

GOLLANIA ADUNCA (MUSCI: HYPNACEAE), A NEW SPECIES FROM VIETNAM AND A GENUS NEW TO INDOCHINA

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Abstract. A new species of *Gollania* (Hypnaceae), *G. adunca* S. He from Vietnam is described and illustrated. The genus *Gollania* is reported here new to Indochina. *Gollania adunca* is closely related to *G. sinensis* Broth. & Paris and *G. varians* (Mitt.) Broth., but is distinguished by its strongly squarrose leaves with acute and aduncous leaf apices.

Key words: *Gollania*, Hypnaceae, Indochina, moss, Vietnam

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The genus *Gollania* Broth. of the Hypnaceae has been revised by Higuchi (1985) who recognized 17 species worldwide. Thereafter, four more species were published (Higuchi 2001, 2011; Higuchi & Long 1996; Higuchi & Wu 1995). *Gollania*, most closely related to and resembling *Hypnum* Hedw., is almost exclusively distributed in the temperate regions of East Asia, but it has never been reported until now from Indochina, including Vietnam.

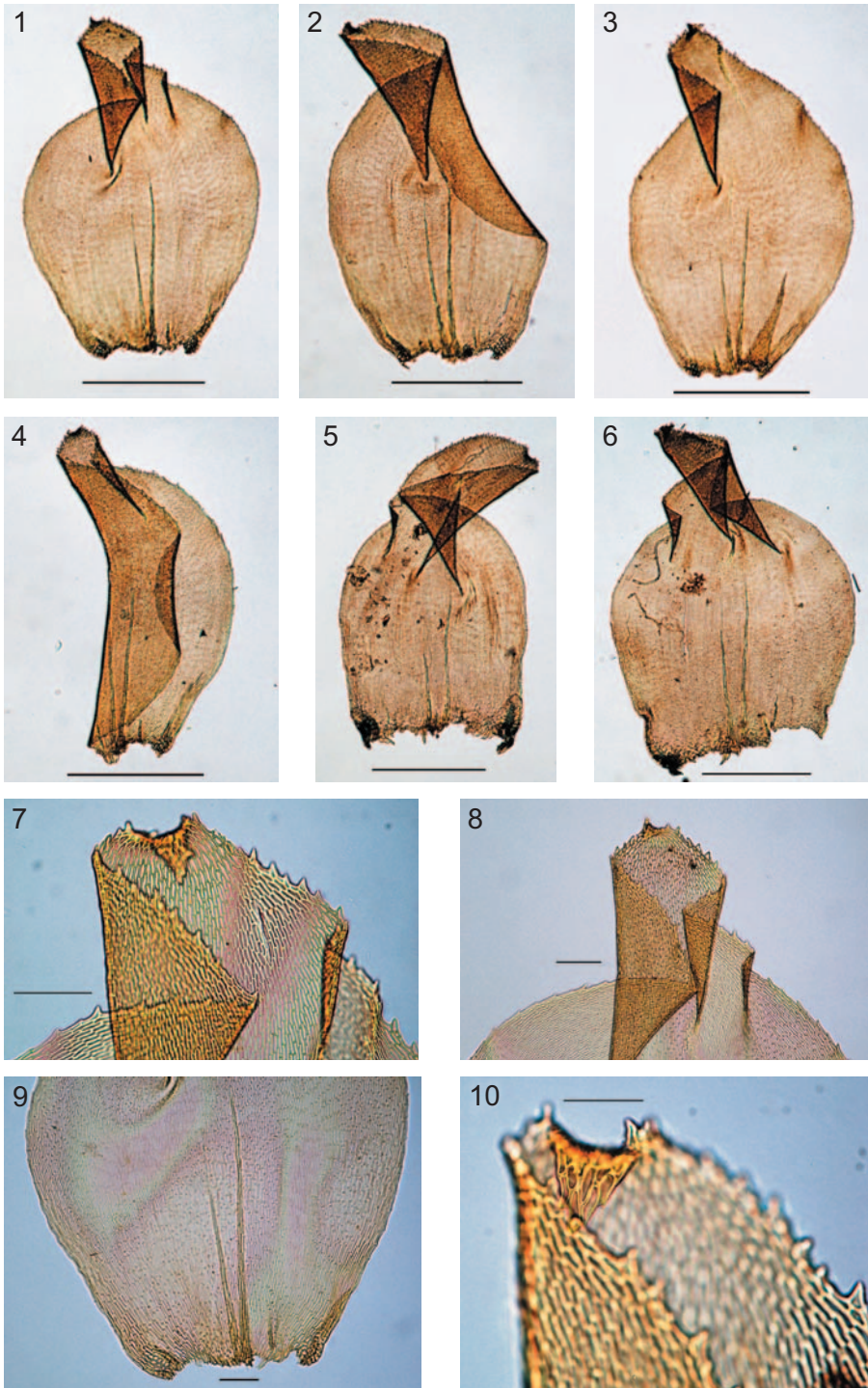
During my study of the moss specimens collected from Vietnam by Prof. Leonid Averyanov of Russia, I encountered a very interesting moss that I have never seen before. Although this moss is in sterile condition, it exhibits a combination of distinctive gametophytic characters that clearly give no questions about its belonging in the genus *Gollania*. These characters are: (i) stems irregularly branched and dorsiventrally elliptical in the cross section and with a slightly differentiated central strand, (ii) pseudoparaphyllia narrowly foliose, (iii) leaves strongly squarrose, broadly ovate-lanceolate with strong, double costae and acute leaf apices, and (iv) margins irregularly serrate above; and the alar region well-differentiated, with a group of rounded-quadrate cells. The most distinct feature of this moss is its broadly acute and aduncous leaf apices, a remarkable character has never been seen in any species of *Gollania*, perhaps in any pleurocarpous mosses. This moss

