

## Does the Moss Genus *Lepidopilum* (Brid.) Brid. (Pilotrichaceae) Occur in Asia?

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### Abstract

The Asian species of *Lepidopilum* (Brid.) Brid. are reviewed. Hitherto, *L. novae-guineae* E.B. Bartram is the only remaining Asian species in the predominantly neotropical genus. However, examination of the type specimen of this taxon proves it to be a synonym of *Dimorphocladon borneense* Dixon.

### Introduction

The genus *Lepidopilum* (Brid.) Brid. (Pilotrichaceae *sensu* Buck *et al.*, 2005) is a predominantly neotropical moss genus, with a few reported outlier representatives in the paleotropics. Although the checklist of mosses (Crosby *et al.*, 1999) listed 61 accepted valid species names known in the world, Churchill (1992) had estimated that about 35-40 will remain as good species.

The main distinguishing characters of the genus include: (1) prostrate primary axes with ascending secondary axes; (2) distinct double costae extending at most to midleaf; (3) median laminal cells smooth and narrowly hexagonal; and (4) leaf border indistinct (Welch, 1962, 1966). In addition, *Lepidopilum* is traditionally separated from the gametophytically similar *Lepidopilidium* (Müll. Hal.) Broth. solely by its papillose peristome teeth, which are neither striolate nor furrowed. Buck *et al.* (2005) had remarked that the true delimitation between these two genera is yet to be resolved with certainty.

Due to our research interest on the Hookeriaceae *sensu lato* in Asia, we noted that only a single species of *Lepidopilum* is accepted today from Asia. Hitherto, 11 Asian species names had been published either originally as, or transferred later to the genus *Lepidopilum* (Wijk *et al.*, 1964, 1969).

According to the present day taxonomy, all, except one taxon, have been referred to other Hookeriaceous genera (Table 1). Remarkably, many of them are, in fact, the synonyms of *Hookeriopsis utacamundiana* (Mont.) Broth. [syn. *Thamniopsis utacamundiana* (Mont.) W.R. Buck], a very variable species in the same family Pilotrichaceae. It is also interesting to note that the two known species of *Actinodontium* Schwägr. in tropical Asia were also once considered by Brotherus (1907) to belong to *Lepidopilum*, but no one seems to have accepted this view today. The only remaining *Lepidopilum* species left in Asia is *L. novae-guineae* E.B. Bartram from Papua New Guinea, a species that is known only from the type collection. Its generic affinity needs re-examination at present.

When Bartram (1961) described *L. novae-guineae*, he had noted the narrow leaf outline, the elongate laminal cells, and the smooth seta, as characters that do not fit into *Lepidopilum*. He had, nevertheless, decided to tentatively place it in this genus based on the well-developed double costae, the calyptral ornamentation, and the zig-zag median line of the peristome teeth.

### Material and Method

To be able to ascertain the true identity of *L. novae-guineae*, we have requested for a study of the holotype material from the Farlow Herbarium of Cryptogamic Botany (FH).

### Results and Discussion

In addition to Bartram's (1961) observations on the above stated "non-*Lepidopilum* characters", other striking features of the type material include: (1) prorate laminal cells, (2) the bi-geminate teeth at leaf margins, and (3) the dimorphic branches, namely laxly foliated, short complanate ones and densely foliated, longer penicillate ones. All together, this species stands clearly out of place in *Lepidopilum*. Moreover, the type specimen is an epiphyllous moss, a habitat rather uncommonly seen in species of *Lepidopilum*.

After considering all the distinctive morphological and ecological features, we have come to the conclusion that *L. novae-guineae* belongs to the genus *Dimorphocladon* Dixon (Symphyodontaceae *sensu* Buck & Goffinet, 2000). Upon comparing the type of *L. novae-guineae* with the description and authentic specimens of *Dimorphocladon borneense* Dixon

(1922). also an epiphyllous moss, we find no significant difference in their morphology, thus, we are proposing the following new synonymy.

*Dimorphocladon borneense* Dixon, J. Bot. 60 (1922) 109, t. 564: f. 5 a-f.  
– **Type:** Borneo. Upper Sarawak, *A.H. Everett*, mixed with *Taxithelium* sp. (holo, NY-Mitten n.s.)

