

Studies on the Bryophyte Flora of Vanuatu. 4. Hypnaceae (Musci)

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This paper deals with taxa of the family Hypnaceae occurring in Vanuatu, based on the collections made by Higuchi in 1996 and by Mr. K. Sugimura in 1997 (cf. Higuchi 2002).

HYPNACEAE

Higuchi (1996) lists seven genera and 26 species in the family Hypnaceae as occurring in Vanuatu. Nishimura (1985) noted that *Ctenidium polychaetum* (Bosch & Sande Lac.) Broth. occurred on Espiritu Santo and Anatom. The Hypnaceae recorded for Vanuatu presently includes 27 species in eight genera. By the examination of above collections, 10 species in seven genera were recognized. *Phyllocladon lingulatus* is a new record for the moss flora of Vanuatu.

Key to the genera of Hypnaceae in Vanuatu

1. Leaves obtuse or truncate at apex; laminal cells prorate on back at both ends *Phyllocladon*
1. Leaves acute to acuminate at apex; laminal cells smooth or prorate on back at upper end 2
2. Median laminal cells lax, oblong-hexagonal or elongate-rectangular *Vesicularia*
2. Median laminal cells dense, linear, sublinear, or linear rhomboidal 3
3. Leaves erect-spreading to wide-spreading; leaf margins mostly serrate to serrulate *Ctenidium*
3. Leaves complanate; leaf margins entire or serrulate at upper portion 4
4. Pseudoparaphyllia absent; bulbils present *Pseudotaxiphyllum*
4. Pseudoparaphyllia present; bulbils absent 5
5. Pseudoparaphyllia filamentous; fusiform gemmae sometimes present *Isopterygium*
5. Pseudoparaphyllia foliose; gemmae absent 6
6. One cell at extreme basal corners of leaves conspicuously inflated, thin-walled, decurrent on stem
..... *Ectropothecium*
6. One cell at extreme basal corners of leaves not inflated nor decurrent on stem *Taxiphyllum*

1. *Phyllocladon lingulatus* (Cardot) W.R.Buck, Mem. New York Bot. Gard. 45: 521 (1987).

Specimen examined. Espiritu Santo Isl., 2nd Camp - Mt. Vutimena, 870 m alt., Oct. 18, 1997 (Sugimura 1662).

Distribution. Japan, Taiwan, Vietnam, Philippines (cf. Iwatsuki 2001). New to Vanuatu.

Notes. *Phyllocladon lingulatus* is distinguished by having lingulate leaves with bifid teeth on the upper

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margins and laminal cells prorate on back at both ends. Although lingulate leaves are rare in the material examined here (Sugimura 1662), other features show the typical habit of *P. lingulatus*.

2. *Vesicularia inflectens* (Brid.) Müll.Hal., Bot. Jahrb. 23: 330 (1896).

Specimens examined. Espiritu Santo Isl., 2nd Camp - Mt. Vutimena, 530 m alt., Oct. 19, 1997 (Sugimura 1678); Butmas, 560 m alt., Oct. 23, 1997 (Sugimura 1730).

Distribution. China, Caroline Islands, New Guinea, Solomon Islands, Australia, New Caledonia, Vanuatu, Fiji, Samoa, Admiralty Islands, Society Islands, Tubuai, Rapa, Rotuma (cf. Whittier 1976).

3. *Ctenidium polychaetum* (Bosch & Sande Lac.) Broth. in Engler & Prantl, Nat. Pfl. 1(3): 1048 (1908).

Specimens examined. Espiritu Santo Isl., Mt. Vutimele, 1100 m alt., Nov. 24, 1996 (Higuchi 32226), Nov. 25, 1996 (Higuchi 32256, 32283), 1200 m alt., Nov. 23, 1996 (Higuchi 32191); 2nd Camp - Mt. Vutimena, 560 m alt., Oct. 18, 1997 (Sugimura 1616).

