

Mosses from Pakistan collected by Botanical Expedition of National Science Museum, Tokyo in 1990. 2. Encalyptaceae, Fontinalaceae, Neckeraceae and Sematophyllaceae

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Abstract Five genera and seven species in the families Encalyptaceae, Fontinalaceae, Neckeraceae and Sematophyllaceae are recognized based on the collections from Pakistan in 1990. Among them the family Fontinalaceae and two species, *Encalypta ciliata* and *Fontinalis antipyretica*, are newly recorded from Pakistan.

Key words: bryophytes, mosses, Pakistan.

This paper deals with the encalyptaceous, fontinalaceous, neckeraceous and sematophyllaceous mosses collected in Pakistan from July to September 1990. Nineteen specimens examined comprise five genera and seven species. Among them the family Fontinalaceae and two species are newly recorded from Pakistan. Recently Higuchi & Nishimura (2003) reported that the moss flora of Pakistan comprises 339 taxa in 124 genera and 33 families. Consequently it comprises 341 taxa in 125 genera and 34 families.

The specimens examined are deposited in the herbarium of National Science Museum, Tokyo (TNS), and some duplicates in the herbarium of Pakistan Museum of Natural History (PMNH). In the following enumeration an asterisk (*) preceding a species indicates “new to Pakistan.” For each species, collection localities, specimen numbers and distribution are provided.

Encalyptaceae

Encalypta alpina Sm. in Sm. & J.C.Sowerby, Engl. Bot. 20: 1419, 1805.

N. W. Frontier Prov.: Dunga Gali (north of Murree), 2300 m, on limestone cliff, Aug. 20, 1990, *Higuchi 19778*.

Distribution. Widely distributed in the North-

ern Hemisphere.

* *Encalypta ciliata* Hedw., Sp. Musc. 61, 1801.
(Figs. 1–3)

N. W. Frontier Prov.: Swat Valley, Lake Mahodand (north of Matiltan), 2850 m, on soil, Aug. 10, 1990, *Higuchi 19521, 19527*.

Distribution. Widely distributed in the Northern Hemisphere, and South America. New to Pakistan.

This species is characterized by having fringed calyptra (Fig. 1), costa excurrent, smooth capsule and single peristome (Fig. 3) (cf. Horton, 1983).

Encalypta streptocarpa Hedw., Sp. Musc. 62, 1801.

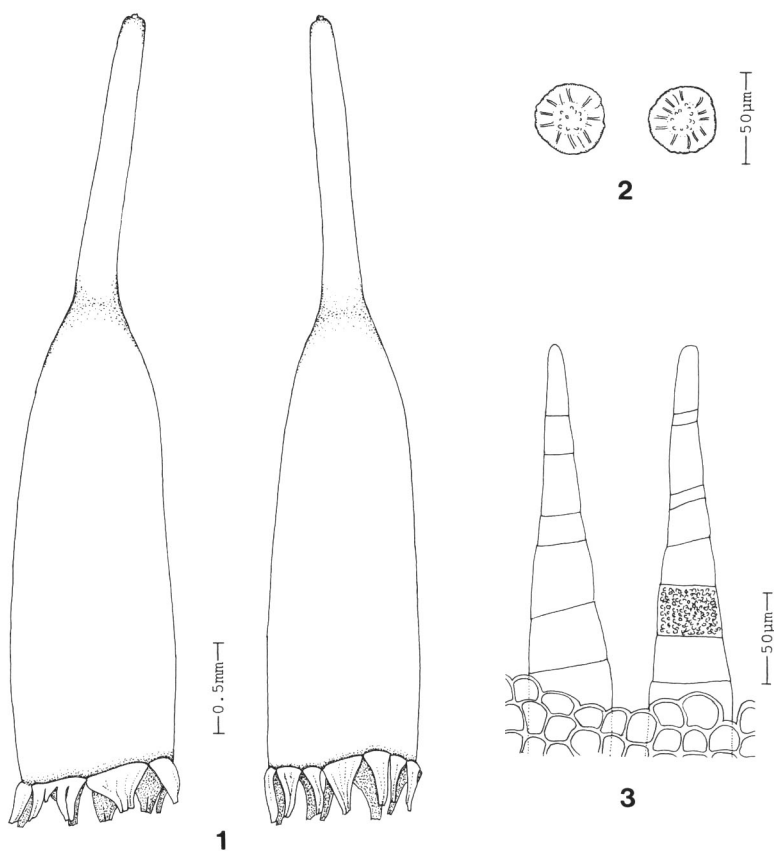
Mt. Nanga Parbat, Rupal, 3070 m, on soil, Sept. 12, 1990, *Higuchi 20355*.

