

## A List of Pteridophytes Herbarium Specimens<sup>1</sup> (without Hymenophyllaceae) from Vanuatu, Collected in 2000 and 2001

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### ADIANTACEAE<sup>4</sup>

#### *Adiantum aneitense* Carruth. ex Seem.

ESPIRITU SANTO. North ridge of Mt. Tabwemasana, 1800 m alt., 1, Nov. 2000 (Iwashina 00-71). Between 1st Camp and 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°43'E, 970 m alt., 20, Oct. 2001 (Matsumoto 01-654). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600-1350 m alt., 23, Oct. 2001 (Matsumoto 01-768). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 800-600 m alt., 25, Oct. 2001 (Matsumoto 01-808).

#### *Adiantum diaphanum* Blume

ANATOM. Between Anelghowhat and Mt. Ukaeperek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-952 and 01-956).

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 21, Oct. 2001 (Matsumoto 01-668).

#### *Adiantum malesianum* Ghatak

ESPIRITU SANTO. Between 1st Camp and 2nd Camp, Mt. Tabwemasana range, 15°20'S, 166°43'E, 290-800 m alt., 20, Oct. 2000 (Sugimura 00-1011).

#### *Adiantum hispidulum* Sw. -*Adiantum pubescens* Schkuhr auct. Matsumoto *et al.* (1998)

ESPIRITU SANTO. Between 2nd Camp and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°43'E, 700-1115 m alt., 2, Nov. 2000 (Sugimura 00-1150). Between 1st Camp and 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°43'E, 750 m alt., 20, Oct. 2001 (Matsumoto 01-642). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 800-600 m alt., 25, Oct. 2001 (Matsumoto 01-807).

### ANGIOPTERIDACEAE

#### *Angiopteris evecta* (G. Forst.) Hoffm.

ANATOM. Between Anelghowhat and Mt. Ukaeperek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-940).

ESPIRITU SANTO. Butmas, 15°21'S, 166°58'E, 550 m alt., 28, Oct. 2001 (Matsumoto 01-837).

<sup>1</sup>All the specimens are conserved in TNS, and the duplicates will be sent to PVNH.

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<sup>4</sup>Concept of the families used the system of Pichi-Sermolli (1977).

## ASPLENIACEAE

*Asplenium amboinense* Willd.

ANATOM. Near top of Mt. Ukapaerek, 800 m alt., 5, Nov. 2001 (Iwashina 01-20). Mt. Ukapaerek, 600 m alt., 5, Nov. 2001 (Iwashina 01-36 and 01-40). Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-967 and 01-968).

*Asplenium australasicum* Hook.

ESPIRITU SANTO. Between 1st Camp and 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°43'E, 800 m alt., 20, Oct. 2001 (Matsumoto 01-647). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 21, Oct. 2001 (Matsumoto 01-664). Vatthe Conservation Area, near Matantas, 15°10'S, 166°57'E, 50 m alt., 29, Oct. 2001 (Matsumoto 01-854).

*Asplenium bipinnatifidum* Baker -*A. oceanicum* C. Chr.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-944).

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-26). West of Naranga, 280 m alt., 8, Nov. 2000 (Iwashina 00-108). Butmas, in lowland forest, 15°22'S, 167°00'E, 500-530 m alt., 24, Oct. 2000 (Sugimura 00-1027). Between 2nd Camp and top of Mt. Tabwemasana, 15°21'S, 166°44'E, 1120 m alt., 1, Nov. 2000 (Sugimura 00-1210). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 22, Oct. 2001 (Matsumoto 01-700). Butmas, 15°21'S, 166°58'E, 550 m alt., 28, Oct. 2001 (Matsumoto 01-825).

*Asplenium contiguum* Kaulf.

ESPIRITU SANTO. North ridge of Mt. Tabwemasana, 1700 m alt., 1, Nov. 2000 (Iwashina 00-64). Ibid., 1750 m alt., 1, Nov. 2000 (Iwashina 00-65). Ibid., 1800 m alt., 1, Nov. 2000 (Iwashina 00-73). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600-1800 m alt., 23, Oct. 2001 (Matsumoto 01-720).

*Asplenium cuneatum* Lam.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-957).

EFATE. Forari Demonstration Forest Area, east Efate, 300 m alt., 14, Nov. 2000 (Iwashina 00-113).

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-32 and 00-53). Between 1st Camp and 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°43'E, 970 m alt., 20, Oct. 2001 (Matsumoto 01-651 and 01-657). Ibid., 1000-1070 m alt., 21, Oct. 2001 (Matsumoto 01-672, 01-673, 01-706 and 01-707).

*Asplenium cuneatum* × *laserpitiifolium*

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 21, Oct. 2001 (Matsumoto 01-671).

Note: Intermediate between *A. cuneatum* and *A. laserpitiifolium*, having sterile spores and immature sporangia.

*Asplenium gibberosum* (G. Forst.) Mett. -*Loxoscapha brachycarpa* (Mett.) Kuhn auct. Matsumoto *et al.* (1998)

ANATOM. Mt. Ukapaerek, 700 m alt., 5, Nov. 2001 (Iwashina 01-27). Ibid., 600 m alt., 5, Nov.

2001 (Iwashina 01-37).

ESPIRITU SANTO. Butmas, 500 m alt., 24, Oct. 2000 (Iwashina 00-5). Near top of Mt. Ukapaerek, 800 m alt., 5, Nov. 2001 (Iwashina 01-22). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 1070-1000 m alt., 25, Oct. 2001 (Matsumoto 01-789).

TANNA. Top of Mt. Loanialu, 19°30'S, 169°23'E, 540 m alt., 8, Nov. 2001 (Iwashina 01-59).

*Asplenium horridum* Kaulf.

ANATOM. Mt. Ukapaerek, 600 m alt., 5, Nov. 2001 (Iwashina 01-38). Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-965).

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-43). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 21, Oct. 2001 (Matsumoto 01-675).

*Asplenium insiticium* Brack. -*A. lobulatum* Mett.

ESPIRITU SANTO. North ridge of Mt. Tabwemasana, 1800 m alt., 1, Nov. 2000 (Iwashina 00-74). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600-1350 m alt., 23, Oct. 2001 (Matsumoto 01-745, 01-746, 01-755, 01-757 and 01-759).

*Asplenium laserpitifolium* Lam.

EFATE. Forari Demonstration Forest Area, east Efate, 300 m alt., 14, Nov. 2000 (Iwashina 00-115).

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 150 m alt., 31, Oct. 2000 (Iwashina 00-48). Between Matantas and Butmas, 300 m alt., 7, Nov. 2000 (Iwashina 00-102). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 21, Oct. 2001 (Matsumoto 01-674, 01-689 and 01-709). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 1070-1000 m alt., 25, Oct. 2001 (Matsumoto 01-792).

*Asplenium marattioides* (Brack.) C. Chr.

ESPIRITU SANTO. Butmas, 15°21'S, 166°58'E, 550 m alt., 28, Oct. 2001 (Matsumoto 01-826).

*Asplenium nidus* L.