Distribution. Java, Borneo, Ceram, Philippines, Vanuatu (cf. Nishimura 1985).

Notes. This species is closely related to *C. novoguineense* Nishimura in having the papillose setae, but *C. novoguineense* has larger stem-leaves with wider bases and with more weakly serrulate leaf margins than *C. polychaetum*.

4. *Pseudotaxiphyllum pohliaecarpum* (Sull. & Lesq.) Z. Iwats., J. Hattori Bot. Lab. 63: 449 (1987).

Specimens examined. Espiritu Santo Isl., Mt. Tabwemasana, 1700 m alt., Nov. 7, 1996 (Higuchi 31658, 31692).

Distribution. Tropical and subtropical Asia (cf. Iwatsuki 2001).

Notes. Tixier (1973) reported this species from Espiritu Santo as *Isopterygium pohliaecarpum*.

5. *Isopterygium albescens* (Hook.) A. Jaeger, Ber. S. Gall. Naturw. Ges. 1876-77: 433 (1878).

Specimens examined. Espiritu Santo Isl., Peavot - Mt. Vutimele, 230 m alt., Nov. 20, 1996 (Higuchi 31961); Mt. Tabwemasana, 1000 m alt., Nov. 9, 1996 (Higuchi 31862), 1400 m alt., Nov. 7, 1996 (Higuchi 31620).

Distribution. Tropical and subtropical East Asia, Hawaii (cf. Iwatsuki 2001).

6. *Isopterygium minutirameum* (Müll.Hal.) A. Jaeger, Ber. S. Gall. Naturw. Ges. 1876-77: 434 (1878).

Specimens examined. Espiritu Santo Isl., Peavot, 50 m alt., Nov. 27, 1996 (Higuchi 32332, 32335); Peavot - Mt. Vutimele, 750 m alt., Nov. 21, 1996 (Higuchi 31996); Matantas, 2 m alt., Nov. 18, 1996 (Higuchi 31941); Mt. Tabwemasana, 400 m alt., Nov. 5, 1996 (Higuchi 31485).

Distribution. Tropical and subtropical Asia, Australia (cf. Iwatsuki 2001).

7. *Ectropothecium pacificum* Mitt., J. Linn. Soc. Bot. 10: 180 (1868).

Specimens examined. Espiritu Santo Isl., Peavot - Mt. Vutimele, 1000 m alt., Nov. 21, 1996 (Higuchi 32035), Mt. Vutimele, 1100 m alt., Nov. 24, 1996 (Higuchi 32222, 32239, 32243), Nov. 25, 1996 (Higuchi 32261, 32267), 1400 m alt., Nov. 23, 1996 (Higuchi 32121, 32123, 32124, 32127); 2nd Camp - Mt. Vutimena, 580 m alt., Oct. 16, 1997 (Sugimura 1509), 800 m alt., Oct. 18, 1997 (Sugimura 1626); Mt. Tabwemasana, 1000 m alt., Nov. 6, 1996 (Higuchi 31561), Nov. 8, 1996 (Higuchi 31802, 31838),

1440 m alt., Nov. 7, 1996 (Higuchi 31746), 1500 m alt. (Higuchi 31732, 31733), 1650 m alt. (Higuchi 31698), 1700 m alt. (Higuchi 31647, 31667, 31672, 31684, 31697).

Distribution. New Caledonia, Vanuatu, Samoa (cf. Higuchi and Iwatsuki 1994).

Notes. *Ectropothecium pacificum* is characterized by large and glossy plants, strongly falcate and acuminate leaves, and thick-walled and porose laminal cells. The specimens examined here, collected from 580 m alt. to 1700 m alt., occurred at the high altitude.

8. *Ectropothecium sodale* (Sull.) Mitt., J. Linn. Soc. Bot. 10: 180 (1868).