Distribution. Europe, Pakistan, Japan and North America.

Fontinalaceae

* *Fontinalis antipyretica* Hedw., Sp. Musc. 298, 1801.
(Figs. 4–6)

N. W. Frontier Prov.: Swat Valley, Matiltan, 2100 m, on submerged boulder in stream, Aug. 9, 1990, *Higuchi 19503 (coll. T. Bando), 19507*;



Figs. 1–3. *Encalypta ciliata*. 1. Calyptrae when dry. 2. Spores. 3. Peristome. All drawn from Higuchi 19527.

Utrot, 2400 m, on wet boulder, Aug. 12, 1990, Higuchi 19620 (coll. T. Nakaike); Desan Forest (south of Utrot), 2400 m, on submerged boulder in stream, Aug. 14, 1990, Higuchi 19713.

Distribution. Widely distributed in the Northern Hemisphere. New to Pakistan.

This species is characterized by having leaves keeled at the middle and often conduplicate and the keel curved from the insertion of the leaf to its apex (Fig. 6). Higuchi & Nishimura (2003) have pointed out that the moss flora of Pakistan lacks only Fontinalaceae as compared with that of Afghanistan.

Neckeraceae

Cryptoptodon pluvii (Brid.) Broth. in Engler & Prantl, Nat. Pfl. 1(3): 838, 1906.

N. W. Frontier Prov.: Dunga Gali (north of

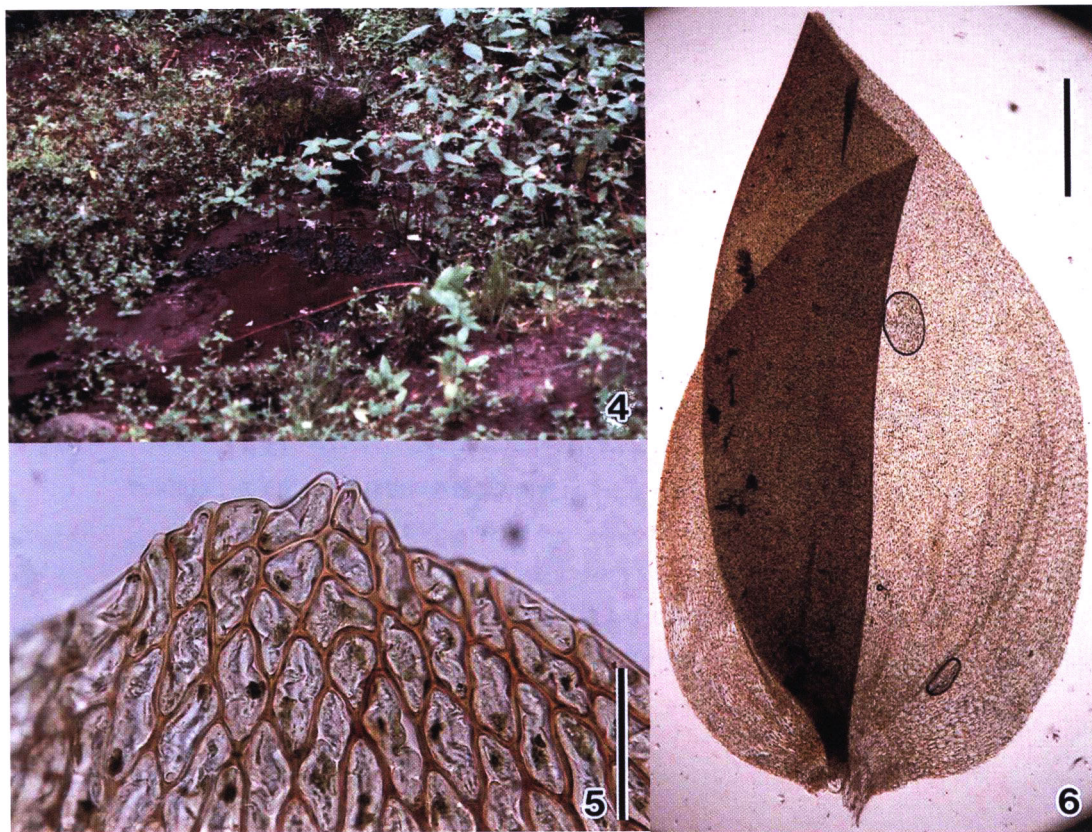
Murree), 2300 m, on boulder, Aug. 3, 1990, Higuchi 19393, 2420 m, on tree-trunk, Higuchi 19363; Changla Gali (north of Murree), 2420 m, on tree-trunk, Aug. 3, 1990, Higuchi 19364.

