

Plagiothecium shevockii (Plagiotheciaceae), a New Species from Taiwan

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ABSTRACT. *Plagiothecium shevockii* S. He (Plagiotheciaceae) is described and illustrated as a new moss species from Taiwan. It resembles *P. paleaceum* (Mitten) A. Jaeger in having similar orbicular leaves, but differs by its much stronger double costae, and its slenderly acute and denticulate leaf apices that have a group of differentiated, hyaline, thin-walled cells often bearing rhizoids.

Key words: China, IUCN Red List, Plagiotheciaceae, *Plagiothecium*, Taiwan.

Plagiothecium Bruch & Schimper has been considered the only genus in the family Plagiotheciaceae (Buck & Ireland, 1985; Buck & Goffinet, 2000; Crosby et al., 2000), but it is often associated with *Herzogiella* Brotherus, *Isopterygium* Mitten, and *Taxiphyllum* M. Fleischer of the Hypnaceae (Ireland, 1969; Iwatsuki, 1970). Pedersen and Hedenäs (2001, 2002), however, consider the Plagiotheciaceae to contain 11 genera—*Bardunovia* Ignatov & Ochya, *Catagonium* Müller (Halle) ex Brotherus, *Herzogiella* Brotherus, *Isopterygiopsis* Z. Iwatsuki, *Myurella* Bruch & Schimper, *Orthothecium* Schimper, *Plagiothecium*, *Platydictya* Berkeley, *Pseudotaxiphyllum* Z. Iwatsuki, *Rhizofabronia* (Brotherus) M. Fleischer, and *Struckia* Müller (Halle)—on a much broader sense. At present, the genus comprises some 50 accepted names in the world (Crosby et al., 2000); nearly half of them are well-understood, temperate species.

Plagiothecium is characterized by its complanate habit, leaves with well-developed, decurrent alar regions, and stems with an outer row of large, thin-walled cells in cross section (Buck & Ireland, 1985). It has a hypnoid peristome, but this is not especially useful in distinguishing species of *Plagiothecium* from its closely related genera. Furthermore, the capsule orientation and peristome development vary within the genus. Recognizing *Plagiothecium* depends on its gametophytic features, especially its strong leaf decurrencies, often asymmetric leaves, and double or forked costae. Characters separating *Plagiothecium* species are subtle, and the observer must rely primarily on differences in leaf foliation, shapes, symmetry, characteristics of decurrency, degree of marginal serration and leaf cell sizes. In *Plagiothecium*, vegetative propagation by cylindrical or fusi-

form brood bodies of two to seven cells, either on the dorsal surface of the leaf apices or in the leaf axils on stems and branches, occurs in many species, i.e., *P. cavifolium* (Bridel) Z. Iwatsuki, *P. curvifolium* Schliephacke ex Limpricht, *P. denticulatum* (Hedwig) Schimper, *P. laetum* Schimper, *P. latebricola* Schimper, *P. neckeroideum* Schimper, *P. nemorale* (Mitten) A. Jaeger, and *P. succulentum* (Wilson) Lindberg (Ireland, 1969; Iwatsuki, 1970; Lewinsky, 1974). Leaf apical rhizoids have been reported for some species, such as *P. drepanophyllum* Renauld & Cardot (Sharp et al., 1994), *P. neckeroideum* (Iwatsuki, 1970), *P. nemorale* (Hedenäs, 1992), and *P. platyphyllum* Mönkemeyer (Lewinsky, 1974). Although in *Plagiothecium* many species have broadly ovate leaves, plants having orbicular leaves are rare. Only one species, *P. paleaceum* (Mitten) A. Jaeger, has been described with orbicular leaves (Enroth et al., 1992). A peculiar *Plagiothecium*-like moss was recently collected from Taiwan by James Shevock. It is quite distinct in having orbicular leaves with strongly decurrent leaf bases, slenderly acute, dentate leaf apices, and a group of short, hyaline, thin-walled cells at the leaf apices that have rhizoids on their abaxial surface. No other moss with these features is known in the genus *Plagiothecium*; it is here described as a new species.