Specimens examined. Espiritu Santo Isl., Peavot - Mt. Vutimele, 600 m alt., Nov. 21, 1996 (Higuchi 31983), 800–1000 m alt., Nov. 26, 1996 (Higuchi 32297); Mt. Vutimele, 1100 m alt., Nov. 24, 1996 (Higuchi 32216); 2nd Camp - Mt. Vutimena, 550 m alt., Oct. 18, 1997 (Sugimura 1617); Kerepua - Mt. Tabwemasana, 600 m alt., Nov. 10, 1996 (Higuchi 31925), 700 m alt. (Higuchi 31921), 800 m alt. (Higuchi 31916); Mt. Tabwemasana, 1000 m alt., Nov. 6, 1996 (Higuchi 31529, 31546, 31557, 31574, 31576, 31577, 31868), Nov. 8, 1996 (Higuchi 31771, 31772, 31781, 31784, 31791, 31794, 31795, 31797), Nov. 9, 1996 (Higuchi 31857, 31876, 31877, 31878, 31880, 31892, 31915), 1440 m alt., Nov. 7, 1996 (Higuchi 31741); Tangoa, 20 m alt., Oct. 12, 1996 (Sugimura 1462).

Distribution. New Guinea, New Caledonia, Vanuatu, Fiji, Samoa, Society Islands, Marquesas Islands (cf. Higuchi and Iwatsuki 1994).

Notes. This species is distinguished by small plants, strongly falcate and acuminate leaves, and laminal cells distinctly prorate at upper ends.

9. *Ectropothecium zollingeri* (Müll.Hal.) A.Jaeger, Ber. S. Gall. Naturw. Ges. 1877–78: 272 (1880).

Specimens examined. Espiritu Santo Isl., Peavot, 50 m alt., Nov. 27, 1996 (Higuchi 32330); Tsureviu - 1st Camp, 150 m alt., Oct. 14, 1997 (Sugimura 1469); 1st Camp - 2nd Camp, along Pialapa River, 140 m alt., Oct. 19, 1997 (Sugimura 1702), 170 m alt., Oct. 15, 1997 (Sugimura 1484); Kerepua - Mt. Tabwemasana, 800 m alt., Nov. 10, 1996 (Higuchi 31918); Mt. Tabwemasana, 780 m alt., Nov. 5, 1996 (Higuchi 31492, 31494, 31496), 1000 m alt., Nov. 8, 1996 (Higuchi 31810, 31823), Nov. 9, 1996 (Higuchi 31853).

Distribution. Tropical Asia (north to Japan), New Caledonia, Japan (cf. Higuchi and Iwatsuki 1994).

Notes. This species is characterized by acute, ovate-lanceolate, asymmetrical leaves, and distinct and forked costae. Tixier (1974) reported *Glossadelphus obscurum* (Broth. & Paris) Broth. (= *Ectropothecium obscurum* Broth. & Paris) from Espiritu Santo. Higuchi and Iwatsuki (1994) referred it to *E. zollingeri*.

10. *Taxiphyllum taxirameum* (Mitt.) M. Fleisch., Musci Fl. Buitenzorg 4: 1435 (1923).

Specimens examined. Espiritu Santo Isl., Peavot, 2 m alt., Nov. 27, 1996 (Higuchi 32352); Tsureviu - 1st Camp, 150 m alt., Oct. 14, 1997 (Sugimura 1468); Mt. Tabwemasana, 780 m alt., Nov. 5, 1996 (Higuchi 31498), 1000 m alt., Nov. 8, 1996 (Higuchi 31768, 31769), Nov. 9, 1996 (Higuchi 31904).

Distribution. Asia, East N. America, C. and S. America (cf. Iwatsuki 2001).

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Summary

Ten species in seven genera in the family Hypnaceae were reported based on the collections made in Vanuatu by M. Higuchi in 1996 and by K. Sugimura in 1997. A key to the seven genera of the family was presented. *Phyllodon lingulatus* (Cardot) W.R.Buck is a new record for the moss flora of Vanuatu.

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