

中国藓类一新纪录种—嵌边拟平藓

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摘要: 报道了原产于东南亚的嵌边拟平藓 [*Neckeropsis moutieri* (Broth. & Par. in Par.) Fleisch.] 为中国新纪录种。本种与云南拟平藓 (*Neckeropsis takahashii* Higuchi et al.) 最为相似, 但因具丝状的假鳞毛和较弱的分化嵌边而有别。同时, 还提供了嵌边拟平藓详细的描述和形态图, 以及中国产拟平藓属 11 种的分种检索表。

关键词: 中国; 藓类; 新纪录种; 平藓科; 嵌边拟平藓

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Neckeropsis moutieri (Neckeraceae), a Southeast Asia Species New to China

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Abstract: The moss *Neckeropsis moutieri* (Broth. & Par. in Par.) Fleisch. (Neckeraceae) is reported herein new to the moss flora of China, representing the first record of the species newly discovered outside southeast Asia. It differs from the closely related species *Neckeropsis takahashii* Higuchi et al. in its filamentous pseudoparaphyllia and weaker intra-marginal borders. The species is illustrated and described based on the Chinese material. A key to the 11 species of *Neckeropsis* Reichardt in China is presented.

Key words: China; Moss; New record; Neckeraceae; *Neckeropsis moutieri*

On our field trip in 2006 to the Longgang National Nature Reserve, Guangxi Province, China, we discovered an interesting moss growing on rocks in karst forests. The plants are dark green and completely sterile with stiff, simple or rarely branched stems. The specimen gives an appearance of wiry texture often consisting of naked stems with only costae remained due to the very rigid leaves that are easily broken off. The leaves are distinctly shrivelled and twisted when dry, and they are strongly complanate and noticeably pseudotetrastichous when wet. The most peculiar

feature of this moss is exhibited in its leaves by the distinctly differentiated intra-marginal borders along both lateral margins from the base to near the apex. The borders, consisting of elongate, highly incrassate cells, are mostly separated from the margins by 1-2 rows of shorter cells, and they are 3-5 cells wide and 2(-3) cells thick. The complanate and pseudotetrastichous leaf arrangements coupled with the often asymmetrically lingulate to oblong-ovate leaves and the nearly percurrent, strong single costa present no doubt for a determination that this moss belongs to the

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genus *Neckeropsis* Reichardt. The unusual limbate leaves strongly suggest the affinities to *N. moutieri* (Broth. & Par. in Par.) Fleisch. from northern Vietnam and the Philippines^[1-3] and to *N. takahashii* Higuchi *et al.* from Yunnan Province in southwestern China^[4]. The precise structure of intra-marginal borders of this moss appears to be mostly close to *N. moutieri*, which has its borders not confluent with the tips of costae in the leaf apex. This finding represents the first record of *N. moutieri* in China and in a region beyond its current range in southern Asia.

1 Description and discussion

嵌边拟平藓 (新拟) Figs. 1-10.

Neckeropsis moutieri (Broth. & Par. in Par.) Fleisch., Musci Fl. Buitenzorg: 882. 1908. *Sciaromium moutieri* Broth. & Par. in Par., Rev. Bryol. 27: 78. 1900. *Neckera moutieri* (Broth. & Par.) Broth. in Engler & Prantl, Nat. Pflanzenfam. I(3): 842. 1906.

Plants deep green, dull, not glossy. Primary stems stiff, mostly naked, creeping; secondary stems rigid, wiry, straight, up to 4.5 cm long, 1.5-2.0 mm wide, usually simple, rarely branched, variously foliate, sometimes naked, consisting of only residuary costae. Pseudoparaphyllia filamentous. Leaves shrivelled and twisted when dry, distinctly complanate and pseudotrastichous when wet, more or less asymmetric, lingulate or ovate-lingulate, sometimes obovate-lingulate, 1.25-1.55 mm long, 0.5-0.6 mm wide, mostly rounded obtuse or broadly acute at apex, slightly narrowed toward base, not particularly decurrent; margins densely denticulate to dentate from leaf middle to apex, with intra-marginal borders strongly differentiated by elongate, incrassate cells along both lateral margins to near leaf apex, the borders 3-5 cells wide, 2(-3) cells thick, separated from the margins by 1-3 rows of shorter cells, not confluent with the tips of costae in the leaf apex; costae single, strong, nearly percurrent, ending in a few cells below the apex; apical leaf cells irregularly rhombic, 4-6 angular, sometimes shortly obovate-rectangular, 7-15 μm long, 5-7 μm wide; median and

lower cells not much differentiated from the upper cells, slightly larger and elongate; basal cells and basal juxtacostal cells more elongate, shortly rectangular or rhomboidal, up to 20-25 μm long; alar cells not differentiated. Sexuality and sporophytes unknown.

