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A Contribution to the *Fissidens* (Musci, Fissidentaceae) of New Caledonia. II

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Abstract – Three species, *Fissidens elegans, F. geminiflorus*, and *F. perobtusus,* are reported new to New Caledonia. Records for 13 other species are appended. Seven names have been placed in synonymy. A checklist of 35 species and varieties of *Fissidens* for New Caledonia is presented.

***Fissidens* / Fissidentaceae / Bryopsida / New Caledonia**

Résumé – Trois espèces, *Fissidens elegans, F. geminiflorus*, and *F. perobtusus,* sont nouvelles pour la Nouvelle-Calédonie. Les localités de 13 autres espèces sont ajoutées. 7 noms sont placés en synonymie. Une check-list de 35 espèces et variétés de *Fissidens* de la Nouvelle-Calédonie est présentée.

***Fissidens* / Fissidentaceae / Bryopsida / Nouvelle-Calédonie**

INTRODUCTION

A recent report on collections of *Fissidens* made by the senior author on New Caledonia in September 2001 was made by Müller *et al.* (2003). The present report on *Fissidens* on the island is based on collections made by the senior author in September 2003. Sixteen species and varieties are represented in these collections, among which three are new to the island. Original set of the collections are in DR and duplicates are in PAC.

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SPECIES NEW TO NEW CALEDONIA

Fissidens elegans Brid.

Poya 14 km NE: Grottes d'Adio, limestone massif, on limestone rocks, 200 m, 165° 15' O, 21° 15' S, 6 September 2003, *F. Müller NC457 & NC463*, det. R. Pursell.
Distribution: U.S.A.; Mexico; West Indies; Central and South America; Hawaii; Sri Lanka; New Caledonia.

Fissidens elegans is widespread in subtropical and tropical America. In the more recent literature the species is also cited for Hawaii (Staples *et al.*, 2004) and Sri Lanka (O'Shea, 2002). According to Pursell (1994) there are certainly expressions of this species in Africa that await recognition. *Fissidens linearis* Brid. and its varieties in Asia and Australasia doubtless belong to the *F. elegans*-complex.

Fissidens elegans, a very variable species, is distinguished by its unistratose limbidial cells, small, pluripapillose laminal cells, and a sharp, hyaline cell that usually terminates the leaf apex. The limbidium can be quite variable; it can be expressed on the vaginant laminae of most leaves, or it can be found only on the vaginant laminae of perichaetial leaves. Moreover, the limbidium can be absent from infertile plants. The costa can be percurrent to ending a few cells below the apex.

Fissidens geminiflorus Dozy & Molk.

Cascade de Bâ, 12 km NW of Houaïlou, on wet rocks, 50 m, 165° 03' O, 21° 12' S, 9 September 2003, *F. Müller NC484*, det. R. Pursell.
Distribution: China; Japan; Indonesia; Malaysia; Philippines, Vietnam; Fiji; New Caledonia.

This variable species, found principally in wet or dripping habitats, is characterized by a serrulate leaf margin, a decurrent dorsal lamina, a percurrent taxifolius-type costa, and rather obscure, quadrate-hexagonal, mammillose laminal cells that are 6-12 μm long. Axillary hyaline nodules are sometimes present and the juxtacostal laminal cells can be bistratose.

Fissidens perobtusus Dixon

Bouloupari 20 km W: Plage de Ouano, on soil covered rocks near the coast, 5 m, 165° 49' O, 21° 52' S, 10 September 2003, *F. Müller NC482*, det. F. Müller, conf. R. Pursell.
Distribution: Fiji; Australia (Queensland); New Caledonia.

This rare species is characterized by a rounded leaf apex, costa that ceases below the apex, vaginant laminae about 4/5 the leaf length, a limbidium restricted to the vaginant laminae of perichaetial leaves, and pluripapillose laminal cells.