represents an undescribed species and it is herein described as a new species.

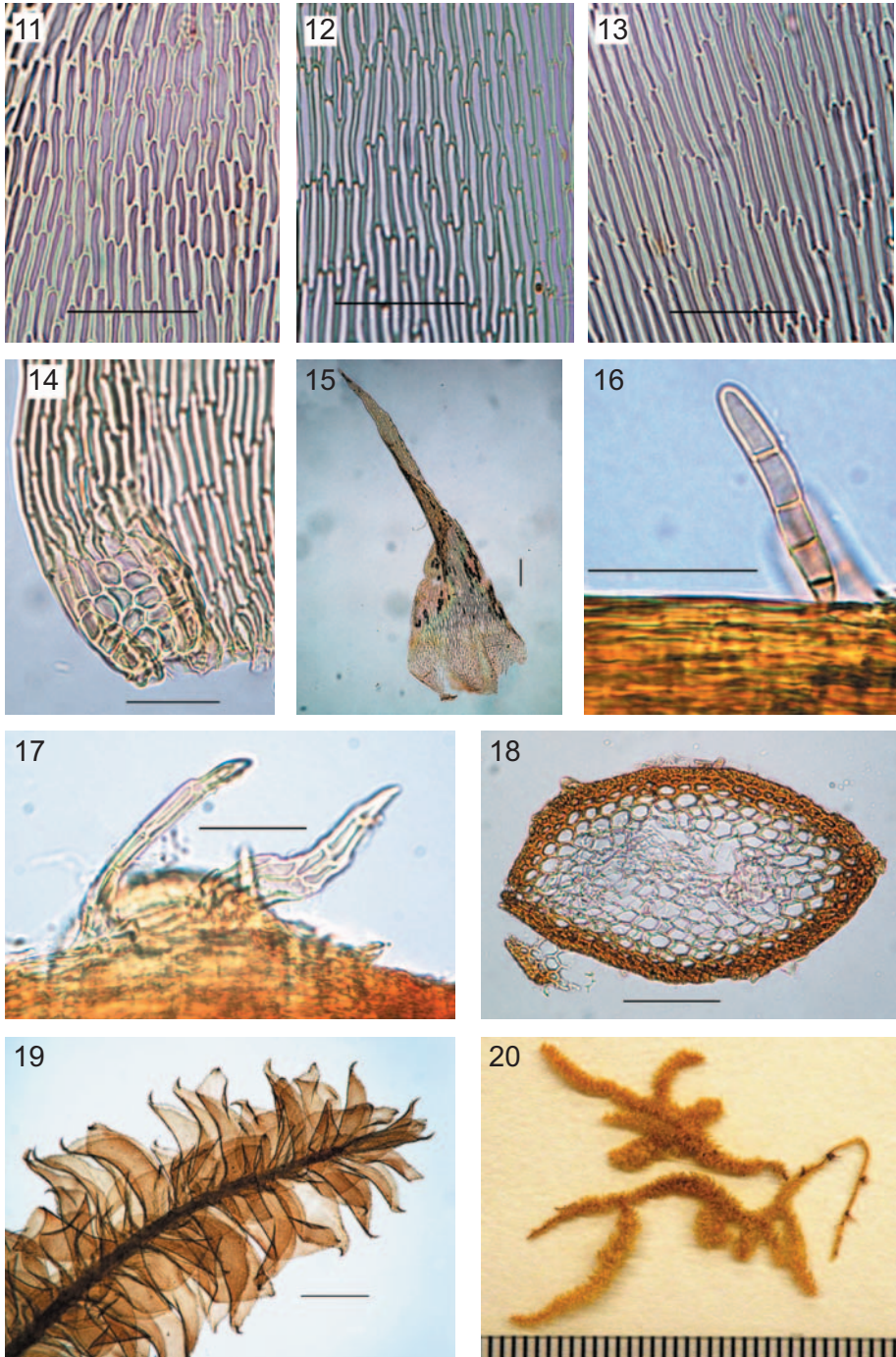
Gollania adunca* S. He, *sp. nov. Figs 1–20

TYPE: VIETNAM. KON TUM PROV.: Dominant in shadow deep canyons on NW slope of Ngoc Linh mountain system. Primary close evergreen forest, 1600–1700 m, 13 March 1995, Averyanov *et al.* B093 (HOLOTYPE MO; ISOTYPE LE).