Neckeropsis moutieri is distinguished from *N. takahashii* primarily by the structure of intra-marginal borders^[4]. In *N. takahashii*, the borders are stronger, 4-6 cells wide, 4-6 cells thick, separated from the margins by 1-3 rows or even 5-10 rows of shorter cells at leaf base; and they are usually confluent with the tips of costae in the leaf apex. In contrast, the borders are weaker in *N. moutieri*. They are 3-4(-5) cells wide, 2(-3) cells thick, mostly separated from the margins by 1-2 rows of shorter cells; and they are not confluent with the tips of costae in the leaf apex. Additional character that can be used to separate the two species is the morphology of their pseudoparaphyllia. They are filamentous in *N. moutieri* as observed from the specimen of Guangxi, although the type of pseudoparaphyllia in this species was not mentioned elsewhere^[1-3]. The pseudoparaphyllia are narrowly foliose in *N. takahashii*^[4].

Geographically, Guangxi locality is closer to Vietnam (*N. moutieri*) than to Yunnan (*N. takahashii*). The specimen of *Neckeropsis moutieri* found in Guangxi Province appears to be associated with a seasonal wet habitat. During the monsoon season, the rock surfaces of creeks where this moss occurs are often inundated or influenced by availability of running water for several months. Therefore, the plants show a set of rheophytic morphological adaptations. The stiff plants with wiry texture and fragile leaves, which are easily broken off during the dry season, appear to be suitable for asexual reproduction. The rheophilous habit may also have resulted in the lack of sporophytes and sex organs and may require the development of strong single costa and the well differentiated intra-marginal borders for stronger physical support.

Ten species of *Neckeropsis* were previously recorded for the moss flora of China^[5-6]. With addition

of this new record of *N. moutieri*, eleven species are known to China at this time. In evaluating the characters to separate the ten species of *Neckeropsis*, we do not think sterile plants of *N. calcicola* and *N. lepineana* can be easily separated. Even sporophytic features, such as perichaetial leaves and seta length, are so vague to allow an easy separation of the two species. It is also worth noting that the structure of intra-marginal borders in distinguishing *N. moutieri* from *N. takahashii* is not always straightforward. We

found that morphology of pseudoparaphyllia offers a clearer distinction between the two species.

2 Specimen examined

Guangxi (广西): Longzhou Xian (龙州县), Longgang National Nature Reserve (弄岗国家级自然保护区), Longrong Section (陇荣片), 22°28'28"N, 106°57'27"E, alt. 189 m, in northern tropical evergreen seasonal rain forests, 21 September 2006, S. He (何思) 40411 (MO).

3 Key to the species of *Neckeropsis* in China

1. Leaves distinctly bordered intra-marginally by elongate, thick-walled cells along both lateral margins, with borders ca. 3–6 cells wide
 2. Pseudoparaphyllia filamentous; intra-marginal borders 3–5 cells wide, 2–3 cells thick, not confluent with the tips of costae in the leaf apex *N. moutieri*
 2. Pseudoparaphyllia narrowly foliose; intra-marginal borders 4–6 cells wide, 4–6 cells thick, usually confluent with the tips of costae in the leaf apex *N. takahashii*
1. Leaves without an intra-marginal border or only rather faintly bordered by short cells
 3. Costae faint, slender, rarely extending beyond leaf middle, sometimes short, double
 4. Leaves smooth when wet, obovate, lingulate or arcuately cultriform, up to 2.5 mm long; leaf apices often broadly acute to apiculate, rarely rounded *N. nitidula*
 4. Leaves transversally or irregularly undulate when wet, mostly lingulate, more than 2.5 mm long; leaf apices usually rounded or truncate
 5. Leaves only faintly and irregularly transversally undulate, distinctly octostichous to pseudotetrastichous; leaf apices mostly rounded, not truncate; secondary stems up to 5(–10) cm long *N. obtusata*
 5. Leaves often regularly transversally undulate, pseudotetrastichous; leaf apices usually truncate, rarely rounded; secondary stems mostly more than 15 cm long
 6. Median leaf cells mostly (30–)35–45 μm long; capsules exserted; setae ca. 2 mm long; inner perichaetial leaves ca. 1.5 mm long *N. calcicola*
 6. Median leaf cells mostly 15–30(–35) μm long; capsules immersed; setae less than 1 mm long; inner perichaetial leaves up to 4.5 mm long *N. lepineana*
 3. Costae strong, ending just below leaf apex, rather broad, at times forked above
 7. Leaves smooth, auricles absent
 8. Leaf apex transversally truncate *N. semperiana*
 8. Leaf apex rounded to obtuse *N. boniana*
 7. Leaves transversally undulate, auricles present, small
 9. Plants dioicous; stems slender, up to 30 cm long; branches short, attenuate, often flagelliform and bearing tufts of gemmiform branchlets *N. gracilentia*
 9. Plants autoicous; stems thick, rigid, up to 10 cm long; branches obtuse, rarely flagelliform, gemmiform branchlets absent
 10. Leaves deeply undulate; capsules cylindrical, exserted, with opercula obliquely rostrate; paraphyses filiform *N. exserta*
 10. Leaves moderately undulate; capsules ovoid, immersed, with opercula straightly rostrate; paraphyses ligulate to lanceolate *N. crinita*

