

A contribution to the bryoflora of Pitcairn and Austral Islands groups

Katia CEZÓN^{a*}, Jesús MUÑOZ^a & Naomi KINGSTON^b

^a*Real Jardín Botánico (CSIC), Plaza de Murillo 2, E-28014 Madrid, Spain*

^b*National Parks & Wildlife Service, 7 Ely Place, Dublin 2, Ireland*

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Abstract – We report the mosses collected in two expeditions to Pitcairn Islands and French Polynesia between 1991 and 2001. The list includes 33 mosses. Of special interest are *Ectropothecium venustum*, found in Raivavae Island, and *Macromitrium tahitisekundum*, from Pitcairn Island, which were previously considered endemics to Tahiti.

Austral Islands / French Polynesia / Henderson / Oceanic islands / Oeno / Pitcairn Islands / Raivavae / Rimatara / Rurutu / Tubuai

INTRODUCTION

The bryophyte flora of the islands and atolls of the Pitcairn and Austral groups are basically unknown (Greene & Harrington, 1989). As other island groups in the Pacific Ocean, their bryophyte flora is of Southeastern Asian affinities, although quite depauperate in number of species. Here we present a list of mosses collected in the Pitcairn and Austral island groups during expeditions whose primary aims were to characterize the vegetation and flora (Waldren *et al.*, 1995; Kingston & Waldren, 2003).

The Pitcairn group (Fig. 1) consists of the two atolls of Oeno (1.6 km²) and Ducie (0.7 km², not studied), the raised coral island of Henderson (37 km²), and the high, rocky island of Pitcairn (4.5 km²), all formed by volcanic hotspot activity. Pitcairn Island, with a highest elevation of 347 m, harbours the most diverse vegetation of the group (Kingston & Waldren, 2003), although human induced habitat change has resulted in a reduction in the amount of native forest and significant reduction in the populations of the 81 native species. In addition, over 250 species have been introduced to the island. Henderson has 65 species (Florence *et al.*, 1995) in strands, cliff and inland forest communities on the uplifted makatea, and can be considered unique among the raised coral islands of the Pacific in that its original ecosystems are largely intact. Finally, Oeno harbours a very limited vascular plant flora, of only 18 species (Florence *et al.*, 1995).

The Austral group (Îles Australes/Austral Islands) are a long chain of islands located in the far South Pacific (Fig. 1). They are the remains of former volcanic peaks, surrounded by uplifted limestone reef rims. The vegetation

* Correspondence and reprints: kcezon@rjb.csic.es

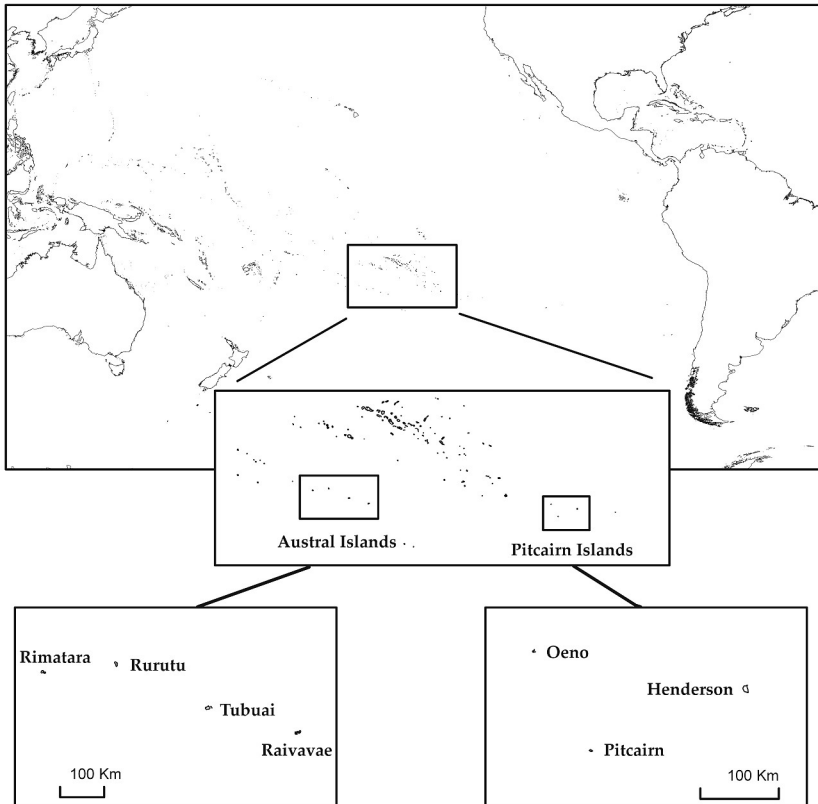


Fig. 1. Map of the study area showing the islands of the Austral (bottom left) and Pitcairn (bottom right) groups mentioned in the text.

includes lowland and montane rain forest, with about 150 species of flowering plants, profoundly altered by human activity (Mueller-Dombois & Fosberg, 1998).