ESPIRITU SANTO. Butmas, 15°21'S, 166°58'E, 550 m alt., 28, Oct. 2001 (Matsumoto 01-836).

*Asplenium polyodon* G. Forst. *sensu lato*

**Mountain type:** ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-46). Between 1st Camp and 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°43'E, 970 m alt., 20, Oct. 2001 (Matsumoto 01-650). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 21, Oct. 2001 (Matsumoto 01-662, 01-666 and 01-701). *Ibid.*, 1600-1350 m alt., 23, Oct. 2001 (Matsumoto 01-764).

**Sea shore type:** IRIRIKI. Near Port Vila, on dried calcareous rock wall, 5-10 m alt., 12, Oct. 2001 (Matsumoto 01-601).

*Asplenium subflexuosum* Rosenst.

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600-1800 m alt., 23, Oct. 2001 (Matsumoto 01-722).

*Asplenium (Hymenasplenium) excisum* C. Presl

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-51). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt.,

22, Oct. 2001 (Matsumoto 01-703).

***Asplenium (Hymenasplenium) subnormale*** Copel.

ESPIRITU SANTO. Santo Forest Research Station, 15°15'S, 167°06'E, 150 m alt., 30, Oct. 2001 (Matsumoto 01-862 and 01-870).

***Asplenium (Hymenasplenium) unilaterale*** Lam. *sensu lato* (Terrestrial type)

ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 1070-1000 m alt., 25, Oct. 2001 (Matsumoto 01-794).

***Asplenium (Hymenasplenium) unilaterale*** Lam. *sensu lato* (Rheophyte type)

ESPIRITU SANTO. Santo Forest Research Station, 15°15'S, 167°06'E, 150 m alt., 30, Oct. 2001 (Matsumoto 01-872).

***Asplenium (Hymenasplenium) unilaterale*** Lam. *sensu lato* (Submerged type)

ESPIRITU SANTO. Santo Forest Research Station, 15°15'S, 167°06'E, 150 m alt., 30, Oct. 2001 (Matsumoto 01-874).

Note: Budding from several parts of frond, rhizome and root. There are also some ribbon-like gametophytes in the rhizome-root system. Kato and Iwatsuki (1985) reported this form from Seram Island, the Moluccas, Indonesia as aquatic ecotype of *Asplenium unilaterale s. l.* in water spring "Air Mata Makariki". Then, this is second report and new to Melanesian region.

#### ATHYRIACEAE

***Deparia boryana*** (Willd.) M. Kato

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 22, Oct. 2001 (Matsumoto 01-702).

***Deparia petersenii*** (Kunze) M. Kato

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-953).

***Diplaziopsis javanica*** (Blume) C. Chr.

ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 1070-1200 m alt., 25, Oct. 2001 (Matsumoto 01-783).

***Diplazium accedens*** Blume

ESPIRITU SANTO. Vatthe Conservation Area, near Matantas, 50 m alt., 6, Nov. 2000 (Iwashina 00-85). Ibid., 15°10'S, 166°57'E, 50 m alt., 29, Oct. 2001 (Matsumoto 01-850).

***Diplazium bulbiferum*** Brack.

ESPIRITU SANTO. Vatthe Conservation Area, near Matantas, 50 m alt., 6, Nov. 2000 (Iwashina 00-80). Ibid., 15°10'S, 166°57'E, 50 m alt., 29, Oct. 2001 (Matsumoto 01-846).

***Diplazium dilatatum*** Blume

EFATE. Forari Demonstration Forest Area, east Efate, 300 m alt., 14, Nov. 2000 (Iwashina 00-116).

ESPIRITU SANTO. West of Naranga, 280 m alt., 8, Nov. 2000 (Iwashina 00-107).

***Diplazium echinatum*** C. Chr.

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-49). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 21, Oct. 2001 (Matsumoto 01-686).

*Diplazium harpeodes* T. Moore

EFATE. Mele Maat Fall, north of Port Vila, 80 m alt., 11, Nov. 2000 (Iwashina 00-110). *Ibid.*, 3, Nov. 2001 (Matsumoto 01-884).

ESPIRITU SANTO. Vatthe Conservation Area, near Matantas, 50 m alt., 6, Nov. 2000 (Iwashina 00-89).

*Diplazium melanocauron* Brack.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-938).

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-22). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 1070-1000 m alt., 25, Oct. 2001 (Matsumoto 01-793). Vatthe Conservation Area, near Matantas, 15°10'S, 166°57'E, 50 m alt., 29, Oct. 2001 (Matsumoto 01-849). Santo Forest Research Station, 15°15'S, 167°06'E, 150 m alt., 30, Oct. 2001 (Matsumoto 01-868).

TANNA. Top of Mt. Loanialu, 19°30'S, 169°23'E, 540 m alt., 8, Nov. 2001 (Iwashina 01-54).

*Diplazium oblongifolium* (Hook.) Jermy

ESPIRITU SANTO. Between 2nd Camp and top of Mt. Tabwemasana, on the north ridge of Mt. Tabwemasana, 15°22'S, 166°44'E, 1500 m alt., 1, Nov. 2000 (Sugimura 00-1203).

*Diplazium pallidum* (Blume) T. Moore

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-966).

Note. New to Vanuatu (Malaya, Java, Borneo and Queensland of Australia).

*Diplazium proliferum* (Lam.) Thouars

ANATOM. Along Inwa Lelchei River, foot of Mt. Nidwon Nelcau, 20°13'S, 169°49'E, 50-200 m alt., 6, Nov. 2001 (Matsumoto 01-986).

## BLECHNACEAE

*Blechnum gibbum* (Labill.) Mett.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170-180 m alt., 5, Nov. 2001 (Matsumoto 01-897).

*Blechnum milnei* (Carruth.) C. Chr.

TANNA. Top of Mt. Loanialu, 19°30'S, 169°23'E, 540 m alt., 8, Nov. 2001 (Iwashina 01-56).

*Blechnum norfolkianum* (Heward) C. Chr.

ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 1070-1000 m alt., 25, Oct. 2001 (Matsumoto 01-788b).

*Blechnum opacum* Mett.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 700 m alt., 5, Nov. 2001 (Iwashina 01-34). *Ibid.*, 5, Nov. 2001 (Matsumoto 01-970).

*Blechnum orientale* L.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 5-100 m alt., 5, Nov. 2001 (Matsumoto 01-921).

ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 980 m alt., 25, Oct. 2001 (Matsumoto 01-799).

***Blechnum patersoni*** (R. Br.) Mett.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180–200 m alt., 5, Nov. 2001 (Matsumoto 01-942).

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1350 m alt., 23, Oct. 2001 (Matsumoto 01-760).

***Blechnum vulcanicum*** (Blume) Kuhn

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 600 m alt., 5, Nov. 2001 (Iwashina 01-28).

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1350 m alt., 23, Oct. 2001 (Matsumoto 01-761).

**CULCITACEAE*****Culcita straninea*** (Labill.) Maxon

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170–180 m alt., 5, Nov. 2001 (Matsumoto 01-909).

**CYATHEACEAE*****Cyathea (Cyathea) affinis*** (G. Forst.) Sw.

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1350 m alt., 23, Oct. 2001 (Matsumoto 01-756 and 01-767).

