

Studies on the Bryophyte Flora of Vanuatu. 3. Fissidentaceae (Musci)

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This paper deals with the family Fissidentaceae in Vanuatu based on the collections made by Dr. M. Higuchi in 1996 and Mr. K. Sugimura in 1997. Details of the collections are listed in the first part of this series (Higuchi 2002).

Following is the list of *Fissidens* species in the collections. Species identified with an asterisk (*) are new additions to the moss flora of Vanuatu.

Genus *Fissidens* Hedw., Sp. Musc. Frond.: 152, 1801.

*1. *F. bryoides* Hedw. var. *schmidii* (Müll.Hal.) R.S.Chopra & S.S.Kumar, Mosses West. Himalayas Adjacent Plains: 43 (1981).

Specimen examined. Espiritu Sant Isl., 2nd Camp - 1st Camp, along Pialapa River, 190 m alt., on rock, Oct. 19, 1997 (Sugimura 1698).

*2. *F. ceylonensis* Dozy & Molk., Ann. Sc. Nat. Bot. sér. 3, 2: 304 (1844).

Syn. *F. philonotulus* Besch., Bull. Soc. Bot. France 48: 13 (1901).

Specimen examined. Efate Isl., Mt. Bernier, 330 m alt., on soil, Oct. 28, 1997 (Sugimura 1759).

3. *F. crispulus* Brid. var. *crispulus*, Mant. Musc. 187 (1819).

Syn. *F. zippelianus* Dozy & Molk. in Zoll., Syst. Verz. 29 (1854).

Specimens examined. Espiritu Santo Isl., Peavot - Mt. Vutimele, 400 m alt., on rock, Nov. 20, 1996 (Higuchi 31967); 1st Camp - 2nd Camp, along Pialapa River, 420 m alt., on soil, Oct. 15, 1997 (Sugimura 1501).

4. *F. crispulus* var. *robinsonii* (Broth.) Z.Iwats. & Z.H.Li, Moss Flora of China, English Version 2: 26 (2001).

Syn. *F. robinsonii* Broth., Pilipp. J. Sci. 13: 204 (1918).

Specimens examined. Espiritu Santo Isl., Mt. Vutimele, 1100 m alt., on rocky cliff, Nov. 22, 1996 (Higuchi 32083f), on soil, Nov. 25, 1996 (Higuchi 32246), 1200 m alt., on rock at stream, Nov. 23, 1996 (Higuchi 32167); 2nd Camp - Mt. Vutimele, steep slope, 670 m alt., on soil, Oct. 18, 1997 (Sugimura 1624 + *F. pellucidus*); 2nd Camp - 1st Camp, along Pialapa River, 440 m alt., on soil, Oct. 19, 1997 (Sugimura 1685); Mt. Tabwemasana, 1000 m alt., on rock, Nov. 6, 1996 (Higuchi 31573), on rocky cliff, Nov. 8, 1996 (Higuchi 31808).

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***5. *F. gardneri* Mitt., J. Linn. Soc. Bot. 12: 593 (1869).**

Specimens examined. Espiritu Santo Isl., Peavot, ca. 50 m alt., on root of tree, Nov. 27, 1996 (Higuchi 32338); Kerepua - Mt. Tabwemasana, 200 m alt., on tree trunk, Nov. 4, 1996 (Higuchi 31476); Mt. Tabwemasana, 950 m alt., on rock, Nov. 6, 1996 (Higuchi 31514 + *F. hyalinus*).

6. *F. hyalinus* Hook. & Wils. in Hook., J. Bot. 3: 89 (1840).

Specimens examined. Espiritu Santo Isl., Mt. Vutimele, 1100 m alt., on rocky cliff, Nov. 24, 1996 (Higuchi 32218 + *F. pellucinervis*, *F. crispulus* var. *robinsonii*), 1200 m alt., on soil on cliff, Nov. 23, 1996 (Higuchi 32165 + *F. crispulus* var. *robinsonii*); 2nd Camp - Mt. Vutimena, steep slope, 870 m alt., on soil, Oct. 18, 1997 (Sugimura 1655); Mt. Tabwemasana, 950 m alt., on rock, Nov. 6, 1996 (Higuchi 31514 + *F. gardneri*).

7. *F. lagenarius* Mitt., J. Linn. Soc. Bot. 10: 184 (1868).

Specimens examined. Espiritu Santo Isl., Peavot - Mt. Vutimele, 750 m alt., on tree fern trunk, Nov. 21, 1996 (Higuchi 31997); Mt. Vutimele, 1100 m alt., on tree trunk, Nov. 25, 1996 (Higuchi 32258); Mt. Tabwemasana, 1000 m alt., on trunk of tree fern, Nov. 6, 1996 (Higuchi 31559, 31773, 31858); Butmas, lower montane forest, 520 m alt., on tree trunk, Oct. 23, 1997 (Sugimura 1719), 560 m alt. (Sugimura 1728).

8. *F. lautokensis* Dixon, Proc. Linn. Soc. N. S. Wales 55: 270 (1930).

Specimens examined. Espiritu Santo Isl., Peavot - Mt. Vutimele, 750 m alt., on soil, Nov. 21, 1996 (Higuchi 32000 + *F. pellucidus*); Mt. Tabwemasana, 1000 m alt., on rock, Nov. 8, 1996 (Higuchi 31800).

***9. *F. linearis* Brid. var. *aeruginosus* I.G.Stone, J. Bryol. 16: 404 (1991).**

Syn. *F. aeruginosus* Hook. f. & Wils., Fl. Nov. Zel. 2: 62, 83 f. 5 (1854).