OTHER SPECIES COLLECTED

Fissidens bogoriensis M. Fleisch. — Sarraméa: along path to Plateau de Dogny, *F. Müller NC447, NC450 p.p.*

Fissidens bryoides Hedw. var. *schmidii* (Müll. Hal.) R. S. Chopra & S. S. Kumar — Poya 15 km NE: Roche d'Adio, *F. Müller NC459, NC461, NC463.*

Fissidens cagoui F. Müll., Pursell & Brugg.-Nann. — Nouméa 30 km N: Mt. Ouin, *F. Müller NC439.*

Fissidens ceylonensis Dozy & Molk. — Sarraméa: along path to Plateau de Dogny, *F. Müller NC450 p. p., NC490.* Sarraméa: Col d'Amieu, *F. Müller NC479.* Houaïlou 12 km NW: Cascade de Bâ, *F. Müller NC486.*

Fissidens compienei Broth. & Paris *in* Broth. — Poya 9 km NE: along street to Grottes d'Adio, *F. Müller NC483.*

Fissidens consociatus Thér. — Hienghène 21 km NW: Cascade de Tao, *F. Müller NC476.*

Fissidens crispulus Brid. — Sarraméa: along path to Plateau de Dogny, *F. Müller NC451.* Koumac 15 km NNE*, F. Müller NC471.* Hienghène 21 km NW: Cascade de Tao, *F. Müller NC475.*

Fissidens curvatus Hornsch. — Sarraméa: along path to Plateau de Dogny, *F. Müller NC443, NC447, NC448, NC449, NC450 p. p.* Pouembout 10 km E: Forêt Plate near Cascade de Ouendé, *F. Müller NC467.*

Fissidens flaccidus Mitt. — Poya 14 km NE: Roche d'Adio, *F. Müller NC465.* Koumac 15 km NNE, *F. Müller NC470.* Bourail: Rocher le Bonhomme, *F. Müller NC487.*

Fissidens oblongifolius Hook. f. & Wilson — Mt. Humboldt, *F. Müller NC432, NC436.* Nouméa 30 km N: Mt. Ouin, *F. Müller NC438, NC441, NC442.* Nouméa 42 km E: Chutes de la Madeleine, *F. Müller NC440.* Nouméa 52 km E: Pic du Grand Kaori, *F. Müller NC444.* Nouméa 58 km E: Cascade Wadiana near Goro, *F. Müller NC485*. Poya 15 km NE: Roche d'Adio, *F. Müller NC468.* Koumac 15 km NNE, *F. Müller NC469*. Sarraméa: along path to Plateau de Dogny, *F. Müller NC445.* Sarraméa: Col d'Amieu, *F. Müller NC479.*

Fissidens pallidus Hook. f. & Wilson — Ouégoa 6 km N: Col d'Amoss, *F. Müller NC472.* Sarraméa: along path to Plateau de Dogny, *F. Müller NC490.*

Fissidens serratus Müll. Hal. var. *serratus* — Sarraméa: Col d'Amieu, *F. Müller NC478.*

Fissidens zollingeri Mont. — Sarraméa: along path to Plateau de Dogny, *F. Müller NC450 p. p.*

A CHECKLIST OF *FISSIDENS* IN NEW CALEDONIA

Pursell & Reese (1982), in a census of the mosses of New Caledonia, listed 50 species and varieties, including nomina nuda, of *Fissidens*. Iwatsuki (1982), by reducing many names to synonymy, recognized 15 species of the genus; he was unable to find specimens for eight of the names. Later, Iwatsuki & Suzuki (1989) increased the representation of the genus on the island to 28 species and varieties, including *Nanobryum thorsbornei* I.G.Stone. Following this work, Müller *et al.* (2003) added three species of *Fissidens* to the flora, including one newly described. The number of species and varieties of *Fissidens* now understood to occur on New Caledonia stands at 35, of which five (14%) are endemic. In the following list, names used by Iwatsuki & Suzuki (1989) are given in parentheses.

Fissidens angustifolius Sull. (*Fissidens dixonianus* E. B. Bartram)

Fissidens becketii Mitt.

Fissidens bogoriensis M. Fleisch.