***Cyathea (Sphaeropteris) lunulata*** (G. Forst.) Copel.

ANATOM. Along Inwa Lelchei River, foot of Mt. Nidwon Nelcau, 20°13'S, 169°49'E, 50–200 m alt., 6, Nov. 2001 (Matsumoto 01-985).

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1350 m alt., 23, Oct. 2001 (Matsumoto 01-765). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 980 m alt., 25, Oct. 2001 (Matsumoto 01-802).

TANNA. Top of Mt. Loanialu, 19°30'S, 169°23'E, 540 m alt., 8, Nov. 2001 (Iwashina 01-48).

***Cyathea (Cyathea) aff. decurrens***

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180–200 m alt., 5, Nov. 2001 (Matsumoto 01-941).

**DAVALLIACEAE*****Davallia epiphylla*** Sw.

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-37). Butmas, in lowland forest, 15°22'S, 167°00'E, 500–530 m alt., 24, Oct. 2000 (Sugimura 00-1032). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 1070–1000 m alt., 25, Oct. 2001 (Matsumoto 01-791).

***Davallia fejeensis*** Hook.

ESPIRITU SANTO. Between 2nd Camp and top of Mt. Tabwemasana, 15°21'S, 166°44'E, 1200–1350 m alt., 1, Nov. 2000 (Sugimura 00-1089).

***Humata brackenridgei*** Brownlie

ESPIRITU SANTO. North peak of Mt. Tabwemasana, 1860 m alt., 1, Nov. 2000 (Iwashina 00-60). Between 2nd Camp and top of Mt. Tabwemasana, on the north ridge of Mt. Tabwemasana, 15°22'S, 166°44'E, 1380-1800 m alt., 1, Nov. 2000 (Sugimura 00-1117). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600-1350 m alt., 23, Oct. 2001 (Matsumoto 01-744).

TANNA. Top of Mt. Loanialu, 19°30'S, 169°23'E, 540 m alt., 8, Nov. 2001 (Iwashina 01-53).

***Humata pusilla*** (Mett.) Carruth.

ANATOM. Along Inwa Lelchei River, foot of Mt. Nidwon Nelcau, 20°13'S, 169°49'E, 50-200 m alt., 6, Nov. 2001 (Matsumoto 01-981).

***Humata sessilifolia*** (Blume) Mett.

ANATOM. Along Inwa Lelchei River, foot of Mt. Nidwon Nelcau, 20°13'S, 169°49'E, 50-200 m alt., 6, Nov. 2001 (Matsumoto 01-980).

ESPIRITU SANTO. Butmas, in lowland forest, 15°22'S, 167°00'E, 500-530 m alt., 24, Oct. 2000 (Sugimura 00-1029). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 22, Oct. 2001 (Matsumoto 01-713).

***Leucostegia pallida*** (Mett.) Copel.

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 21, Oct. 2001 (Matsumoto 01-682). Ibid., 1600-1350 m alt., 23, Oct. 2001 (Matsumoto 01-770).

***Scyphularia pycnocarpa*** (Brack.) Copel.

ANATOM. Along Inwa Lelchei River, foot of Mt. Nidwon Nelcau, 20°13'S, 169°49'E, 50-200 m alt., 6, Nov. 2001 (Matsumoto 01-979).

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-33).

**DENNSTAEDTIACEAE*****Dennstaedtia flaccida*** (G. Forst.) Bernh.

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-20). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 21, Oct. 2001 (Matsumoto 01-677).

***Dennstaedtia samoensis*** (Brack.) T. Moore -*Sitolobium samoense* Brack., U. S. Expl. Exp. 1838-42, 16: 274, pl. 38, fig. 1, 1854.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-950).

ESPIRITU SANTO. Between Matantas and Butmas, 300 m alt., 7, Nov. 2000 (Iwashina 00-100).

***Microlepia speluncae*** (L.) T. Moore

EFATE. Mele Maat Fall, north of Port Vila, 17°41'S, 168°15'E, 80 m alt, 3, Nov. 2001 (Matsumoto 01-888).

ESPIRITU SANTO. Vatthe Conservation Area, near Matantas, 15°10'S, 166°57'E, 50 m alt., 29, Oct. 2001 (Matsumoto 01-851).

*Microlepidia strigosa* (Thunb.) C. Presl

ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15° 20'S, 166°44'E, 800–600 m alt., 25, Oct. 2001 (Matsumoto 01–805).

*Orthiopteris tenuis* (Brack.) Brownlie

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1350 m alt., 23, Oct. 2001 (Matsumoto 01–750).

**DICKSONIACEAE***Dicksonia brackenridgei* Mett.

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1350 m alt., 23, Oct. 2001 (Matsumoto 01–766).

**DIPTERIDACEAE***Dipteris conjugata* Reinw.

ANATOM. Along Inwa Lelchei River, foot of Mt. Nidwon Nelcau, 20°13'S, 169°49'E, 50–200 m alt., 6, Nov. 2001 (Matsumoto 01–984).

**DRYOPTERIDACEAE***Acrophorus blumei* Ching ex C. Chr.

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1350 m alt., 23, Oct. 2001 (Matsumoto 01–734).

*Arachniodes aristata* (G. Forst.) Tindale

ESPIRITU SANTO. Between Nokovula and Kerepua River, Mt. Tabwemasana range, 1000 m alt., 2, Nov. 2000 (Iwashina 00–76). Between 1st Camp and 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°43'E, 750 m alt., 20, Oct. 2001 (Matsumoto 01–641). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 21, Oct. 2001 (Matsumoto 01–669). Santo Forest Research Station, 15°15'S, 167°06'E, 150 m alt., 30, Oct. 2001 (Matsumoto 01–861).

*Ctenitis fijiensis* (Hook.) Copel.

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00–24). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1800 m alt., 23, Oct. 2001 (Matsumoto 01–715).

*Dryopteris hasseltii* (Blume) C. Chr. -*Arachniodes hassertii* (Blume) Ching

ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15° 20'S, 166°44'E, 1070–1200 m alt., 25, Oct. 2001 (Matsumoto 01–776 and 01–782).

Note: Anadromous branching and indusium absent.

*Dryopteris hirtipes* (Blume) Kuntze

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 21, Oct. 2001 (Matsumoto 01–676).



***Dryopteris maxima*** (Baker) C. Chr. -*Arachniodes maxima* (Baker) Brownlie

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 21, Oct. 2001 (Matsumoto 01–665). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1800 m alt., 23, Oct. 2001 (Matsumoto 01–723).

Note: Anadromous branching and indusium present.

***Dryopteris subarborea*** (Baker) C. Chr. -*D. arborescens* (Baker) Kuntze

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 21, Oct. 2001 (Matsumoto 01–658). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 1070–1000 m alt., 25, Oct. 2001 (Matsumoto 01–788a).

***Lastreopsis davallioides*** (Brack.) Tindale

ESPIRITU SANTO. North ridge of Mt. Tabwemasana, 1750 m alt., 1, Nov. 2000 (Iwashina 00–66). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1350 m alt., 23, Oct. 2001 (Matsumoto 01–739).