The geographic coordinates for the localities in the catalogue are: Pitcairn Islands: Henderson Island 24° 20' S 128° 20' W; Pitcairn Island 25° 04' S 130° 06' W; Oeno Island 23° 56' S 130° 44' W. French Polynesia: Austral Islands. Rimatara Island 22° 40' S 152° 45' W; Tubuai Island 23° 23' S 149° 27' W; Rurutu Island 22° 25' S 151° 20' W; Raivavae Island 23° 52' S 147° 40' W.

LIST OF SPECIES

Brachymenium indicum (Dozy & Molck.) Bosch & Sande Lac.

On sand and sandstone in open areas. Widespread in Oceania.

Oeno Island: Coconut Cape, *Waldren 91-022* (MA-Musci 27075); Eastside, *Waldren 91-099* (MA-Musci 27076), *Waldren 91-100* (MA-Musci 27077).

Bryum argenteum Hedw.

On bare rocks and eroded slopes; 40-240 m a.s.l. Cosmopolitan.

Pitcairn Island: Long Ridge, *Kingston & Waldren 97-595* (MA-Musci 27072); St. Pauls, *Kingston & Waldren 97-308c* (MA-Musci 27073); Water Valley, *Kingston & Waldren 97-189* (MA-Musci 27074).

Bryum dichotomum Hedw.

On rocks; 100-240 m a.s.l. Cosmopolitan, this species is usually treated as *B. bicolor* Dicks.

Henderson Island: *Waldren 91-059* (MA-Musci 27069). **Pitcairn Island:** Tautama, *Kingston & Bell 97-249* (MA-Musci 27070); Long Ridge, *Kingston & Waldren 97-191* (MA-Musci 27071).

Callicostella papillata (Mont.) Mitt.

On wet rocks; 180 m a.s.l. Widespread in tropical Asia, Malesia and Oceania (Miller & al., 1978).

Pitcairn Island: Browns Water, *Kingston & Waldren 97-330* (MA-Musci 27086).

Calymperes crassinerve (Mitt.) A. Jaeger

On rocks; 30 m a.s.l. Widespread in coastal areas of tropical Asia, Malesia, and Oceania (Eddy, 1990).

Rimatara: Makatea area halfway between Anapoto and Amaru, *Kingston & Bradley A0041* (MA-Musci 27148).

Calymperes graeffeanum Müll. Hal.

On rocks; 10-120 m a.s.l. O'Shea (2001) synonymized *C. aongstroemii* Besch. with this species, which extends its range from the Indian Ocean Islands, NE Australia, to Oceania (Ellis, 1988).

Pitcairn Island: Tautama, *Kingston & Waldren 97-309* (MA-Musci 27118); Water Valley, *Kingston & Waldren 97-269* (MA-Musci 27119); Deep Valley, *Kingston & Waldren 97-594* (MA-Musci 27120). **Raivavae:** South of Mt. Matotea and Rairua village, *Kingston & Bradley A00220* (MA-Musci 27147).

Calymperes tenerum Müll. Hal.

Epiphyte around inundated areas and on dead wood; close to sea level. Pantropical, common in Oceania (Reese, 1993).

Henderson Island: 1.2 km North-south trail, *Waldren 91-107* (MA-Musci 27125); North Beach, *Waldren 91-108* (MA-Musci 27121), *Waldren 91-138* (MA-Musci 27124), *Waldren 91-140* (MA-Musci 27127). **Oeno Island:** Pool area, *Waldren 91-183* (MA-Musci 27122), *Waldren 91-199* (MA-Musci 27126); North-West point, *Waldren 91-165* (MA-Musci 27123). **Rimatara:** Makatea area halfway between Anapoto and Amaru, *Kingston & Bradley A0038a* (MA-Musci 27149). **Tubuai:** 150 m north of Mataura in valley to west of plateau path, *Kingston & Bradley A0049* (MA-Musci 27161).

Calypothecium urvilleanum (Müll. Hal.) Broth.

Epiphyte on *Metrosideros* sp.; 382 m a.s.l. Hyvönen (1989) synonymized *C. crispulum* (Bosch & Sande Lac.) Broth. with *C. urvilleanum*, leaving only one species in the area. Common in SE-Asia, Malesia, and Oceania.

Tubuai: SW crest just before main crest of Mt. Taitaa, *Kingston & Bradley A0053a* (MA-Musci 27141).

Campylopodium medium (Duby) Giese & Frahm

On rocks and eroded slopes; 140-260 m a.s.l. Widespread in the tropics.

