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Neckera xizangensis (Neckeraceae, Bryophyta), a new species from China

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Abstract: ***Neckera xizangensis*** Enroth & M.C. Ji ***sp. nov***. (Neckeraceae, Bryophyta) is described from Xizang (China) and illustrated in line drawings. It morphologically resembles *N. denigricans* Enroth from Vietnam and Yunnan, but differs especially by the much shorter costa, longer and narrower leaf cells, and the lack of an endostome.

Keywords: biodiversity, morphology, mosses, new species, taxonomy.

Introduction

The genus *Neckera* was estimated to have c. 50 species world-wide (Enroth 1994). That number is probably much too high since *Neckera* in its traditional and current circumscription is known to be polyphyletic (Olsson et al. 2009). However, since the specific and generic phylogenies are not yet adequately studied or the necessary taxonomic changes made, we follow the old generic concept here.

Redfearn et al. (1996) listed a total of 22 species of *Neckera* known from China. Since then, some new species have been described from the country and some names have been synonymised (Enroth 1996, Enroth & Ji 2007); at least two new species are awaiting description by the present authors. The author Ji is revising the genus *Neckera* in Asia and Australasia as his PhD-project, and the specimen reported here represents a Chinese species new to science.

Neckera xizangensis Enroth & M.C. Ji***, sp. nov.*** (Fig. 1)

Hic species ut videtur praecipue H. denigricantis similis, sed costa brevissima, cellulae foliorum longiores et angustiores, endostomium nullum.

Holotype: China, Xizang, SE Tibet, W above Gyala Peri-N Glacier (High Camp 15'), undisturbed *Abies* forest on N-facing boulder slope, 29°54'N, 94°52'E, 3850 m, 21. Aug. 1994, *G. Miehe & U. Wündisch 94-216-34* (H).

Plants gregarious, frondose, glossy, to c. 6 cm tall. Stolons creeping, bearing small leaves and tufts of brownish-orange, smooth, sparsely branched rhizoids. Stems in cross-section elliptic, with 2–3 layers of cortical cells with thick and reddish-brown walls, grading into 2–3 layered, larger inner cortical cells with thinner yet firm walls, medullary cells still larger, their walls thin; central strand none. Stipes indistinct, stipe leaves hardly differentiated. Fronds irregularly pinnately branched, smaller fronds often unbranched. Leaves strongly and regularly undulate, somewhat complanate, imbricate, patent to more widely spreading, asymmetrically ovate-lanceolate, slightly auriculate and shortly decurrent. Stem leaves to 3.0 mm long and 1 mm wide; apex acute; leaf margins plane, entire or faintly serrulate near base and at midleaf, more distinctly serrulate near apex; costa absent or very short. Branch leaves to 2.4 mm long and 0.8 mm wide, otherwise similar to stem leaves. Leaf cells smooth, mostly slightly vermicular, walls incrassate and porose; apical laminal cells linear, 30-50 µm long, 4–6 µm wide; median laminal cells linear, 50–80 µm long, 4–6 µm wide; basal laminal cells linear, 60-100 µm long, 4-6 µm wide; cells at leaf insertion shorter and wider, with thicker and yellowish walls; marginal cells relatively weakly differentiated, in 1(-2) row(s) shorter than adjacent laminal cells; alar cells indistinct, mostly irregular to rectangular or fusiform and shorter than adjacent laminal cells. Branch primordia covered by embryonic leaves: pseudoparaphyllia few, lanceolate,