***Pleocnemia irregularis*** (C. Presl) Holttum

ESPIRITU SANTO. West of Naranga, 280 m alt., 8, Nov. 2000 (Iwashina 00–109).

***Pleocnemia leuzeana*** (Gaud.) C. Presl

ESPIRITU SANTO. Vatthe Conservation Area, near Matantas, 15°10'S, 166°57'E, 50 m alt., 29, Oct. 2001 (Matsumoto 01–844). Santo Forest Research Station, 15°15'S, 167°06'E, 150 m alt., 30, Oct. 2001 (Matsumoto 01–863).

***Polystichum* aff. *aculeatum* var. *samoense***

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00–31). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 22, Oct. 2001 (Matsumoto 01–697 and 01–704). Butmas, 15°21'S, 166°58'E, 550 m alt., 28, Oct. 2001 (Matsumoto 01–835).

Note: Indusium absent on young sorus. Scales ciliate margin and blackish lacerate sometimes becoming no blackish color (Matsumoto 01–835).

***Polystichum* aff. *pilosum***

ESPIRITU SANTO. North ridge of Mt. Tabwemasana, 1800 m alt., 1, Nov. 2000 (Iwashina 00–75). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1800 m alt., 23, Oct. 2001 (Matsumoto 01–717 and 01–718).

***Stenosemia aurita*** C. Presl

ESPIRITU SANTO. Santo Forest Research Station, 15°15'S, 167°06'E, 150 m alt., 30, Oct. 2001 (Matsumoto 01–876).

***Tectaria crenata*** Cav.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180–200 m alt., 5, Nov. 2001 (Matsumoto 01–975).

ESPIRITU SANTO. Butmas, 15°21'S, 166°58'E, 550 m alt., 28, Oct. 2001 (Matsumoto 01–833).

***Tectaria degeneri*** Copel.

ESPIRITU SANTO. Between Matantas and Butmas, 300 m alt., 7, Nov. 2000 (Iwashina 00–103).

***Tectaria dissecta*** (G. Forst.) Lellinger

EFATE. Mele Maat Fall, north of Port Vila, 80 m alt., 11, Nov. 2000 (Iwashina 00–112). Ibid., 17°41'S, 168°15'E, 80 m alt., 3, Nov. 2001 (Matsumoto 01–887).

TANNA. Near White Grass Ocean Resort, 19°26'S, 169°49'E, 40 m alt., 7, Nov. 2001 (Iwashina 01-47).

*Tectaria* aff. *dissecta*

ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15° 20'S, 166°44'E, 600-450 m alt., 25, Oct. 2001 (Matsumoto 01-817).

Note: Veins forming coastal and costular areoles, otherwise free, indusium present.

**ELAPHOGLOSSACEAE**

*Elaphoglossum blumeanum* (Fée) J. Sm.

ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15° 20'S, 166°44'E, 1070-1000 m alt., 25, Oct. 2001 (Matsumoto 01-796).

*Elaphoglossum* sp.

ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15° 20'S, 166°44'E, 1070-1000 m alt., 25, Oct. 2001 (Matsumoto 01-797).

Note: Sterile frond.

**EQUISETACEAE**

*Equisetum ramosissimum* Desf. subsp. *debile* (Roxb.) Hauke

ANATOM. Along Inwa Lelchei River, foot of Mt. Nidwon Nelcau, 20°13'S, 169°49'E, 50-200 m alt., 6, Nov. 2001 (Matsumoto 01-987).

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-40).

**GLEICHENIACEAE**

*Dicranopteris linearis* (Burm.) Underw.

ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15° 20'S, 166°44'E, 980 m alt., 25, Oct. 2001 (Matsumoto 01-798).

*Dicranopteris caudata* (Burm.) Underw.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 5-100 m alt., 5, Nov. 2001 (Matsumoto 01-919).

*Gleichenia (Sticherus) milnei* Baker

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 5-100 m alt., 5, Nov. 2001 (Matsumoto 01-922).

*Gleichenia (Sticherus) oceanica* Kuhn

ESPIRITU SANTO. North ridge of Mt. Tabwemasana, 1650 m alt., 1, Nov. 2000 (Iwashina 00-61). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600-1350 m alt., 23, Oct. 2001 (Matsumoto 01-731).

## GRAMMITIDACEAE

*Calymmodon latearatus* Copel.

ESPIRITU SANTO. Near Narango, edge of forest, 15°24'S, 166°59'E, 280–330 m alt., 8, Nov. 2000 (Sugimura 00–1095). Between 2nd Camp and top of Mt. Tabwemasana, on the north ridge of Mt. Tabwemasana, 15°22'S, 166°44'E, 1380–1800 m alt., 1, Nov. 2000 (Sugimura 00–1120). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1800 m alt., 23, Oct. 2001 (Matsumoto 01–727).

*Ctenopteris blechnoides* (Grev.) Wagner & Grether

ANATOM. Near top of Mt. Ukapaerek, 800 m alt., 5, Nov. 2001 (Iwashina 01–23).

*Grammitis hirtelloides* (Copel.) Copel.

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1350 m alt., 23, Oct. 2001 (Matsumoto 01–753).

*Grammitis hookeri* (Brack.) Copel.

ESPIRITU SANTO. Between 2nd Camp and top of Mt. Tabwemasana, on the north ridge of Mt. Tabwemasana, 15°22'S, 166°44'E, 1380–1800 m alt., 1, Nov. 2000 (Sugimura 00–1099). North ridge of Mt. Tabwemasana, 1750 m alt., 1, Nov. 2000 (Iwashina 00–67).

*Prosaptia contigua* (G. Forst.) C. Presl

ANATOM. Near top of Mt. Ukapaerek, 800 m alt., 5, Nov. 2001 (Iwashina 01–24). Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180–200 m alt., 5, Nov. 2001 (Matsumoto 01–933).

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00–19). Between 1st Camp and 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°43'E, 970 m alt., 20, Oct. 2001 (Matsumoto 01–656). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 21, Oct. 2001 (Matsumoto 01–684). Ibid., 1600–1350 m alt., 23, Oct. 2001 (Matsumoto 01–747).

## HEMIONITIDACEAE

*Austrogramme decipiens* (Mett. ex Kuhn) Hennisman -*Aspleniopsis decipiens* Mett. ex Kuhn

ANATOM. Mt. Ukapaerek, 700 m alt., 5, Nov. 2001 (Iwashina 01–33). Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170–180 m alt., 5, Nov. 2001 (Matsumoto 01–911b).

## HYPOLEPIDACEAE

*Histiopteris incisa* (Thunb.) J. Sm.

ESPIRITU SANTO. North ridge of Mt. Tabwemasana, 1700 m alt., 1, Nov. 2000 (Iwashina 00–63). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1800 m alt., 23, Oct. 2001 (Matsumoto 01–719).

*Histiopteris sinuata* (Brack.) J. Sm.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170–180 m alt., 5, Nov. 2001 (Matsumoto 01–899).

*Hypolepis elegans* Carruth.

ANATOM. Near top of Mt. Ukapaerek, 800 m alt., 5, Nov. 2001 (Iwashina 01-25).

