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# The status of *Tortula densa* (Velen.) J.-P. Frahm (Pottiaceae)

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&

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## ABSTRACT

HEINRICHS, J. & P. GEISSLER (†) (2001). The status of *Tortula densa* (Velen.) J.-P. Frahm (Pottiaceae). *Candollea* 56: 59-62. In English, French and English abstracts.

*Tortula densa* (Velen.) J.-P. Frahm is shown to be a synonym of *Tortula ruralis* (Hedw.) P. Gaertn. & al. s.str.

## RÉSUMÉ

HEINRICHS, J. & P. GEISSLER (†) (2001). Statut de *Tortula densa* (Velen.) J.-P. Frahm (Pottiaceae). *Candollea* 56: 59-62. En anglais, résumés anglais et français.

Les auteurs montrent que *Tortula densa* (Velen.) J.-P. Frahm n'est qu'un synonyme de *Tortula ruralis* (Hedw.) P. Gaertn. & al. s.str.

*KEY-WORDS:* POTTIACEAE – *Tortula ruralis* – *Tortula densa* – Systematics – Taxonomy.

Species of *Tortula* Hedw. sect. *Rurales* De Not. are known for their considerable variation regarding leaf shape, size and curvature and leaf cell pattern as well as development of a central strand. Identification of taxa focusses on features of the gametophytes, e.g. leaf shape and cell pattern, anatomy of the costa (KRAMER, 1980) and the stem (e.g. LIMPRICHT, 1890; TOUW & RUBERS, 1989; NYHOLM, 1989). Within the section, the *Tortula ruralis*-complex (*T. calci-colens* W. A. Kramer, *T. densa* (Velen.) J.-P. Frahm, *T. ruraliformis* (Besch.) Grout, *T. ruraliformis* var. *subpappiliosissima* (Bizot & R. B. Pierrot) W. A. Kramer, *T. ruralis* (Hedw.) P. Gaertn. & al., *T. ruralis* var. *substereidosa* W. A. Kramer, *T. ruralis* ssp. *hirsuta* (Venturi) W. A. Kramer, *T. ruralis* var. *submamilliosa* W. A. Kramer) is possibly the most difficult group as no clear distinguishing features are at hand and discrete features separating the taxa still couldn't be established.

In 1995, GEISSLER & FRAHM lectotypified *T. ruralis* choosing loosely and squarrosely leaved plants from the Hedwig herbarium representing the "Nominatform" of the species sensu KRAMER (1980). One year before, FRAHM (1994) raised *T. ruralis* var. *densa* Velen. to species level and designated a lectotype. According to FRAHM (1994), *T. densa* is distinguished from *T. ruralis* by densely spaced leaves erect-patent when wet and possesses leaves which are uniformly 4 mm long and ca. 1.3 mm broad. The plants are characterized as vigorous and are supposed to possess a hair-point at least basally reddish brown. According to the same author (FRAHM, 1995) *T. densa* possesses 3.5 mm long leaves and resembles *T. crinita* (De Not.) De



Fig. 1. – Plants from the lectotype of *Tortula densa* (Velen.) J.-P. Frahm. [*Velenovský s. n.*]

Not. or *T. virescens* (De Not.) De Not. in appearance and is therefore a rather small and delicate species.

However, an examination of the lectotype of *T. densa* revealed several differences from the descriptions cited above. The dioecious plants are rather loosely leaved and the leaves are obliquely spreading to squarrose when moistened for several minutes (Fig. 1). Leaf length varies from ca. 2.6 to 4.4 mm, the hyaline base of the leaves is ca. 1/3 of the leaf length (Fig. 2, a) and the upper laminal cells are opaque (Fig. 2, c) with diameters of ca. 11-16  $\mu\text{m}$ , in some leaves 13-20  $\mu\text{m}$ . The leaves are elongate ovate to lingulate, the margins recurved for ca. 4/5 the leaf length. Cross section of the costa in the upper half of the leaf (Fig. 2, b) reveals the presence of 4 guide cells and a dorsal stereid band 2-3 cells thick; hydroids are lacking. No central strand is present in the stem. Thus, the material corresponds well with the lectotype of *T. ruralis* and is not suitable for the typification of a distinct taxon:

*Tortula ruralis* (Hedw.) P. Gaertn. & al., Oekon. Fl. Wetterau 3(2): 91. 1802.

**Lectotype** (designated by GEISSLER & FRAHM, 1995): s. loc., specimen marked 1c in hb. Hedwig sub *Bryum rurale* (G !).

= *Tortula densa* (Velen.) J.-P. Frahm in Fragm. Florist. Geobot. 39: 393. 1994, **syn. nov.**

**Lectotype** (designated by FRAHM, 1994): Czech Republic, Revnice, XI 1893, *Velenovský s. n.* (PRC !).

Although *T. densa* is clearly a synonym of *T. ruralis*, densely leaved phenotypes exist of *T. ruralis* with leaves erect-patent when moist, resembling *T. calcicolens*. These phenotypes may be separated from *T. calcicolens* by their opaque upper lamina (*T. calcicolens* with translucent upper lamina). Furthermore, *T. calcicolens* often possesses a central strand (unpublished observations) whereas a central strand is lacking in the stem of *T. ruralis*.