Plants medium-sized, yellowish green to light brown, moderately glossy, in loose compact. Stems prostrate, up to 4 cm long, irregularly branched, dorsiventrally elliptical in cross section, outer cortex consisting of 3–4 layers of thick-walled cells, central strand somewhat differentiated; leafy stems and branches subjulaceous with squarrose leaves; pseudoparaphyllia narrowly foliose, 3–5 cells wide at base; axillary hairs 4–5 cells long, with a shorter, brownish basal cell. Stem and branch leaves similar, strongly squarrose, dorsal, ventral and lateral leaves not clearly differentiated, subcordate, rounded to broadly ovate at base, suddenly contracted to an acute apex, 1.5–2.0 × 0.8–1.1 mm; margins irregularly serrate above, finely serrulate to subentire below; costae double, strong, *ca* 1/2 the leaf length, usually unequal in length; leaf cells moderately thick-walled to thick-walled, smooth to weakly prorate; upper and



Figs 1–10. *Gollania adunca* S. He, *sp. nov.* 1–4 – secondary stem and branch leaves, 5–6 – stem leaves, 7–8 – upper parts of leaf, 9 – lower part of leaf, 10 – leaf apex. Scale bars: 1–6 = 0.5 mm; 7–9 = 0.1 mm; 10 = 0.05 mm.



Figs 11–20. *Gollania adunca* S. He, *sp. nov.* 11 – upper leaf cells, 12 – median leaf cells, 13 – basal juxtacostal leaf cells, 14 – basal angle and alar cells, 15 – inner perichaetial leaf, 16 – axillary hair, 17 – pseudoparaphyllia, 18 – cross section of stem, 19 – wet leafy branch, 20 – dry plant habit. Scale bars: 11–14 = 0.05 mm; 15 & 18 = 0.1 mm; 16 & 17 = 0.05 mm; 19 = 0.5 mm; 20 = 0.1 mm.

Table 1. Diagnostic characters of *Gollania adunca* S. He, *G. sinensis* Broth. & Paris, and *G. varians* (Mitt.) Broth.

Character	<i>G. adunca</i>	<i>G. sinensis</i>	<i>G. varians</i>
Leaves	Strongly squarrose, suddenly contracted to a broad acumen	Slightly squarrose, suddenly contracted to a short, narrowed acumen	Strongly squarrose, suddenly contracted to a blunt, acumen
Leaf apices	Aduncous	Flat	Flat
Leaf cells	Thick-walled, somewhat prorate	Thin-walled, smooth	Thick-walled, prorate
Pseudoparaphyllia	Narrowly foliose, 3–5 cells wide at base	Foliose, 6–8 cells wide at base	Foliose, 4–8 cells wide at base

apical cells linear-rhomboidal, $15\text{--}20 \times 5\text{--}6 \mu\text{m}$; median and basal cells linear, $35\text{--}50 \times 3\text{--}5 \mu\text{m}$, thick-walled, often porose near the leaf base; alar cells well-differentiated, numerous, in a group of rounded-quadrate cells, $12\text{--}15 \mu\text{m}$ wide. Dioicous. Inner perichaetial leaves triangularly lanceolate, $1.6\text{--}1.8 \times 0.30\text{--}0.35 \text{ mm}$, slightly reflexed at the upper slender parts; costae absent; margins finely serrulate above; laminal cells thin-walled. Sporophytes not seen.

ETYMOLOGY. The specific epithet *adunca* denotes the incurved, aduncous leaf apices.

DISTRIBUTION. Endemic to Vietnam.

HABITAT. Primary montane evergreen forest.

DISCUSSION. *Gollania adunca* is characterized by the strongly squarrose, broadly ovate-lanceolate leaves with acute and aduncous leaf apices, the latter is a unique feature in the genus *Gollania*. The new species is distinct from other species of *Gollania* in the combination of following characters, such as the strongly squarrose and slightly plicate leaves, with broadly rounded-ovate leaf bases and suddenly contracted to an acute, aduncous apex, and the thick-walled leaf cells. *Gollania adunca* is most closely related to *G. sinensis* Broth. & Paris and *G. varians* (Mitt.) Broth. The diagnostic characters of three related species are shown in Table 1. *Gollania sinensis* is a species endemic to China from central to southwestern regions; and *G. varians* has been reported from Japan, Korea, and China (Higuchi 1985; Zhang & He 2005). It can be anticipated that

more species of *Gollania* would be discovered from Vietnam with the development of a more detailed study of the moss flora of the country in the coming years by the present author. With the description of this new species, *Gollania* is new to Indochina. The distribution range of the genus now extends from the temperate regions of East Asia to subtropical regions of South Asia.

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