Fissidens bryoides Hedw. var. ***esquirolii*** (Thér.) Z. Iwats. & Tad. Suzuki

Fissidens bryoides var. ***schmidii*** (Müll. Hal.) R. S. Chopra & S. S. Kumar

Fissidens cagoui F. Müll., Pursell & Brugg.-Nann. – Endemic

Fissidens ceylonensis Dozy & Molk.
Fissidens compienei Broth. & Paris – Endemic
Fissidens consociatus Thér. – Endemic
Fissidens crispulus Brid. var. ***crispulus*** (*Fissidens zippelianus* Dozy & Molk. var. *zippelianus*)
Fissidens crispulus var. ***robinsonii*** (Broth.) Z. Iwats. & Z. H. Li (*Fissidens zippelianus* var. *robinsonii* [Broth.] Z. Iwats. & Tad. Suzuki)
Fissidens curvatus Hornsch. (*Fissidens pungens* Hampe & Müll. Hal.)
Fissidens cuspidiferus Dixon
Fissidens dealbatus Hook. f. & Wilson
Fissidens dietrichiae Müll. Hal. (*Fissidens zollingeri* Mont. var. *major* Besch.)
Fissidens elegans Brid.
Fissidens flabellulus Thwaites & Mitt.
Fissidens flaccidus Mitt. (*F. maceratus* Mitt.)
Fissidens geminiflorus Dozy & Molk.
Fissidens geppii M. Fleisch.
Fissidens hollianus Dozy & Molk.
Fissidens lautokensis Dixon (*Fissidens insularis* Thér., Iwatsuki & Suzuki, 1996, but listed as a synonym of *Fissidens rupicola* Paris & Broth. by Iwatsuki & Suzuki, 1989).
Fissidens oblongifolius Hook. f. & Wilson – Probably the common species on the island.
Fissidens obscurirete Broth. & Paris – Endemic
Fissidens pallidinervis Mitt. (The misapplication of *Fissidens microcladus* Thwaites & Mitt. was discussed by Pursell *et al.*, 2003; the current name, however, is older than *Fissidens minutus* Thwaites & Mitt.).
Fissidens pallidus Hook. f. & Wilson
Fissidens pellucidus Hornsch. (*Fissidens laxus* Sull. & Lesq.)
Fissidens pellucinervis Dixon & E. B. Bartram
Fissidens perobtusus Dixon
Fissidens pseudopallidus I. G. Stone
Fissidens rigidulus Hook. f. & Wilson
Fissidens rupicola Paris & Broth. – Endemic
Fissidens serratus Müll. Hal. var. ***serratus*** (*Fissidens papillosus* Sande Lac.)
Fissidens thorsbornei (I. G. Stone) Brugg.-Nann. (*Nanobryum thorsbornei* I. G. Stone)
Fissidens zollingeri Mont.

NEW SYNONYMY

Fissidens compienei Broth. & Paris *in* Broth., *Oefversigt af Förhandlingar, Finska Vetenskaps-Societeten* 51A(17): 6. 1909.
Fissidens ovalifolius Paris & Broth. *in* Paris, *Troisième liste des mousses*...7. 1909, *nom. nud.*, **syn. nov.** – **Original material**: Nov. Caledon., Paita, Augusto 1908, leg. *Le Rat* s. n. (PC, *0081544*). **Comments**: This collection does not differ from *Fissidens compienei* Broth. & Paris *in* Broth. The sex of this species is apparently

quite variable. Iwatsuki (1982) reported the species as gonioautoicous, but Iwatsuki & Suzuki (1989) stated it was synoicous. The plants in the current collection are rhizautoicous.

Fissidens curvatus Hornsch., *Linnaea* 15: 148. 1841.
Fissidens perangustus Müll. Hal., *Rev. Bryol.* 12: 57. 1887, *nom. nud.,* **syn. nov.,** *nec Fissidens perangustus* Broth., *Proc. Linn. Soc. New South Wales* 41: 577. 1916, *nec Fissidens perangustus* Broth. *in* Bruehl, *Rec. Bot. Surv. India* 13 (1): 123. 1931, *nom. nud*. – **Original material**: T. Savès, Mousses de Nouvelle-Calédonie *20* (S, *B110349*).
Fissidens virentiloma Paris & Broth. *in* Paris, *Troisième liste de mousses*...7. 1909, *nom. nud.*, **syn. nov.** – **Original material**: Nov. Caledon., Col d'Annieu, Augusto 1908, leg. *Marc Buso s.n*. (PC, *0081550, 0081548, 0081551, 0081549* & *0081552*).
Comments: *Fissidens perangustus* Broth., according to Beever & Stone (1999), is restricted to Australia and New Zealand and is not found in New Caledonia as reported by Miller *et al.* (1978).
The collections *0081549* and *0081550* of *F. virentiloma* were determined correctly as *Fissidens francii* Thér. by T. Suzuki in 1986 and as *Fissidens pungens* Hampe & Müll. Hal. by Z. Iwatsuki in 1989. Both names are synonyms of *Fissidens curvatus* Hornsch. Also the remaining three specimens of *F. virentiloma* belong to this species.