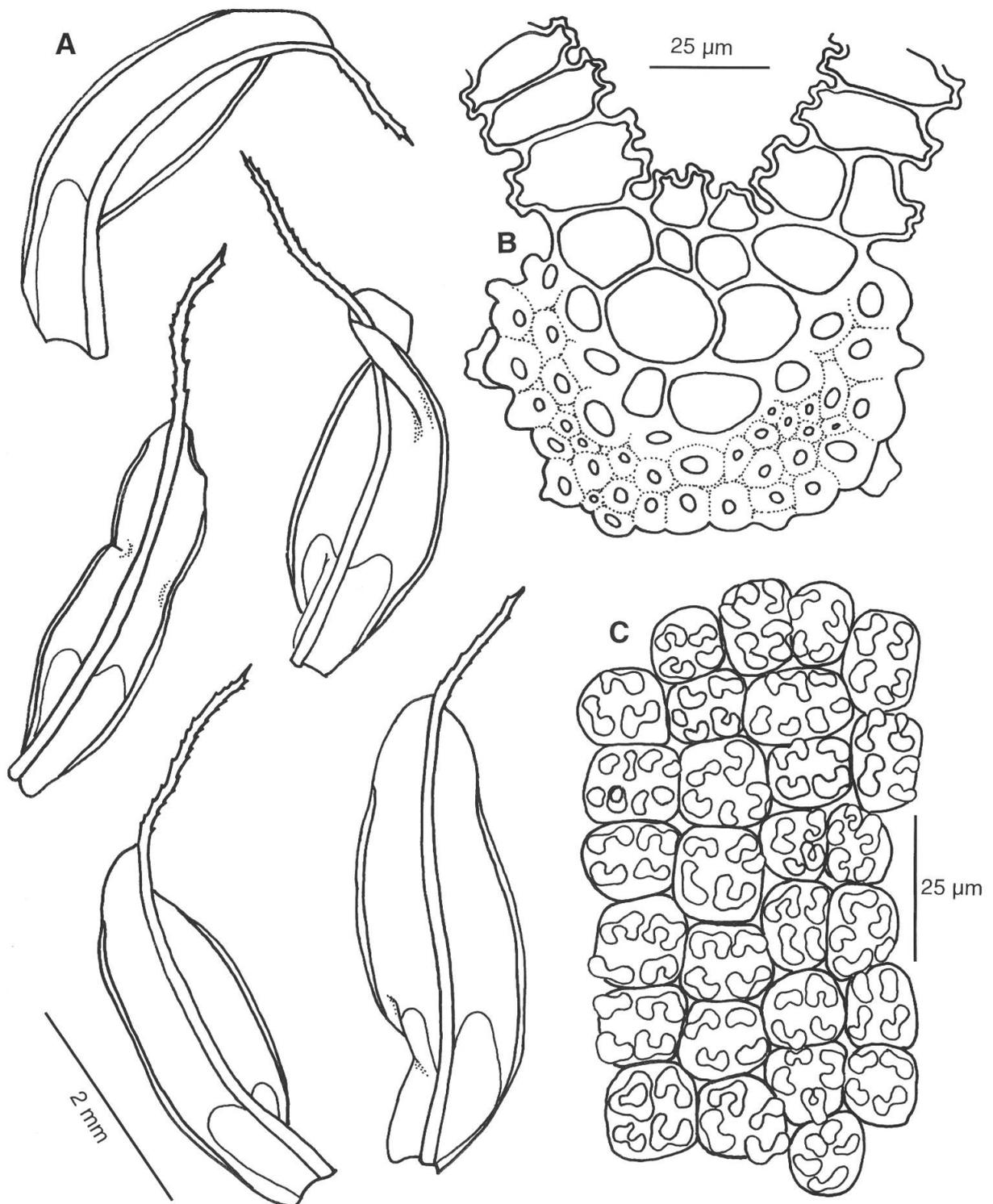


Fig. 2. – *Tortula densa* (Velen.) J.-P. Frahm. – **A.** Leaves. – **B.** Cross section of costa. – **C.** Leaf cell pattern. [From the lectotype, *Velenovský s. n.*]

Although the name *T. densa* is not acceptable the question remains whether plants with erect-patent, densely spaced leaves should be separated from *T. ruralis*. Our revision of more than 2000 specimens of *Tortula* sect. *Rurales* from Europe including extensive field studies confirmed a high variation within *T. ruralis*. However, extreme forms are linked by a large number of intermediates and parts of cushions on Eternit-roofs (compare ABTS & HEINRICHS, 1997) occasionally showed “densa” expression when growing under dryer conditions than the main part of the stand. Thus, the disposition of *T. ruralis* is largely influenced by growth conditions and a distinct taxon cannot be established only on the leaf curvature.

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