

Bryophytes of the Northern Mariana Islands, Micronesia II. Acrocarpous Mosses

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Abstract Thirty-two species in 17 genera and 8 families of acrocarpous mosses are enumerated based on the collection from the northern Mariana Islands. Localities, specimens examined, habitat and associated species are provided for each species.

Key words: Acrocarpous mosses, northern Mariana Islands.

The biological expedition to the northern Mariana Islands was conducted by the Natural History Museum and Institute, Chiba, in cooperation with the Department of Natural Resources (Commonwealth of the Northern Mariana Island) and the University of Guam Marine Laboratory between 10 May and 10 June 1992. As a member of the group, T. Furuki collected bryophytes during the expedition. In the present paper acrocarpous mosses are treated.

Study Sites

The party visited nine of the islands: Uracas, Maug, Asuncion, Agrihan, Pagan, Alamagan, Guguan, Sarigan and Anatahan, and stayed at each island between one and six days. The sites studied are located along route a to t as shown in Furuki (1994, fig. 1).

Enumeration of Species

The arrangement of families follows Iwatsuki (1991). Each species name is followed by the localities, which are arranged from north to south, habitat, specimen number(s) and associated species. A complete set of specimens is deposited in the herbarium of the Natural History Museum and Institute, Chiba (CBM).

Family Polytrichaceae (by Yamaguchi)

1. *Pogonatum neesii* (C. Muell.) Dozy

ALAMAGAN: route m, 700 m alt., on soil,

Furuki 10959 (CBM-BB-11396), with *Campylopodium medium*.

Family Fissidentaceae (by Iwatsuki)

2. *Fissidens hollianus* Dozy et Molk.

AGRIHAN: route f, 125 m alt., on soil, Furuki 10684 (CBM-BB-11122); route g, 375 m alt., on soil, Furuki 10739 (CBM-BB-11177). ANATAHAN: route q, 100 m alt., on rocks, Furuki 10344 (CBM-BB-10782).

3. *Fissidens pseudohollianus* Iwats. et Suzuki

AGRIHAN: route f, 300 m alt., on rocks, Furuki 10815 (CBM-BB-11253).

4. *Fissidens zippelianus* Dozy et Molk.

PAGAN: route l, 110 m alt., on rocks, Furuki 10641 (CBM-BB-11079) and 10671 (CBM-BB-11109). ALAMAGAN: route n, 350 m alt., on soil, Furuki 10577 (CBM-BB-11015). ANATAHAN: route s, 20 m alt., on soil, Furuki 10353 (CBM-BB-10791).

5. *Fissidens zollingeri* Mont.

AGRIHAN: route f, 100 m alt., on soil, Furuki 10677 (CBM-BB-11115). PAGAN: route k, 5 m alt., on soil, Furuki 10610 (CBM-BB-11048). ALAMAGAN: route n, 75 m alt., on soil, Furuki 10538 (CBM-BB-10976). GUGUAN: route o, 30 m alt., on rocks, Furuki 10514 (CBM-BB-10952). ANATAHAN: route q, 200 m alt., on boulder, Furuki 10290 (CBM-BB-10728).

Family Dicranaceae (by Yamaguchi)

6. *Campylopodium medium* (Duby) Giese et Frahm

ASUNCION: route e, 550 m alt., on soil, Furuki 10835 (CBM-BB-11273). ALAMAGAN: route m, 700 m alt., on soil, Furuki 10953 (CBM-BB-11390); 700 m alt., on soil, Furuki 10959 (CBM-BB-11396), with *Pogonatum neesii*.

7. *Campylopus umbellatus* (Arn.) Par.

ASUNCION: route e, 450 m alt., on soil, Furuki 10831 (CBM-BB-11269), with *Philonotis nitida*; 450 m alt., on soil, Furuki 10832 (CBM-BB-11270); 500 m alt., on soil, Furuki 10833 (CBM-BB-11271), with *Philonotis nitida*; 600 m alt., on soil, Furuki 10837a (CBM-BB-11275); 600 m alt., on soil, Furuki 10838 (CBM-BB-11276); 700 m alt., on soil, Furuki 10848 (CBM-BB-11285); 700 m alt., on soil, Furuki 10849b (CBM-BB-11509), with *Philonotis nitida*; 850 m alt., on soil, Furuki 10854 (CBM-BB-11292), with *Philonotis nitida*. ALAMAGAN: route m, 575 m alt., on soil, Furuki 10935 (CBM-BB-11372); 700 m alt., on soil, Furuki 10954 (CBM-BB-11391), with *Philonotis nitida*; 700 m alt., on soil, Furuki 10971 (CBM-BB-11405); 700 m alt., on soil, Furuki 10972 (CBM-BB-11406). SARIGAN: route p, 200 m alt., on rocks, Furuki 10446 (CBM-BB-10884); 250 m alt., on rocks, Furuki 10448 (CBM-BB-10886).