Plagiothecium shevockii S. He, sp. nov. TYPE: China. Taiwan: Miaoli Co., Shei-Pa Natl. Park, 24°23'30"N, 121°13'45"E, on metamorphic rock underhang, 3600 m, 26 Apr. 1999, J. Shevock 18109 (holotype, MO; isotypes, CAS, PE, TAIE, UC). Figure 1.

Plagiothecio paleaceo (Mitten) A. Jaeger foliis orbicularibus similis, sed costis valde duplicatis, apicibus foliorum graciliter acutis dentatisque, in apice area ex cellulis distinctis hyalinis parietibus tenuibus saepe rhizoidea ferentibus praeditis differt.

Plants medium-sized, to 30 mm long, 4–6 mm wide when wet, soft, yellowish green, glossy, in loose mats; main stems creeping, secondary stems prostrate or slightly ascending, mostly simple, sometimes shortly branched, with leaves strongly contorted when dry; in cross section the outermost layer of stem cells large,

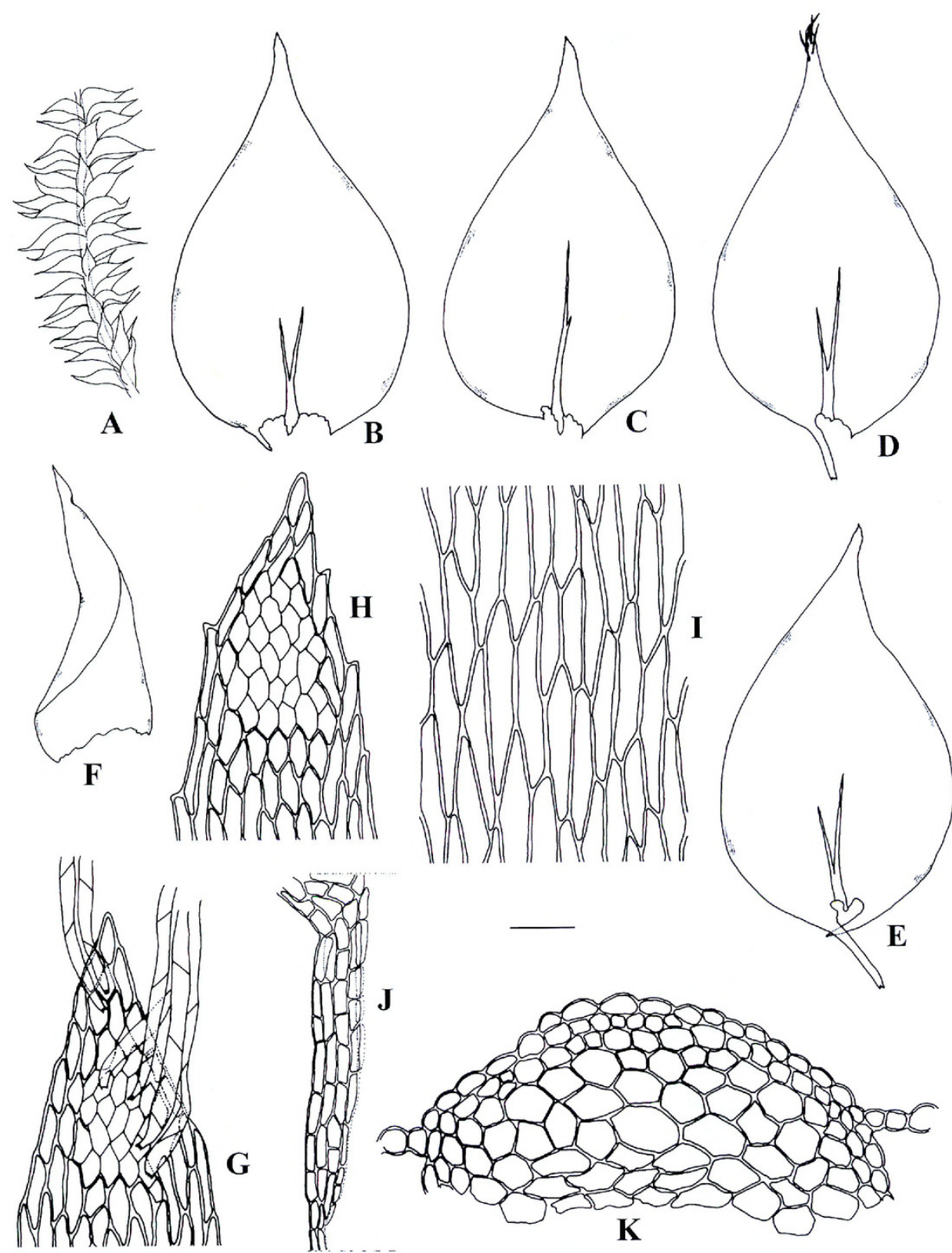


Figure 1. *Plagiothecium shevockii* S. He. —A. Portion of wet plant. —B–E. Leaves. —F. Perichaetial leaf. —G. Leaf apex with rhizoids on abaxial surface. —H. Apical leaf cells. —I. Median leaf cells. —J. Decurrent leaf cells. —K. Portion of stem cross section. All drawn from the holotype, *J. Shevock 18109* (MO). Scale bar = 3 mm (A); 0.55 mm (B–E); 0.20 mm (F); 45 μ m (G–I); 80 μ m (J); 35 μ m (K).

thin-walled, a central strand weakly differentiated; pseudoparaphyllia absent. Stem and branch leaves similar, soft, contorted when dry, distantly spaced, spreading, symmetric, orbicular, $2.8\text{--}3.1 \times 1.8\text{--}1.9$ mm, abruptly narrowed to a slenderly acute apex; margins plane, often dentate at the apex; costae strongly double or forked, ca. $1/3\text{--}1/2$ leaf length, occasionally appearing single; median leaf cells elongate-rhomboidal, thin-walled, smooth, $90\text{--}125 \times 15\text{--}18$ μm ; apical cells significantly shorter than adjacent cells, $20\text{--}30 \times 12\text{--}14$ μm , thin-walled, hyaline, often bearing rhizoids on the abaxial surface; basal juxtacostal cells shorter and broader than median cells; alar regions markedly differentiated, with somewhat enlarged, thin-walled, rectangular cells, strongly decurrent by long, narrow stripes along the stem in 2 to 4 rows and to 12 cells long. Dioicous? Perichaetial leaves shortly ovate-lanceolate. Sporophytes not seen.