Distribution. Himalayas and Africa (Enroth, 1992).

Slender branches with suppressed leaves were found on the plants (Higuchi 19393), which are restricted on the old brownish stems. It is considered to be a kind of vegetative reproductive organs, “flagella” (cf. Imura, 1994).

Homalia trichomanoides (Hedw.) Schimp. in Bruch & Schimp., Bryol. Eur. 5: 55, 1850.

N. W. Frontier Prov.: Kaghan Valley, Shogran, 2700 m, on rock-cliff, Aug. 29, 1990, Higuchi 19992, 19997; Sharan, 2370 m, on boulder, Sept. 3, 1990, Higuchi 20287; Kamal Ban Forest (southwest of Kaghan), 2100 m, on rock-cliff,



Figs. 4–6. *Fontinalis antipyretica*. 4. Habitat. 5. Apical part of stem leaf. 6. Stem leaf. All drawn from Higuchi 19713. Scale bars for fig. 5=50 μ m; fig. 6=1 mm.

Sept. 2, 1990, Higuchi 20191.

Distribution. Widely distributed in the Northern Hemisphere.

Sematophyllaceae

Brotherella nictans (Mitt.) Broth., Nat. Pfl. Ed. 2, 11: 425, 1925. Det. by T. Seki.

N. W. Frontier Prov.: Kaghan Valley, Shogran, 2200 m, on decaying stump, Aug. 31, 1990, Higuchi 20063, 20064, 20067; Sharan, 2370 m, on decaying log, Sept. 3, 1990, Higuchi 20292.

Distribution. Pakistan, Nepal, Sikkim and China (Yunnan, Sichuan).

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fied *Brotherella nictans*. This study was supported in part by Grant-in Aid (no. 13640707) from the Ministry of Education, Science, Sports and Culture, Japan, and collection of plants was no. 02041091.

References

- Enroth, J. 1992. Correction to *Cryptoleptodon*, *Forstroemia* and *Leptodon* (Leptodontaceae, Musci). *J. Hattori Bot. Lab.* **71**: 75–82.
- Higuchi, M. & N. Nishimura. 2003. Mosses of Pakistan. *J. Hattori Bot. Lab.* **93**: 273–291.
- Horton, D. G. 1983. A revision of the Encalyptaceae (Musci), with particular reference to the North American taxa. Part II. *J. Hattori Bot. Lab.* **54**: 353–532.
- Imura, S. 1994. Vegetative diaspores in Japanese mosses. *J. Hattori Bot. Lab.* **77**: 177–232.