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-34). Between 2nd Camp and top of Mt. Tabwemasana, on the north ridge of Mt. Tabwemasana, 15° 22'S, 166°44'E, 1380-1800 m alt., 1, Nov. 2000 (Sugimura 00-1143). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 21, Oct. 2001 (Matsumoto 01-663).

*Pteridium revolutum* (Blume) Nakai

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 5-100 m alt., 5, Nov. 2001 (Matsumoto 01-923).

## LINDSAEACEAE

*Lindsaea ensifolia* Sw.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170-180 m alt., 5, Nov. 2001 (Matsumoto 01-916).

*Lindsaea herveyi* Carruth. ex Seem.

ANATOM. Near top of Mt. Ukapaerek, 800 m alt., 5, Nov. 2001 (Iwashina 01-21). Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170-180 m alt., 5, Nov. 2001 (Matsumoto 01-913 and 01-915).

EFATE. Forari Demonstration Forest Area, east Efate, 300 m alt., 14, Nov. 2000 (Iwashina 00-117).

ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15° 20'S, 166°44'E, 1070-1200 m alt., 25, Oct. 2001 (Matsumoto 01-779).

*Lindsaea pacifica* Kramer

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-937).

*Lindsaea pulchra* (Brack.) Carruth. ex Seem.

ANATOM. Mt. Ukapaerek, 600 m alt., 5, Nov. 2001 (Iwashina 01-29). Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170-180 m alt., 5, Nov. 2001 (Matsumoto 01-898).

*Sphenomeris chinensis* (L.) Maxon

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170-180 m alt., 5, Nov. 2001 (Matsumoto 01-895).

*Tapeinidium denhamii* (Hook.) C. Chr.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170-180 m alt., 5, Nov. 2001 (Matsumoto 01-906).

## LOMARIOPSIDACEAE

*Bolbitis lonchophora* (Fée) C. Chr. -*B. palustris* (Brack.) Hennisman

ESPIRITU SANTO. Siketket, in lowland forest, 15°16'S, 166°58'E, 300 m alt., 7, Nov. 2000 (Sugimura 00-1167).

*Bolbitis quoyana* (Gaudich.) Ching

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180–200 m alt., 5, Nov. 2001 (Matsumoto 01-943).

EFATE. Mele Maat Fall, north of Port Vila, 17°41'S, 168°15'E, 80 m alt, 3, Nov. 2001 (Matsumoto 01-885).

ESPIRITU SANTO. Vatthe Conservation Area, near Matantas, 50 m alt., 6, Nov. 2000 (Iwashina 00-79). Ibid., 29, Oct. 2001 (Matsumoto 01-845). Between Luganville and Tangoa Is., 1 m alt., 26, Oct. 2001 (Iwashina 01-8).

*Lomagamma* aff. *cordipinna*

EFATE. Mele Maat Fall, north of Port Vila, 17°41'S, 168°15'E, 80 m alt, 3, Nov. 2001 (Matsumoto 01-879).

ESPIRITU SANTO. Between Matantas and Butmas, 300 m alt., 7, Nov. 2000 (Iwashina 00-101). Butmas, 15°21'S, 166°58'E, 550 m alt., 28, Oct. 2001 (Matsumoto 01-834). East of Butmas, 15°20'S, 167°04'E, 280 m alt., 28, Oct. 2001 (Matsumoto 01-840). Santo Forest Research Station, 15°15'S, 167°06'E, 150 m alt., 30, Oct. 2001 (Matsumoto 01-867).

*Lomagamma polyphylla* Brack.

ANATOM. Along Inwa Lelchei River, foot of Mt. Nidwon Nelcau, 20°13'S, 169°49'E, 50–200 m alt., 6, Nov. 2001 (Matsumoto 01-977).

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 22, Oct. 2001 (Matsumoto 01-712). Butmas, 15°21'S, 166°58'E, 550 m alt., 28, Oct. 2001 (Matsumoto 01-832). Santo Forest Research Station, 15°15'S, 167°06'E, 150 m alt., 30, Oct. 2001 (Matsumoto 01-866).

*Lomariopsis brackenridgei* Carruth.

ESPIRITU SANTO. Vatthe Conservation Area, near Matantas, 50 m alt., 6, Nov. 2000 (Iwashina 00-90). Ibid., 29, Oct. 2001 (Matsumoto 01-857). Between Matantas and Butmas, 300 m alt., 7, Nov. 2000 (Iwashina 00-96).

## LOXOGRAMMACEAE

*Loxogramme parksii* Copel.

ESPIRITU SANTO. Butmas, 500 m alt., 24, Oct. 2000 (Iwashina 00-13). Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-25 and 00-28). Between 2nd Camp and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°43'E, 700–1115 m alt., 2, Nov. 2000 (Sugimura 00-1147). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 22, Oct. 2001 (Matsumoto 01-699 and 01-710). Butmas, 15°21'S, 166°58'E, 550 m alt., 28, Oct. 2001 (Matsumoto 01-830).

## LYCOPODIACEAE

*Lycopodium carinatum* Desv.

ESPIRITU SANTO. North ridge of Mt. Tabwemasana, 1750 m alt., 1, Nov. 2000 (Iwashina 00-69).

***Lycopodium cernuum* L.**

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 5–100 m alt., 5, Nov. 2001 (Matsumoto 01–920).

ESPIRITU SANTO. Between 2nd Camp and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°43'E, 700–1115 m alt., 2, Nov. 2000 (Sugimura 00–1152). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 980 m alt., 25, Oct. 2001 (Matsumoto 01–803b).

***Lycopodium foliosum* Copel.**

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170–180 m alt., 5, Nov. 2001 (Matsumoto 01–893).

ESPIRITU SANTO. Between 1st Camp and 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°43'E, 970 m alt., 20, Oct. 2001 (Matsumoto 01–652).

***Lycopodium nummularifolium* Blume**

ESPIRITU SANTO. Butmas, 500 m alt., 24, Oct. 2000 (Iwashina 00–11). Between 2nd Camp and Nokovula, Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 31, Oct. 2000 (Sugimura 00–1084).

***Lycopodium parksii* Copel.**

ESPIRITU SANTO. Between 2nd Camp and top of Mt. Tabwemasana, on the north ridge of Mt. Tabwemasana, 15°22'S, 166°44'E, 1380–1800 m alt., 1, Nov. 2000 (Sugimura 00–1101). Between 1st Camp and 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°43'E, 970 m alt., 20, Oct. 2001 (Matsumoto 01–655). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1350 m alt., 23, Oct. 2001 (Matsumoto 01–738). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 1070 m alt., 25, Oct. 2001 (Matsumoto 01–773).

***Lycopodium phlegmaria* L. *sensu lato***

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170–180 m alt., 5, Nov. 2001 (Matsumoto 01–894).

EFATE. Forari Demonstration Forest Area, east Efate, 300 m alt., 14, Nov. 2000 (Iwashina 00–114).

***Lycopodium serratum* Thunb. var. *longipetiolatum* Spring**

ESPIRITU SANTO. Between 2nd Camp and top of Mt. Tabwemasana, on the north ridge of Mt. Tabwemasana, 15°22'S, 166°44'E, 1380–1800 m alt., 1, Nov. 2000 (Sugimura 00–1102).