Pitcairn Island: Devils Elbow, *Kingston & Waldren 97-162* (MA-Musci 27067), *Kingston & Waldren 97-163* (MA-Musci 27068); The Hollow, *Kingston 97-858* (MA-Musci 27063).

Campylopus laxitextus Sande Lac.

Eroded slopes; 240 m a.s.l. A widespread species in Malesia and Oceania, that has been described as new almost from each collection (cf. Frahm, 1987).

Pitcairn Island: The Hollow, *Kingston 97-857* (MA-Musci 27139).

Campylopus umbellatus (Arn.) Paris

On eroded slopes, large boulders, and rocks in ridgetop grasslands; 40-450 m a.s.l. Widespread in tropical and subtropical Asia extending into Oceania (Eddy, 1988).

Pitcairn Island: Palau, *Waldren 97-278* (MA-Musci 27061). St. Pauls, *Kingston & Waldren 97-308b* (MA-Musci 27062). **Raivavae:** Summit of Mt. Hiro, *Kingston & Bradley A00225* (MA-Musci 29466).

Dicranella hochreutineri Cardot

On bare mud; 100 m a.s.l. Described from Hawaii (Cardot, 1912), it has been previously reported from Tahiti by Whittier (1976). According to Cardot (1912), it is related to the Indo-Malesian *D. coarctata* (Müll. Hal.) Bosch & Sande Lac.

Raivavae: Slopes to the east of Mt. Matotea, *Kingston & Bradley A00150* (MA-Musci 29465).

Ectropothecium venustulum Besch.

Marae in *Cerbera* woodland; 70 m a.s.l. Previously considered endemic to Tahiti. New to Raivavae Island.

Raivavae: track towards Rairua from the south side of the island, *Kingston & Bradley A00221* (MA-Musci 27158).

Fissidens oblongifolius Hook. & Wilson

On rocks, spreading to form mats; 80-140 m a.s.l. Pantropical.

Pitcairn Island: Issacs Valley, *Kingston & Waldren 97-252* (MA-Musci 27060); Water Valley, *Kingston & Waldren 97-268* (MA-Musci 27059).

Garovaglia powelli Mitt.

Epiphyte and on rocks; 382 m a.s.l. Common and widespread throughout SE-Asia, Malesia, N-Australia, and Oceania (During, 1977; Hyvönen, 1989).

Tubuai: SW crest just before main crest of Mt. Taitaa, *Kingston & Bradley A0053* (MA-Musci 27154), *Kingston & Bradley A0056* (MA-Musci 27155).

Hypopterygium tamarisci (Sw.) Brid.

On shaded rocks in gully; 180 m a.s.l. A pantropical species, which according to Kruijier's (2002) detailed treatment, includes all the taxa described from Oceania.

Pitcairn Island: Ginger Valley, *Waldren 97-669* (MA-Musci 27085).

Leucophanes glaucum (Schwägr.) Mitt.

Epiphyte and on rotten wood; sea level - 120 m a.s.l. Widespread throughout SE Asia, Malesia, Australia, and tropical Pacific Islands (Eddy, 1990; Salazar-Allen, 1993).

Henderson Island: 1.2 km North-south trail, *Waldren 91-101* (MA-Musci 27116), *Waldren 91-102* (MA-Musci 27115). **Pitcairn Island:** Faute Valley, *Kingston & Waldren 97-152* (MA-Musci 27117). **Rimatara:** Makatea area halfway between Anapoto and Amaru, *Kingston & Bradley A0037* (MA-Musci 27159). Tubuai: 150m north of Mataura in valley to west of plateau path, *Kingston & Bradley A0050* (MA-Musci 27160).

Macromitrium incurvifolium (Hook. & Grev.) Schawgr.

Epiphyte; 15 m a.s.l. According to Vitt & al. (1995), widespread in the Pacific, from where Whittier (1976) reported from several areas.

Rurutu: Makatea forest south of Teanapapa, *Kingston & Bradley A00111* (MA-Musci 27157). **Tubuai:** North slope of Mt. Haurii, *Kingston & Bradley A0078* (MA-Musci 27156).

Macromitrium tahitsecundum Margad.

Epiphyte; 180-280 m a.s.l. Previously considered endemic from Tahiti, this collection extends its range considerably to the east to Pitcairn Island.

Pitcairn Island: Below Ships Landing Point, *Kingston & Waldren 97-307* (MA-Musci 27083); Below Highest point, *Kingston 97-339* (MA-Musci 27084).

Macromitrium tongense Sull.

Epiphyte. A rare species known from Papua, Henderson Island and Tonga.

Henderson Island: 1 km North-south trail, *Kingston 97- 367* (MA-Musci 27080), *Waldren 91104* (MA-Musci 27082), *Waldren 91-105* (MA-Musci 27078); 1.2 km Pinnacle Trail, *Waldren 91-040* (MA-Musci 27081), *Waldren 91-041* (MA-Musci 27079).