Distribution and habitat. *Plagiothecium shevockii* was found at a single locality at a high elevation in *Juniperus* L. forest with *Rhododendron* L. understory along a rocky intermittent stream channel from the outlet of a shallow lake. It was growing on thin soil and litter at the base of a metamorphic rock underhang protected from direct sunlight.

IUCN Red List category. *Plagiothecium shevockii* is currently only known from the type locality. It appears to be rare and restricted to a high mountain area in Taiwan. Only a small patch of population has been discovered. Its IUCN conservation status at this point remains uncertain. The species should be classified as Data Deficient (DD) based on IUCN Red List criteria (IUCN, 2001).

Etymology. The specific epithet honors James Shevock, who has made significant contributions to East Asian bryology in recent years by collecting bryophytes, particularly in Taiwan, as well as mainland China and Korea.

Relationships. *Plagiothecium shevockii* is characterized by its orbicular, symmetric leaves that are suddenly narrowed to slenderly acute leaf apices; strong, double or forked costae (sometimes appearing to be single); and by its dentate leaf apices that have a group of differentiated, thin-walled, hyaline cells. It is similar to *P. paleaceum* from the Himalayas and southwestern China (Yunnan) in having rounded to orbicular leaves, but the latter differs by its much shorter double costae (ca. $1/5$ the leaf length); entire,

shortly pointed leaf apices that lack groups of differentiated, hyaline, thin-walled cells; and by its narrower median leaf cells ($11\text{--}14$ μm wide). The dentate leaf apices of *P. shevockii* that have a group of differentiated, hyaline, thin-walled cells bearing rhizoids are also seen in the European *P. platyphylum*. The latter differs from the new species by its irregularly branched stems and ovate-lanceolate, distinctly asymmetric leaves that are shortly pointed at the apex and narrowly recurved at the margins.

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