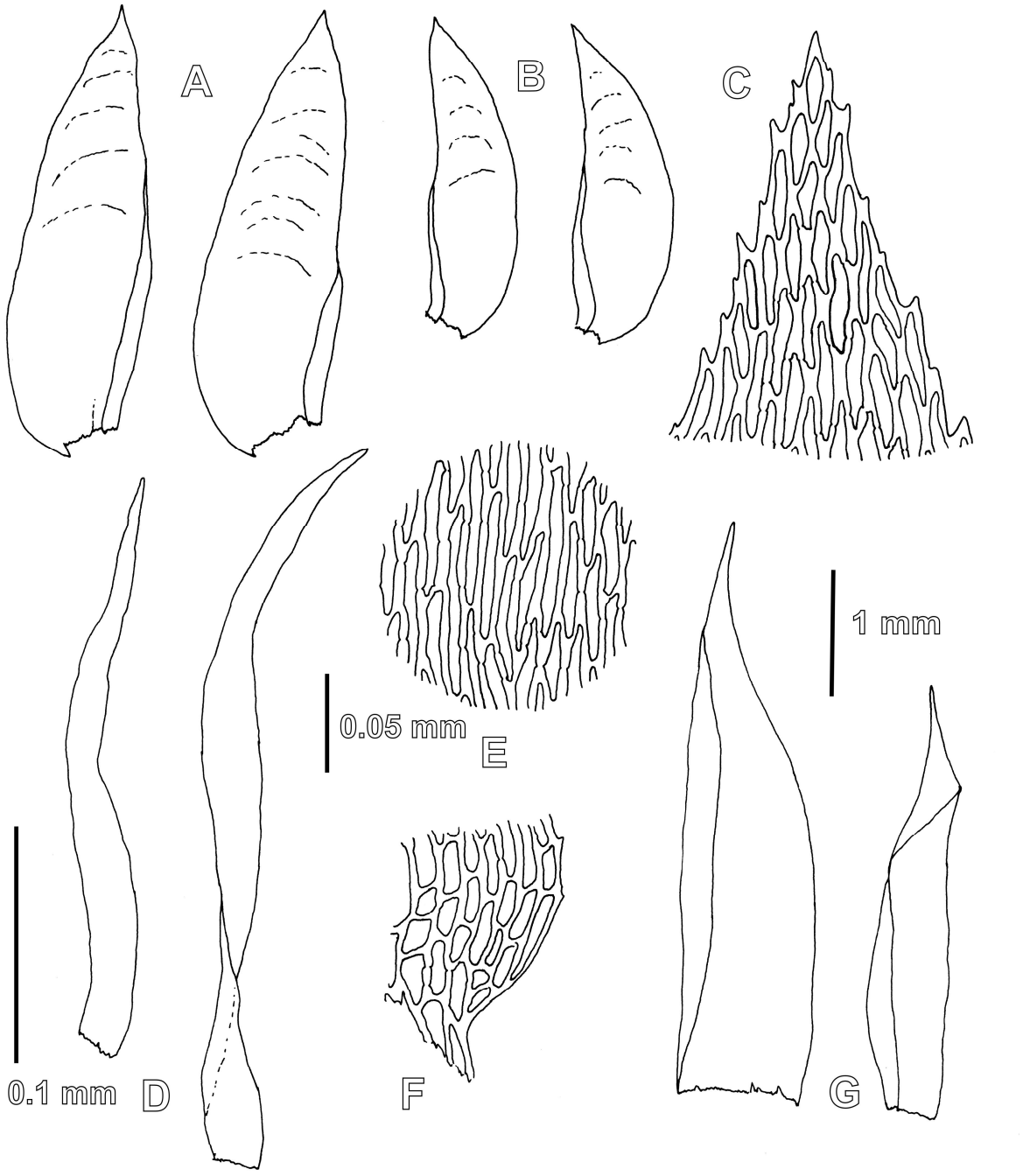


Figure 1. *Neckera xizangensis* (from the holotype). A, two stem leaves. B, two branch leaves. C, apex of stem leaf. D, outlines of two paraphyllia. E, median laminal cells. F, alar region. G, post-fertilization perichaetial leaves. The 1 mm scale is for A, B and G; the 0.1 mm scale for D; and the 0.05 mm scale for C, E and F.

to 400 (-500) µm long. Paraphyllia scattered, in small groups, filiform and uniseriate or subulate and leaf-like, to c. 300 µm long.

Autoicous. Perigonia c. 1.1 mm high, gemmiform, often in groups near perichaetia; perigonial leaves ovate with acute apices, ecostate; antheridia c. 0.5 mm long with stalks; paraphyses few, hyaline, filiform. Perichaetia on stems; post-fertilization perichaetial leaves tightly sheathing developing sporophytes, ecostate, to 4.0 mm long and 1.3 mm wide, elliptic, at ¾ leaf length narrowed into a lanceolate acumen, apex acute; leaf margins entire except some irregular dentation sometimes present at shoulder region. Seta 0.5 mm long, smooth. Capsule immersed, erect, obloid to somewhat ellipsoid, reddish brown, 1.9 mm long and 1.0 mm wide; apophysal stomata none; exothecial cells slightly collenchymatous, longitudinal

walls thicker than tranverse walls, irregular, from linear to rectangular and pentagonal to rounded, c. 20-60 µm long and 10-25 µm wide; suboral cells thicker-walled, transverse, reddish; annulus none. Exostome teeth 16, pale yellowish, 450 µm long, 65-70 µm wide at base, dorsally striolate near base, smooth or weakly and remotely papillose elsewhere, median line faint, ventral face smooth or similarly papillose as dorsal face. Endostome absent. Spores 30-35 µm diameter, faintly but densely papillose. Operculum conic and obliquely rostrate. Calyptra cucullate, smooth, 3-4 stratose near apex.

Although known only from one specimen, *N. xizangensis* is a distinct species. It resembles *N. denigricans* (Enroth 1996), known from Vietnam and Yunnan, in many respects, such as the general leaf shape, laminal cells with thick and porose walls, and presence of scattered paraphyllia. However, *N. xizangensis* can be distinguished by the very short costa, longer and narrower leaf cells, and the lack of an endostome. The latter character is also encountered in *N. bhutanensis* Nog. (cf. Noguchi 1971), but that species has much thinner and solid leaf cell walls, and it lacks paraphyllia altogether. According to our experience, cell wall thickness and porosity are fairly stable characters in *Neckera*, and they show only slight infraspecific variation. This also applies to *N. denigricans* and *N. bhutanensis*; we have studied several specimens of the former and dozens of the latter.

Neckera xizangensis was growing on a boulder in undisturbed *Abies* forest, at the altitude of 3850 m a.s.l. That vegetation zone between c. 3000 and 4300 m a.s.l. was termed "subalpine needle-leaf forest" by Fang et al. (1996). In addition to *Abies*, the dominant tree genera are *Picea* and *Larix* (Pinaceae), *Juniperus* (sect. *Sabina*, Cupressaceae) and *Betula* (Betulaceae). Fang et al. (1996) conclude that these forests are "similar to the circumpolar boreal forests both in floristic composition and physiognomy" (see Miehe 1984 for a more detailed treatment of this Himalayan vegetation type). *Neckera xizangensis* thus represents an oroboreal element in the Himalayan moss flora. It should be noted that in this same general region *N. bhutanensis* has been collected as high as at 4410 m (pers. obs.)

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