Specimen examined. Espiritu Santo Isl., Peavot, ca. 50 m alt., on rock, Nov. 27, 1996 (Higuchi 32326).

10. *F. linearis* var. *obscurirete* (Broth. & Paris) I.G.Stone, J. Bryol. 16: 404 (1991).

Specimen examined. Espiritu Santo Isl., Mt. Vutimele, 1100 m alt., on rock, Nov. 24, 1996 (Higuchi 32242 + *F. pellucinervis*).

11. *F. maceratus* Mitt., Trans. Proc. Roy. Soc. Victoria 19: 91 (1882).

Specimens examined. Espiritu Santo Isl., Peavot, ca. 50 m alt., on bare soil, Nov. 27, 1996 (Higuchi 32337), on rock (Higuchi 32327, 32345), on soil at seashore (Higuchi 32354); Peavot - Mt. Vutimele, 100 m alt., on soil, Nov. 20, 1996 (Higuchi 31960); 2nd Camp - Mt. Vutimena, steep slope, 540 m alt., on rock, Oct. 18, 1997 (Sugimura 1612); Mt. Tabwemasana, 300 m alt., on soil, Nov. 5, 1996 (Higuchi 31484); Mt. Tabwemasana - Kerepua, 160 m alt., on soil, Nov. 11, 1996 (Higuchi 31934). Efate Isl., Pang Pang, 20 m alt., on soil, Oct. 3, 1997 (Sugimura 1415), on rock (Sugimura 1419).

12. *F. oblongifolius* Hook. f. & Wils. var. *oblongifolius*, London J. Bot. 3: 547 (1844).

Specimen examined. Espiritu Santo Isl., Mt. Tabwemasana, 780 m alt., on rock, Nov. 5, 1996 (Higuchi 31493).

*13. ***F. oblongifolius* var. *hyophilus*** (Mitt.) J.E.Beever & I.G.Stone, New Zealand J. Bot. 36: 84 (1998).

Syn. *F. formosanus* Nog., J. Hattori Bot. Lab. 7: 63 (1952).

Specimen examined. Espiritu Santo Isl., Mt. Tabwemasana, 780 m alt., on tree root, Nov. 5, 1996 (Higuchi 31499).

14. ***F. pellucidus*** Hornsch., Linnaea 15: 146 (1841).

Syn. *F. laxus* Sull. & Lesq., Proc. Am. Ac. Arts Sc. 4: 275 (1859).

Specimens examined. Espiritu Santo Isl., Peavot - Mt. Vutimele, 750 m alt., on soil, Nov. 21, 1996 (Higuchi 3200 + *F. lautokensis*); 2nd Camp - Mt. Vutimena, steep slope, 670 m alt., on soil, Oct. 18, 1997 (Sugimura 1624 + *F. crispulus* var. *robinsonii*), 870 m alt. (Sugimura 1638).

*15. ***F. pellucinervis*** Dixon ex E.B.Bartram, Bishop Mus. Occ. Pap. 19 (11): 220 (1948).

Specimens examined. Espiritu Santo Isl., Mt. Vutimele, 1100 m alt., on rock, Nov. 24, 1996 (Higuchi 32242 + *F. linearis* var. *obscurirete*), on rocky cliff (Higuchi 32218 + *F. hyalinus*, *F. crispulus* var. *robinsonii*).

*16. ***F. rupicola*** Paris & Broth., Oefv. Finsk. Vet. Soc. Foerh. 48: 7 (1906).

Specimen examined. Espiritu Santo Isl., Mt. Tabwemasana, 1000 m alt., on rock (Higuchi 31770).

17. ***F. zollingeri*** Mont., Ann. Sc. Nat. Bot., sér. 3, 4: 114 (1845).

Specimen examined. Espiritu Santo Isl., Peavot, ca. 50 m alt., on bare soil, Nov. 27, 1996 (Higuchi 32336).

Iwatsuki and Suzuki (1995) reported 15 species of *Fissidens* from Vanuatu, based on Dr. M. Higuchi's collections. Consequently, Higuchi (1996) listed 16 species (+ 1 variety) of *Fissidens* for the moss flora of Vanuatu. Among them, report of *F. sylvaticus* by Tixier (1974) from Espiritu Santo Isl. is doubtful. It might be based on misidentification of *F. crispulus*.

In present report, we found 14 species (+ 2 varieties) of *Fissidens* from the area. Among them 7 taxa are new additions to the moss flora of Vanuatu. They are *Fissidens bryoides* Hedw. var. *schmidii* (Müll. Hal.) Chopra & Kumar, *F. ceylonensis* Dozy & Molk., *F. gardneri* Mitt., *F. linearis* Brid. var. *aeruginosus* I. A. Stone, *F. oblongifolius* Hook. var. *hyophilus* (Mitt.) J. E. Beever & I. G. Stone, *F. pellucinervis* Dix. ex Bartr. and *F. rupicola* Par. & Broth.

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Summary

Iwatsuki and Suzuki (1995) reported 15 species of *Fissidens* from Vanuatu, based on Dr. M. Higu-

chi's collections. Later, Higuchi (1996) listed 16 species and 1 variety of *Fissidens*, among which the report of *F. sylvaticus* by Tixier (1974) from Espiritu Santo Island is probably based on the misidentification of *F. crispulus*. In present report there are 14 species and 2 varieties of *Fissidens*, of which 7 are new additions to the moss flora of Vanuatu. These are *Fissidens bryoides* var. *schmidii*, *F. ceylonensis*, *F. gardneri*, *F. linearis* var. *aeruginosus*, *F. oblongifolius* var. *hyophilus*, *F. pellucidus* and *F. rupicola*.

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