2) layers of dorsal stereids, and ventral epidermis with a pad of cells.

The specimens examined from Mexico have bistratose margins in patches and seldom capsules with a rudimentary or absent peristome. According to Zander (1994) some samples can have unicellular gemmae in leaf axils although, neither these nor bistratose margins in patches have been seen in the material from Yemen. This species may be confused with *D. aaronis* (Lorentz) J. Guerra, *D. australasiae* (Hook. & Grev.) R. H. Zander, and *D. haussknechtii* (Jur. & Milde) Broth., but they are

mainly distinguished from *D. revolutus* by having the guide cells in two layers (a single layer in *D. revolutus*), and hyaline basal cells.

Additional specimens examined.—MEXICO. HIDALGO. Tula, 2,075 m, *Pringle 15214* (PC). JALISCO. Guadalajara, 1,525 m, *Pringle 10574* (PC). Atemajac, Guadalajara, 1,375 m, *Pringle 15233* (PC). MEXICO. Lechería, 2,260 m, *Pringle 10523* (PC). Amecameca, 1,680 m, *Pringle 10610* (PC). MORELOS. Near Cuernavaca, 1,525 m, *Pringle 10636* (PC).

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