***Lycopodium melanesicum* Brownlie**

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1350 m alt., 23, Oct. 2001 (Matsumoto 01–754).

***Lycopodium squarrosus* G. Forst.**

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170–180 m alt., 5, Nov. 2001 (Matsumoto 01–892).

ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 1070–1200 m alt., 25, Oct. 2001 (Matsumoto 01–786).

***Lycopodium volubile* G. Forst.**

ESPIRITU SANTO. North peak of Mt. Tabwemasana, 1860 m alt., 1, Nov. 2000 (Iwashina 00–59). Between 2nd Camp and top of Mt. Tabwemasana, on the north ridge of Mt. Tabwemasana, 15°22'S,

166°44'E, 1380–1800 m alt., 1, Nov. 2000 (Sugimura 00-1107). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1350 m alt., 23, Oct. 2001 (Matsumoto 01-732b).

#### LYGODIACEAE

##### *Lygodium reticulatum* Schkuhr

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180–200 m alt., 5, Nov. 2001 (Matsumoto 01-939 and 01-971). Along Inwa Lelchei River, foot of Mt. Nidwon Nelcau, 20°13'S, 169°49'E, 50–200 m alt., 6, Nov. 2001 (Matsumoto 01-978).

ESPIRITU SANTO. West of Naranga, 280 m alt., 8, Nov. 2000 (Iwashina 00-105). Near Tangoa Is., 1 m alt., 26, Oct. 2001 (Iwashina 01-4). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 800–600 m alt., 25, Oct. 2001 (Matsumoto 01-806).

#### MARATTIACEAE

##### *Marattia smithii* Mett.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170–180 m alt., 5, Nov. 2001 (Matsumoto 01-911a).

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1350 m alt., 23, Oct. 2001 (Matsumoto 01-771).

#### NEPHROLEPIDACEAE

##### *Nephrolepis biserrata* (Sw.) Schott

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170–180 m alt., 5, Nov. 2001 (Matsumoto 01-900).

##### *Nephrolepis hirsutula* (G. Forst.) C. Presl

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180–200 m alt., 5, Nov. 2001 (Matsumoto 01-973).

ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 980 m alt., 25, Oct. 2001 (Matsumoto 01-801).

##### *Nephrolepis lauterbachii* Christ

ESPIRITU SANTO. North peak of Mt. Tabwemasana, 1860 m alt., 1, Nov. 2000 (Iwashina 00-57). Between 2nd Camp and Mt. Tabwemasana, on the north ridge of Mt. Tabwemasana, 15°22'S, 166°44'E, 1380–1800 m alt., 1, Nov. 2000 (Sugimura 00-1137). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600–1350 m alt., 23, Oct. 2001 (Matsumoto 01-733).

##### *Nephrolepis saligna* Carruth.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180–200 m alt., 5, Nov. 2001 (Matsumoto 01-964 and 01-974).

ESPIRITU SANTO. Butmas, 500 m alt., 24, Oct. 2000 (Iwashina 00-6). Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-27).

TANNA. Top of Mt. Loanialu, 19°30'S, 169°23'E, 540 m alt., 8, Nov. 2001 (Iwashina 01-50 and 01-55).

## OLEANDRACEAE

*Oleandra neriiformis* Cav.

ANATOM. Top of Mt. Ukapaerek, 828 m alt., 5, Nov. 2001 (Iwashina 01-26).

ESPIRITU SANTO. Between 1st Camp and 2nd Camp, Mt. Tabwemasana range, 15°20'S, 166°43'E, 290-800 m alt., 30, Oct. 2000 (Sugimura 00-1067). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600-1350 m alt., 23, Oct. 2001 (Matsumoto 01-752).

## OPHIOGLOSSACEAE

*Ophioderma pendulum* (L.) C. Presl

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-962).

ESPIRITU SANTO. Between 2nd Camp and Nokovula, Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 31, Oct. 2000 (Sugimura 00-1085). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600-1350 m alt., 23, Oct. 2001 (Matsumoto 01-772). Near Tangoa Is., 1 m alt., 26, Oct. 2001 (Iwashina 01-2).

*Ophioglossum reticulatum* L.

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 21, Oct. 2001 (Matsumoto 01-667).

## OSMUNDACEAE

*Leptopteris wilkesiana* (Brack.) Christ

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600-1350 m alt., 23, Oct. 2001 (Matsumoto 01-751).

## POLYPODIACEAE

*Belvisia mucronata* (Fée) Copel. -*B. callifolia* (C. Chr.) Copel. auct. Matsumoto *et al.* (1998)

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-945 and 01-946).

ESPIRITU SANTO. Butmas, 500 m alt., 24, Oct. 2000 (Iwashina 00-15). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600-1350 m alt., 23, Oct. 2001 (Matsumoto 01-735 and 01-769). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 1070 m alt., 25, Oct. 2001 (Matsumoto 01-774 and 01-775).

TANNA. Top of Mt. Loanialu, 19°30'S, 169°23'E, 540 m alt., 8, Nov. 2001 (Iwashina 01-51).

*Belvisia spicata* (L. f.) Copel. -*B. revoluta* Blume, *B. melanesica* Brownlie auct. Matsumoto *et al.* (1998)

ESPIRITU SANTO. North ridge of Mt. Tabwemasana, 1800 m alt., 1, Nov. 2000 (Iwashina 00-72). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600-1350 m alt., 23, Oct. 2001 (Matsumoto 01-736).

*Drynaria rigidula* (Sw.) Bedd.

ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range,



15°20'S, 166°44'E, 980 m alt., 25, Oct. 2001 (Matsumoto 01-800).

***Goniophlebium subauriculatum*** (Blume) C. Presl

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-18, 00-30 and 00-47). North ridge of Mt. Tabwemasana, 1750 m alt., 1, Nov. 2000 (Iwashina 00-70). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 21, Oct. 2001 (Matsumoto 01-679).

***Lemmaphyllum accedens*** (Blume) Donk

ESPIRITU SANTO. Butmas, in lowland forest, 15°22'S, 167°00'E, 500-530 m alt., 24, Oct. 2000 (Sugimura 00-1030). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600-1800 m alt., 23, Oct. 2001 (Matsumoto 01-714).

***Microsorium punctatum*** (L.) Copel.

ESPIRITU SANTO. Vatthe Conservation Area, near Matantas, 50 m alt., 6, Nov. 2000 (Iwashina 00-87 and 00-92). Ibid., 29, Oct. 2001 (Matsumoto 01-853). Near Tangoa Is., 1 m alt., 26, Oct. 2001 (Iwashina 01-5). Seashore, in front of Tangoa Is., 15°35'25''S, 166°58'54''E, 26, Oct. 2001 (Tanaka 62).

***Phymatosorus papuanus*** (Baker) S. Matsumoto = *Microsorium papuanum* (Baker) Parris -*P. scolopendria* auct. Brownlie (1977)

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-963). Along Inwa Lelchei River, foot of Mt. Nidwon Nelcau, 20°13'S, 169°49'E, 50-200 m alt., 6, Nov. 2001 (Matsumoto 01-982).