Fissidens elegans Brid., *Muscologia Recentiorum Supplementum* 1: 167. 1806.
Fissidens pumicum Paris & Broth. *in* Paris, *Rev. Bryol.* 37: 36. 1910, *nom. nud*., **syn. nov.** – **Original material**: Ins. Pinorum, ad pumices, Majo 1909, leg. *Le Rat* s. n. (PC, *0081545, 0081547* & *0081546*).
Comments: This collection is an unusual expression of *Fissidens elegans* Brid. The plants are pale, the limbidium is weak and is restricted to the vaginant laminae of perichaetial leaves, the costa ends below the leaf apex, and, the papillae on the laminal cells are weak. Otherwise, most leaves end in a clear, sharp cell, the seta is smooth, and the capsules are erect and radially symmetric.

Fissidens pallidinervis Mitt., *Journal of the Linnean Society, Botany* 12: 592. 1869.
Fissidens dumbeanus Thér., *Bull. Acad. Int. Géogr. Bot.* 20: 98. 1910, **syn. nov.** Protologue: Dumbéa, vallée de la Nondoué, sur la terre, en compagnie de *Fissidens subacutissimus* Th. – **Type**: Nouv. Calédonie, Nondoué (Dumbéa), leg. *Franc, s.n*., juin 1908 (en mélange avec *F. subacutissimus* fertile), **(lectotype,** chosen here, S, *B107823*).
Comments : This species does not differ from *Fissidens pallidinervis* Mitt. *Fissidens subacutissimus* was placed in the synonymy of *Fissidens bogoriensis* Fleisch. by Iwatsuki (1982).

Fissidens serratus Müll. Hal. var. ***serratus***, *Botanische Zeitung. Berlin* 5: 804. 1847.
Fissidens le-ratii Broth. & Paris *in* Broth., *Oefvers. Förh. Finska Vetensk.-Soc.* 51A (17): 8. 1909, **syn. nov.** Protologue: Yahoué, ad terram (A. Le Rat). – **Type:** Nov. Caledon., Yahoué, 1906, leg. *Le Rat, s.n.,* (**lectotype**, chosen here, S, *B109780*).
Comments: This species does not differ from *Fissidens serratus* Müll. Hal. var. *serratus*.

Fissidens koghiensis Paris & Broth. *in* Paris, *Troisième liste des mousses*...7. 1909, ***nom. rejicienda,*** – **Original material**: Nov. Caledon., M. Koghi, April 1907, leg. *Le Rat, s. n.* (ex herb. Paris), (PC, *0081543*).
Comments: The collection cited above is a mixture of *Fissidens curvatus* Hornsch. and *Fissidens elegans* Brid.

SPECIES REPORTED FROM NEW CALEDONIA THAT HAVE NOT BEEN STUDIED

Fissidens canalae Broth. & Paris *in* Broth., *Oefers. Förh. Finska Vetensk.-Soc.* 51A (17): 8. 1909.

Fissidens kanakensis Paris & Broth. *in* Paris, *Troisième liste des mousses*...7. 1909, *nom. nud.*

Fissidens mouensis Thér., *Bull. Acad. Int. Géogr. Bot*. 20: 97. 1910.

Fissidens negropoensis Paris & Broth. *in* Paris, *Troisième liste des mousses*...7. 1909, *nom. nud*.

Fissidens siculaefolius Paris & Broth. *in* Paris, *Troisième liste de mousses*…7. 1909, *nom. nud.*

Fissidens uxoris Paris & Broth. *in* Paris, *Troisième liste de mousses*…7. 1909, *nom. nud.*

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