8. *Trematodon longicollis* Michx.

PAGAN: route k, 5 m alt., on soil, Furuki 10609 (CBM-BB-11047); 40 m alt., on soil, Furuki 10619 (CBM-BB-11057). ALAMAGAN: route n, 150 m alt., on soil, Furuki 10545 (CBM-BB-10983).

Family Leucobryaceae (by Yamaguchi)

9. *Leucophanes glaucum* (Schwaegr.) Mitt.

AGRIHAN: route g, 50 m alt., on trunk of tree, Furuki 10723 (CBM-BB-11161), with *Calymperes cougiense*. PAGAN: route l, 150 m alt., on root of tree-fern, Furuki 10651 (CBM-BB-11089), with *Calymperes cougiense*. SARIGAN: route p, 150 m alt., on trunk of palm tree, Furuki 10440 (CBM-BB-10878). ANATAHAN: route q, 100 m alt., on trunk of tree, Furuki 10350 (CBM-BB-10788); route t, 350 m alt., on trunk of tree, Furuki 10395 (CBM-BB-10833), with *Calymperes cougiense* and *Syrrhopodon in-*

volutus; 350 m alt., on trunk of tree, Furuki 10398 (CBM-BB-10837), with *Calymperes cougiense* and *Syrrhopodon involutus*; 350 m alt., Furuki 10399 (CBM-BB-10836).

10. *Leucophanes octoblepharioides* Brid.

AGRIHAN: route f, 550 m alt., on trunk of tree, Furuki 10777 (CBM-BB-11215), with *Mitthyridium fasciculatum*; route g, 350 m alt., on root of tree-fern, Furuki 10738 (CBM-BB-11176). SARIGAN: route p, 350 m alt., on trunk of tree, Furuki 10484 (CBM-BB-10922). ANATAHAN: route q, 100 m alt., on trunk of palm tree, Furuki 10343b (CBM-BB-10770); route t, 350 m alt., on root of tree fern, Furuki 10377 (CBM-BB-10815), with *Calymperes porrectum*.

Family Calymperaceae (by Yamaguchi)

11. *Calymperes afzelii* Sw.

AGRIHAN: route g, 250 m alt., on trunk of tree, Furuki 10745 (CBM-BB-11183); 200 m alt., on trunk of palm tree, Furuki 10756 (CBM-BB-11194). SARIGAN: route p, 350 m alt., on trunk of tree, Furuki 10478 (CBM-BB-10916), with *Calymperes tenerum*. ANATAHAN: route s, 35 m alt., on trunk of tree, Furuki 10362 (CBM-BB-10800).

12. *Calymperes boulayi* Besch.

ASUNCION: route e, 200 m alt., on rock-cliff, Furuki 10830 (CBM-BB-11268).

13. *Calymperes cougiense* Besch.

AGRIHAN: route g, 50 m alt., on trunk of palm tree, Furuki 10723 (CBM-BB-11161), with *Leucophanes glaucum*. PAGAN: route l, 150 m alt., on root of tree-fern, Furuki 10651 (CBM-BB-11089), with *Leucophanes glaucum*. ANATAHAN: route t, 350 m alt., on trunk of tree, Furuki 10379 (CBM-BB-10817); 350 m alt., on trunk of tree, Furuki 10395 (CBM-BB-10833), with *Leucophanes glaucum* and *Syrrhopodon involutus*; 350 m alt., on trunk of tree, Furuki 10398 (CBM-BB-10837), with *Leucophanes glaucum* and *Syrrhopodon involutus*.

14. *Calymperes graeffeanum* C. Muell.

ASUNCION: route e, 15 m alt., on rocks, Furuki 10625 (CBM-BB-11063). AGRIHAN: route f, 30 m alt., on rocks, Furuki 10719 (CBM-BB-11157). PAGAN: route l, 15 m alt., on rocks, Furuki 10625 (CBM-BB-11063); 175 m alt., Furuki 10670b (CBM-BB-11505), with *Brachymerium indicum* and *Calymperes strictifolium*.