EFATE. Mele Maat Fall, north of Port Vila, 17°41'S, 168°15'E, 80 m alt, 3, Nov. 2001 (Matsumoto 01-883).

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-23). Between Matantas and Butmas, 300 m alt., 7, Nov. 2000 (Iwashina 00-97). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 21, Oct. 2001 (Matsumoto 01-670).

TANNA. Top of Mt. Loanialu, 19°30'S, 169°23'E, 540 m alt., 8, Nov. 2001 (Iwashina 01-58).

***Phymatosorus powerii*** (Baker) Pic. Serm.

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 22, Oct. 2001 (Matsumoto 01-705). Ibid., 1600-1350 m alt., 23, Oct. 2001 (Matsumoto 01-743).

***Phymatosorus scolopendria*** (Burm. f.) Pic. Serm.

EFATE. Pang Pang, seashore, 17°41'S, 168°32'E, 2 m alt., 20, Oct. 2000 (Sugimura 00-1009). Ibid., on risen coral rock, 3, Nov. 2001 (Matsumoto 01-891). Mele Maat Fall, north of Port Vila, 17°41'S, 168°15'E, 80 m alt, 3, Nov. 2001 (Matsumoto 01-882).

ERAKOR. Seashore, near Port Vila, 17°47'S, 168°18'E, 2 m alt., 20, Oct. 2000 (Sugimura 00-1019).

ESPIRITU SANTO. Seashore, Saraoutou, 15°27'00''S, 167°12'19''E, 19, Oct. 2001 (Tanaka 16). Hotel Santo, Luganville, 5 m alt., 30, Oct. 2001 (Matsumoto 01-875).

***Pyrrhosia adnascens*** (Sw.) Ching, *sensu* K.-H. Shing and K. Iwatsuki (1997)

ESPIRITU SANTO. Seashore, in front of Tangoa Is., 15°35'25''S, 166°58'54''E, 26, Oct. 2001 (Tanaka 61).

*Pyrrhosia confluens* (R. Br.) Ching

ESPIRITU SANTO. Between 1st Camp and 2nd Camp (Nokovula), Mt. Tabwemasana range, 15° 20'S, 166°43'E, 650 m alt., 20, Oct. 2001 (Matsumoto 01-640).

*Pyrrhosia lanceolata* (L.) Farwell

ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15° 20'S, 166°44'E, 800-600 m alt., 25, Oct. 2001 (Matsumoto 01-812).

*Pyrrhosia longifolia* (Burm. f.) C. V. Morton

IRIRIKI. Near Port Vila, 17°45'S, 168°18'E, 5 m alt., 19, Oct. 2000 (Sugimura 00-1003). Ibid., on tree trunk, 5-10 m alt., 12, Oct. 2001 (Matsumoto 01-608).

TANNA. Near White Grass Ocean Resort, 19°26'S, 169°49'E, 5 m alt., 9, Nov. 2001 (Iwashina 01-60).

*Selliguea feeioides* Copel.

ESPIRITU SANTO. Between 2nd Camp and top of Mt. Tabwemasana, on the north ridge of Mt. Tabwemasana, 15°22'S, 166°44'E, 1380-1800 m alt., 1, Nov. 2000 (Sugimura 00-1119). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600-1800 m alt., 23, Oct. 2001 (Matsumoto 01-741 and 01-742).

*Selliguea plantaginea* Brack.

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-38). North peak of Mt. Tabwemasana, 1860 m alt., 1, Nov. 2000 (Iwashina 00-58). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600-1800 m alt., 23, Oct. 2001 (Matsumoto 01-716, 01-741 and 01-742).

TANNA. Top of Mt. Loanialu, 19°30'S, 169°23'E, 540 m alt., 8, Nov. 2001 (Iwashina 01-52).

## PSILOTACEAE

*Psilotum complanatum* Sw.

ANATOM. Between Anelghowhat and Mt. Ukaapaerek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-954).

## PTERIDACEAE

*Acrostichum aureum* L.

ANATOM. Anelghowhat, 20°14'S, 169°47'E, 5 m alt., 6, Nov. 2001 (Matsumoto 01-976).

ESPIRITU SANTO. Navota, 4 km west of Neave to Tangoa, 15°34'58''S, 166°59'55''E, 26, Oct. 2001 (Tanaka 53).

*Acrostichum speciosa* Willd.

EFATE. Pang Pang, on risen coral rock, 17°39'S, 168°31'E, 3, Nov. 2001 (Matsumoto 01-889).

ESPIRITU SANTO. 0.5 km west of Neave to Tangoa, 15°34'51''S, 167°01'55''E, 26, Oct. 2001 (Tanaka 52). Near Tangoa Is., 1 m alt., 26, Oct. 2001 (Iwashina 01-1).

*Pteris comans* G. Forst.

ANATOM. Between Anelghowhat and Mt. Ukaapaerek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-934).

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E,

1000–1070 m alt., 21, Oct. 2001 (Matsumoto 01–687).

*Pteris ensiformis* Burm.

ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15° 20'S, 166°44'E, 800–600 m alt., 25, Oct. 2001 (Matsumoto 01–810). Vatthe Conservation Area, near Matantas, 15°10'S, 166°57'E, 50 m alt., 29, Oct. 2001 (Matsumoto 01–843).

*Pteris excelsa* Gaudich.

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 21, Oct. 2001 (Matsumoto 01–688).

*Pteris pacifica* Hieron.

ESPIRITU SANTO. Vatthe Conservation Area, near Matantas, 50 m alt., 6, Nov. 2000 (Iwashina 00–88). Ibid., 29, Oct. 2001 (Matsumoto 01–852). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 600–450 m alt., 25, Oct. 2001 (Matsumoto 01–819).

*Pteris papuana* Ces.

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00–41). East of Butmas, 15°20'S, 167°04'E, 280 m alt., 28, Oct. 2001 (Matsumoto 01–841).

*Pteris tremula* R. Br.

ESPIRITU SANTO. Between 1st Camp and 2nd Camp (Nokovula), Mt. Tabwemasana range, 15° 20'S, 166°43'E, 750 m alt., 20, Oct. 2001 (Matsumoto 01–645). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 600–450 m alt., 25, Oct. 2001 (Matsumoto 01–816).

*Pteris tripartita* Sw.

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00–35 and 00–39). Vatthe Conservation Area, near Matantas, 50 m alt., 6, Nov. 2000 (Iwashina 00–78). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 21, Oct. 2001 (Matsumoto 01–659 and 01–692).

*Pteris vittata* L.

EFATE. Pang Pang, on risen coral rock, 17°39'S, 168°31'E, 3, Nov. 2001 (Matsumoto 01–890).  
ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15° 20'S, 166°44'E, 600–450 m alt., 25, Oct. 2001 (Matsumoto 01–815).

*Pteris* aff. *cretica*

ESPIRITU SANTO. Around 1st Camp along Kerepua River, 15°19'S, 166°42'E, 270 m alt., 19, Oct. 2001 (Matsumoto 01–637). Between 1st Camp and 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°43'E, 750 m alt., 20, Oct. 2001 (Matsumoto 01–646).