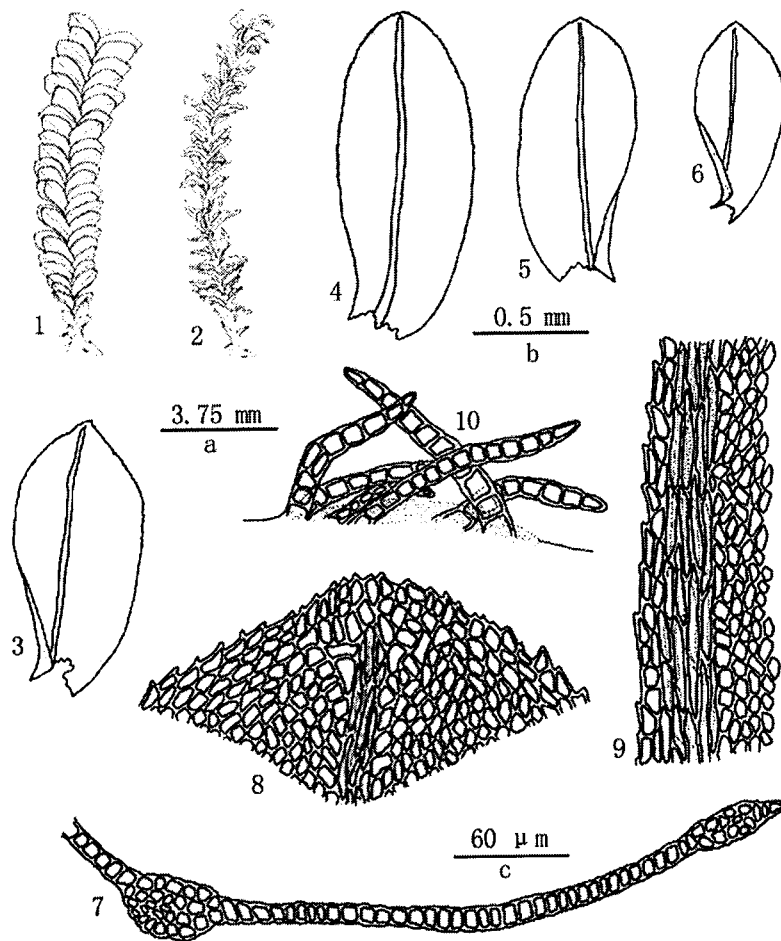


Fig. 1 *Neckeropsis moutieri* (Broth. & Par. in Par.) Fleisch

1-2. Habits, moist and dry; 3-6. Leaves; 7. Cross section of leaf; 8. Apical leaf cells; 9. Median leaf cells and margin; 10. Pseudoparaphyllia. (All drawn from S. He 40411 by Si HE) 1-2: bar a; 3-6: bar b; 7-10: bar c.

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References

- [1] Touw A. Revision of the moss genus *Neckeropsis* (Neckeraceae). I. Asiatic and Pacific species [J]. *Blumea*, 1962, 11:373-425.
- [2] Touw A. Additional notes on *Neckeropsis* [J]. *Lindbergia*, 1972, 1:184-188.
- [3] Touw A, Ochyra R. Additional notes on *Neckeropsis* 2 [J]. *Lindbergia*, 1987, 13:97-104.
- [4] Higuchi M, Iwatsuki Z, Ochyra R, et al. *Neckeropsis takahashii* (Neckeraceae, Musci), a new species from Yunnan, China [J]. *Nova Hedwigia*, 1989, 48:431-435.
- [5] Redfearn P L Jr, Tan B C, He S. A newly updated and annotated checklist of Chinese mosses [J]. *J Hatt Bot Lab*, 1996, 79:163-357.
- [6] Liu Q, Wang Y F, Zhu Y Q, et al. *Neckeropsis boniana* (Besch.) Touw & Ochyra (Neckeraceae, Musci) newly recorded in China [J]. *Chenia*, 2007, 9:349-351.