SARIGAN: route p, 350 m alt., on rocks, Furuki 10457 (CBM-BB-10895), with *Calymperes tenerum*.

15. *Calymperes moluccense* Schwaegr.

Pagan: route l, 200 m alt., on trunk of tree, Furuki 10666 (CBM-BB-11104).

16. *Calymperes porrectum* Mitt.

ANATAHAN: route t, 350 m alt., on root of tree-fern, Furuki 10377 (CBM-BB-10815), with *Leucophanes octoblepharioides*.

17. *Calymperes strictifolium* (Mitt.) Roth

PAGAN: route l, 50 m alt., on rocks, Furuki 10635 (CBM-BB-11073); 175 m alt., on rocks, Furuki 10670b (CBM-BB-11505), with *Brachymenium indicum* and *Calymperes graeffeanum*. ALAMAGAN: 175 m alt., route n, on soil, Furuki 10543 (CBM-BB-10981); 400 m alt., on boulder, Furuki 10605 (CBM-BB-11043). ANATAHAN: route t, 20 m alt., on rocks, Furuki 10357 (CBM-BB-10795), with *Hyophila involuta*; 60 m alt., on rocks, Furuki 10367 (CBM-BB-10805).

18. *Calymperes tenerum* C. Muell.

MAUG E: route b, 150 m alt., on rocks, Furuki 10858 (CBM-BB-11296); 150 m alt., on trunk of palm tree, Furuki 10875 (CBM-BB-11312). MAUG W: route d, 50 m alt., on soil, Furuki 10869 (CBM-BB-11306). ASUNCION: route e, 20 m alt., on trunk of tree, Furuki 10886 (CBM-BB-11323). AGRIHAN: route f, 20 m alt., on trunk of tree, Furuki 10673 (CBM-BB-11111); 100 m alt., on trunk of tree, Furuki 10678b (CBM-BB-11506), with *Meiothecium microcarpum*; 125 m alt., on trunk of tree, Furuki 10703 (CBM-BB-11141). PAGAN: route k, 15 m alt., on trunk of palm tree, Furuki 10613 (CBM-BB-11051); 30 m alt., on trunk of tree, Furuki 10617 (CBM-BB-11055); 50 m alt., on trunk of tree, Furuki 10622 (CBM-BB-11060). ALAMAGAN: route n, 60 m alt., on trunk of palm tree, Furuki 10537 (CBM-BB-10975). GUGUAN: route o, 20 m alt., on standing dead tree, Furuki 10506 (CBM-BB-10944); 220 m alt., on trunk of tree, Furuki 10532 (CBM-BB-10970). SARIGAN: route p, 50 m alt., on rocks, Furuki 10424 (CBM-BB-10862); 100 m alt., on trunk of tree, Furuki 10431 (CBM-BB-10869); 125 m alt., on boulder, Furuki 10434a (CBM-BB-10872); 350 m alt., on trunk of tree, Furuki 10457 (CBM-BB-10895), with *Calymperes graeffeanum*; 350 m

alt., on trunk of tree, Furuki 10478 (CBM-BB-10916), with *Calymperes afzelii*. ANATAHAN: route q, 100 m alt., on trunk of palm tree, Furuki 10352 (CBM-BB-10790).

19. *Exostratum blumei* (Nees ex Hampe) L. T. Ellis

ALAMAGAN: route n, 410 m alt., on rocks, Furuki 10596 (CBM-BB-11034); 450 m alt., on soil, Furuki 10600 (CBM-BB-11038).

20. *Mitthyridium fasciculatum* (Hook. et Grev.) Robinson

AGRIHAN: route f, 550 m alt., on trunk of tree, Furuki 10777 (CBM-BB-11215), with *Leucophanes octoblepharioides*. ALAMAGAN: route m, 550 m alt., on trunk of tree, Furuki 10929 (CBM-BB-11366).

21. *Syrrhopodon involutus* Schwaegr.

ANATAHAN: route t, 350 m alt., on trunk of tree, Furuki 10395 (CBM-BB-10833), with *Calymperes cougiense* and *Leucophanes glaucum*; 350 m alt., on trunk of tree, Furuki 10398 (CBM-BB-10837), with *Calymperes cougiense* and *Leucophanes glaucum*.

22. *Syrrhopodon trachyphyllus* Mont.

ALAMAGAN: route n, 400 m alt., on soil covering rocks, Furuki 10595 (CBM-BB-11033).

Family Pottiaceae (by Yamaguchi)

23. *Barbula indica* (Hook.) Spreng.