Mitthyridium obtusifolium (Lindb.) H. Rob.

On rocks and also epiphyte; sea level - 280 m a.s.l. According to Eddy (1990), widespread in Malesia and Oceania, although Reese & al. (1986) reported it from Sri Lanka, Andaman Islands and South America.

Pitcairn Island: Below Highest point, *Kingston & Waldren 97-166* (MA-Musci 27137), *Kingston 97-339a* (MA-Musci 27138); Faute Valley, *Kingston & Waldren 97-154* (MA-Musci 27135). **Raivavae:** South of Mt. Matotea and Rairua village, *Kingston & Bradley A00220c* (MA-Musci 27145). **Rimatara:** Makatea area halfway between Anapoto and Amaru, *Kingston & Bradley A0037a* (MA-Musci 27146), *Kingston & Bradley A0039* (MA-Musci 27144).

Neckeropsis lepineana (Mont.) M. Fleisch.

On rocks; 30 m a.s.l. A common species widely distributed throughout the Paleotropics (Enroth, 1989).

Rimatara: Makatea area halfway between Anapoto and Amaru, *Kingston & Bradley A0040* (MA-Musci 27150).

Papillaria crocea (Hampe) A. Jaeger

On basaltic rocks; 382 m a.s.l. Common in SE-Asia, Malesia, and Pacific Ocean islands (Streimann, 1992).

Tubuai: North slope of Mt. Haurii, *Kingston & Bradley A0079* (MA-Musci 27152). SW crest just before main crest of Mt. Taitaa, *Kingston & Bradley A0054* (MA-Musci 27153).

Philonotis runcinata Angstr.

On wet rocks in streams; 80-200 m a.s.l. According to Koponen & Norris (1996), it could be widely distributed throughout the Pacific Ocean area.

Pitcairn Island: Deep Valley, *Kingston & Waldren 97-592* (MA-Musci 27133); Johnny Toonina, *Kingston & Waldren 97-187* (MA-Musci 27134); Palau, *Waldren 97-277* (MA-Musci 27132).

Racopilum pacificum Besch.

Epiphyte and on rocks; sea level - 80 m a.s.l. Whittier (1976) considered *R. pacificum* distinct from *R. cuspidigerum* (Schwagr.) Mitt., although he noted that Dixon & Greenwood (1930) and Bartram (1933) pointed out that both could represent the same species.

Henderson Island: 1.2 km North-south trail, *Waldren 91-103* (MA-Musci 27131); Pinnacle Trail, *Waldren 91-046* (MA-Musci 27128). **Pitcairn Island:** Johnny Toonina, *Kingston & Waldren 97-190* (MA-Musci 27129); Water Valley, *Kingston & Waldren 97-270* (MA-Musci 27130). **Raivavae:** South of Mt. Matotea and Rairua village, *Kingston & Bradley A00220a* (MA-Musci 27140).

Syrrhopodon involutus Schwägr.

Epiphyte; 7- 23 m a.s.l. Common and widespread in the paleotropics, from East tropical Africa to Malesia, northern Australia, and Oceania.

Rimatara: Makatea area halfway between Anapoto and Amaru, *Kingston & Bradley A0036* (MA-Musci 27142), *Kingston & Bradley A0038* (MA-Musci 27143).

Taxithelium vernieri (Duby) Besch.

Epiphyte on *Pisonia* sp. in embayment forest, and on dead wood. Widespread throughout SE Asia, Malesia, and Oceania.

Henderson Island: North Beach, *Waldren 97-368* (MA-Musci 27089). **Tubuai:** 150 m north of Mataura in valley to west of plateau path, *Kingston & Bradley A0048* (MA-Musci 27151).

Tortella humilis (Hedw.) Jenn.

On damp rock; 200 m a.s.l. An almost cosmopolitan species known from America, Europe, Asia, Africa, and Pacific Islands (Eckel, 1998).

Pitcairn Island: Johnny Toonina, *Kingston & Waldren 97-188* (MA-Musci 27058).

Trematodon longicollis Michx.

Bare eroded slopes and rocks; 40-100 m a.s.l. A pantropical and subtropical species found typically in disturbed areas (Eddy, 1988).

Pitcairn Island: Hill of Difficulty, *Kingston & Waldren 97-856* (MA-Musci 27066); St. Pauls, *Kingston & Waldren 97-308* (MA-Musci 27065); Tautama, *Kingston & D. Bell 97-250* (MA-Musci 27064).

Vesicularia inflectens (Brid.) Müll. Hal.

On stream sides and cliff bases beside the sea; 100-120 m a.s.l. A common species throughout SE-Asia and Oceania.

Pitcairn Island: Deep Valley, *Kingston & Waldren 97-593* (MA-Musci 27088); Tautama, *Kingston & Bell 97-248* (MA-Musci 27087).

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