*Lepidopilum novae-guineae* E.B. Bartram, Brittonia 13 (1961) 373, **syn. nov.** – *Chaetomitrium novae-guineae* (E.B. Bartram) S.P. Churchill. Rev. Moss Gen. *Lepidopilum* (1988) 185, **nom. inval.** – **Type:** Papua New Guinea. Sepik District: Wewak-Angoram Area, near Nagipem village, Prince Alexander Range, Maprik-But track, on palm frond, rain forest, 1500 ft. 28 Jul 1959, *Robbins 1990* (holo, FH!). **Figs. 1 & 2.**



**Figure 1.** Habit of *Lepidopilum novae-guineae* E.B. Bartram showing the two kinds of branches, one with elongate penicillate tip (based on *Robbins 1990*, holotype at FH). (Photo: Y.H.Lim)



**Figure 2.** Habit of lateral, penicillate branches of *Lepidopilum novae-guineae* (*Robbins 1990*, FH) showing the two kinds of leaves seen also in plant specimen of *Dimorphocladon borneense*. (Photo: Y.H.Lim)

With the inclusion of *L. novae-guineae*, the genus *Dimorphocladon* still remains a monotypic taxon. The taxon is known today from New Guinea, Seram, Philippines (Palawan), Borneo, Sumatra, Malay Peninsula, and Thailand (*Akiyama, 1997; Dixon, 1922, 1932, 1935; Schultze-Motel, 1963; Tan, 1993*).

Churchill (1988), in his unpublished doctoral thesis on the revision of *Lepidopilum*, had already excluded *L. novae-guineae* from the genus. In fact, he made a new combination for this species in *Chaetomitrium* Dozy & Molk. as *C. novae-guineae*. Although, this new binomial was not effectively published according to the current ICBN rules, his taxonomic interpretation of the New Guinean material as a species of *Chaetomitrium* is rather close to the correct identity of this taxon.

We concur with Dixon (1922) that *Dimorphocladon* is closely allied to *Chaetomitrium*. Furthermore, we agree with Tan and Robinson (1990) and in part with Buck & Goffinet (2000) in placing them together with *Chaetomiriopsis* M. Fleisch. in the same family, Symphyodontaceae, close to the Hypnaceae.

**Table 1.** Asian moss species that were once placed in *Lepidopilum*.

Previously in <i>Lepidopilum</i>	Currently accepted
<i>L. adscendens</i> (Schwägr.) Broth.	=> <i>Actinodontium adscendens</i> Schwägr.
<i>L. furcatum</i> Thwaites & Mitt.	=> <i>Lepidopilidium furcatum</i> (Thwaites & Mitt.) Broth.
<i>L. macropus</i> Bosch & Sande Lac.	=> <i>Hookeriopsis utacamundiana</i> (Mont.) Broth.
<i>L. novae-guineae</i> E.B. Bartram	=> <i>Dimorphocladon borneense</i> Dixon [proposed here]
<i>L. purpuratum</i> Mitt.	=> <i>Hookeriopsis utacamundiana</i> (Mont.) Broth.
<i>L. raphidostegum</i> (Müll. Hal.) Broth.	=> <i>Actinodontium raphidostegum</i> (Müll. Hal.) Bosch & Sande Lac.
<i>L. secundum</i> (Griff.) Mitt.	=> <i>Hookeriopsis utacamundiana</i> (Mont.) Broth.
<i>L. spinosum</i> (Müll. Hal.) A. Jaeger	=> <i>Cyathophorum spinosum</i> (Müll. Hal.) M.Fleisch.
<i>L. smnatranum</i> Bosch & Sande Lac.	=> <i>Hookeriopsis utacamundiana</i> (Mont.) Broth.
<i>L. thwaitesianum</i> Mitt.	=> <i>Hookeriopsis thwaitesiana</i> (Mitt.) Broth.
<i>L. utacamundianum</i> (Mont.) Mitt.	=> <i>Hookeriopsis utacamundiana</i> (Mont.) Broth.

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