MAUG E: route b, 150 m alt., on rock-cliff, Furuki 10859 (CBM-BB-11297), with *Philonotis thwaitesii* and *Weissia controversa*. AGRIHAN: route f, 10 m alt., on rocks, Furuki 10721 (CBM-BB-11159), with *Physcopitrium* sp. ALAMAGAN: route n, 50 m alt., on soil, Furuki 10534 (CBM-BB-10972), with *Bryum apiculatum*; 350 m alt., on rocks, Furuki 10578 (CBM-BB-11016), with *Bryum apiculatum* and *Hyophila involuta*.

24. *Hyophila involuta* (Hook.) Jaeg.

PAGAN: route k, 30 m alt., on soil, Furuki 10614 (CBM-BB-11052); route l, 25 m alt., on rocks, Furuki 10628 (CBM-BB-11066). ALAMAGAN: route n, 350 m alt., on rocks, Furuki 10578 (CBM-BB-11016), with *Barbula indica* and *Bryum apiculatum*; 360 m alt., on trunk of tree, Furuki 10584 (CBM-BB-11022), with *Calliostella prabaktiana*. ANATAHAN: route t, 20 m alt., on rocks, Furuki 10357 (CBM-BB-10795), with *Calymperes strictifolium*.

25. *Weissia controversa* Hedw.

MAUG E: route b, 150 m alt., on rock-cliff, Furuki 10859 (CBM-BB-11297), with *Barbula indica* and *Philonotis thwaitesii*; 150 m alt., on rock-cliff, Furuki 10860 (CBM-BB-11298), with *Brachymerium indicum* and *Bryum apiculatum*.

Family Funariaceae (by Yamaguchi)

26. *Physcomitrium* sp.

AGRIHAN: route f, 10 m alt., on rocks, Furuki 10721 (CBM-BB-11159), with *Barbula indica*.

Family Bryaceae (by Yamaguchi)

27. *Brachymerium exile* (Dozy et Molk.) Bosch et Lac.

URACAS: route a, 40 m alt., on rocks, Furuki 10883 (CBM-BB-11320); 40 m alt., on rocks, Furuki 10884 (CBM-BB-11321). PAGAN: route k, 10 m alt., on rocks, Furuki 10612 (CBM-BB-11050).

28. *Brachymerium indicum* (Dozy et Molk.) Bosch et Lac.

MAUG E: route b, 150 m alt., on rock-cliff, Furuki 10860 (CBM-BB-11298), with *Bryum argenteum* and *Weissia controversa*. PAGAN: route l, 175 m alt., on rocks, Furuki 10670b (CBM-BB-11505), with *Calymperes graeffeanum* and *C. strictifolium*. ALAMAGAN: route n, 350 m alt., on rocks, Furuki 10579 (CBM-BB-11017), with *Bryum apiculatum*.

29. *Bryum apiculatum* Schwaegr.

ALAMAGAN: route n, 50 m alt., on soil, Furuki 10534 (CBM-BB-10972), with *Barbula indica*; 350 m alt., on rocks, Furuki 10578 (CBM-BB-11016), with *Barbula indica* and *Hyophila involuta*; 350 m alt., on rocks, Furuki

10579 (CBM-BB-11017), with *Brachymerium indicum*.

30. *Bryum argenteum* Hedw.

MAUG E: route b, 150 m alt., on rock-cliff, Furuki 10860 (CBM-BB-11298), with *Brachymerium indicum* and *Weissia controversa*.

Family Bartramiaceae (by Yamaguchi)

31. *Philonotis nitida* Mitt.

ASUNCION: route e, 450 m alt., on soil, Furuki 10831 (CBM-BB-10795), with *Calymperes strictifolium* and *Hyophila involuta*; 500 m alt., on soil, Furuki 10833 (CBM-BB-11271), with *Campylopus umbellatus*; 700 m alt., on soil, Furuki 10849b (CBM-BB-11509), with *Campylopus umbellatus*; 850 m alt., on soil, Furuki 10854 (CBM-BB-11292), with *Campylopus umbellatus*. ALAMAGAN: route m, 700 m alt., on soil, Furuki 10954 (CBM-BB-11391), with *Campylopus umbellatus*.

32. *Philonotis thwaitesii* Mitt.

MAUG E: route b, 150 m alt., on rock-cliff, Furuki 10859 (CBM-BB-11297), with *Barbula indica* and *Weissia controversa*. SARIGAN: route p, 250 m alt., on rocks, Furuki 10447 (CBM-BB-10885).

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