#### SCHIZAEACEAE

*Schizaea dichotoma* (L.) J. Sm.

ANATOM. Near top of Mt. Ukapaerek, 800 m alt., 5, Nov. 2001 (Iwashina 01–19). Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170–180 m alt., 5, Nov. 2001 (Matsumoto 01–914).

EFATE. Forari Demonstration Forest Area, east Efate, 300 m alt., 14, Nov. 2000 (Iwashina 00–119). Ibid., in lowland forest, 17°42'S, 168°32'E, 300 m alt., 14, Nov. 2000 (Sugimura 00–1201).

## SELAGINELLACEAE

*Selaginella distans* E. F. Warb.

ESPIRITU SANTO. West of Naranga, 280 m alt., 8, Nov. 2000 (Iwashina 00-104a). Santo Forest Research Station, 15°15'S, 167°06'E, 150 m alt., 30, Oct. 2001 (Matsumoto 01-869).

*Selaginella durvillei* (Bory) A. Br. ex Kuhn

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170-180 m alt., 5, Nov. 2001 (Matsumoto 01-918).

EFATE. Mele Maat Fall, north of Port Vila, 17°41'S, 168°15'E, 80 m alt, 3, Nov. 2001 (Matsumoto 01-880).

ESPIRITU SANTO. West of Naranga, 280 m alt., 8, Nov. 2000 (Iwashina 00-104b). Around 1st Camp along Kerepua River, Mt. Tabwemasana range, 15°19'S, 166°42'E, 270 m alt., 19, Oct. 2001 (Matsumoto 01-636). Vatthe Conservation Area, near Matantas, 15°10'S, 166°57'E, 50 m alt., 29, Oct. 2001 (Matsumoto 01-855).

*Selaginella firmula* (Bory) A. Br. ex Kuhn

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170-180 m alt., 5, Nov. 2001 (Matsumoto 01-903). Ibid., 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-936).

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600-1350 m alt., 23, Oct. 2001 (Matsumoto 01-748).

## SINOPTERIDACEAE

*Doryopteris concolor* (Langsd. & Fisch.) Kuhn

ESPIRITU SANTO. Between 1st Camp and 2nd Camp, Mt. Tabwemasana range, 15°20'S, 166°43'E, 290-800 m alt., 30, Oct. 2000 (Sugimura 00-1060). Around 1st Camp along Kerepua River, 15°19'S, 166°42'E, 270 m alt., 19, Oct. 2001 (Matsumoto 01-633).

## THELYPTERIDACEAE

*Christella parasitica* (L.) H. Lév.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170-180 m alt., 5, Nov. 2001 (Matsumoto 01-905).

ESPIRITU SANTO. Vatthe Conservation Area, near Matantas, 50 m alt., 6, Nov. 2000 (Iwashina 00-94). Ibid., 29, Oct. 2001 (Matsumoto 01-856). Between Matantas and Butmas, 300 m alt., 7, Nov. 2000 (Iwashina 00-99). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 600-450 m alt., 25, Oct. 2001 (Matsumoto 01-818). Butmas, 15°21'S, 166°58'E, 550 m alt., 28, Oct. 2001 (Matsumoto 01-823).

*Christella dentata* (Forssk.) Brownsey & Jermy

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-969).

ESPIRITU SANTO. Vatthe Conservation Area, near Matantas, 50 m alt., 6, Nov. 2000 (Iwashina 00-86). Ibid., 29, Oct. 2001 (Matsumoto 01-847). Between Matantas and Butmas, 300 m alt., 7, Nov. 2000 (Iwashina 00-98).

*Christella hispidula* (Decne.) Holttum

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180–200 m alt., 5, Nov. 2001 (Matsumoto 01–951).

*Christella subpubescens* (Blume) Holttum

ESPIRITU SANTO. Vatthe Conservation Area, near Matantas, 15°10'S, 166°57'E, 50 m alt., 29, Oct. 2001 (Matsumoto 01–858).

*Christella* aff. *hispidula*

ESPIRITU SANTO. Santo Forest Research Station, 15°15'S, 167°06'E, 150 m alt., 30, Oct. 2001 (Matsumoto 01–865).

*Christella* sp.

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 22, Oct. 2001 (Matsumoto 01–695).

*Macrothelypteris polypodioides* (Hook.) Holttum

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00–52). Along Kerepua River, Mt. Tabwemasana range, 15°19'S, 166°42'E, 150 m alt., 19, Oct. 2001 (Matsumoto 01–630). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 22, Oct. 2001 (Matsumoto 01–691).

*Macrothelypteris torresiana* (Gaudich.) Ching

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180–200 m alt., 5, Nov. 2001 (Matsumoto 01–935).

EFATE. Mele Maat Fall, north of Port Vila, 17°41'S, 168°15'E, 80 m alt, 3, Nov. 2001 (Matsumoto 01–881).

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 22, Oct. 2001 (Matsumoto 01–694).

*Plesioneuron attenuatum* (Brack.) Holttum

ESPIRITU SANTO. Between Nokovula and Kerepua River, Mt. Tabwemasana range, 1000 m alt., 2, Nov. 2000 (Iwashina 00–77). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 1070–1200 m alt., 25, Oct. 2001 (Matsumoto 01–777). East of Butmas, 15°20'S, 167°04'E, 280 m alt., 28, Oct. 2001 (Matsumoto 01–838).

*Pneumatopteris costata* (Brack.) Holttum

ESPIRITU SANTO. Butmas, 15°21'S, 166°58'E, 550 m alt., 28, Oct. 2001 (Matsumoto 01–831). East of Butmas, 15°20'S, 167°04'E, 280 m alt., 28, Oct. 2001 (Matsumoto 01–839). Santo Forest Research Station, 15°15'S, 167°06'E, 150 m alt., 30, Oct. 2001 (Matsumoto 01–859).

*Pneumatopteris parksii* (F. Ballard) Holttum

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170–180 m alt., 5, Nov. 2001 (Matsumoto 01–901).

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00–42). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 22, Oct. 2001 (Matsumoto 01–693).

TANNA. Top of Mt. Loanialu, 19°30'S, 169°23'E, 540 m alt., 8, Nov. 2001 (Iwashina 01–57).

*Pronephrium rubrinerve* (Mett.) Holttum

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170–180 m alt., 5, Nov. 2001 (Matsumoto 01–896).

ESPIRITU SANTO. Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15° 20'S, 166°44'E, 1070–1100 m alt., 25, Oct. 2001 (Matsumoto 01-787).

*Pseudophegopteris persimilis* (Baker) Holttum

ESPIRITU SANTO. Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 22, Oct. 2001 (Matsumoto 01-696).

*Sphaerostephanos decadens* (Baker) Holttum

EFATE. Mele Maat Fall, north of Port Vila, 17°41'S, 168°15'E, 80 m alt., 3, Nov. 2001 (Matsumoto 01-886 and 01-878).

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-36).

*Sphaerostephanos heterocarpus* (Blume) Holttum

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 170–180 m alt., 5, Nov. 2001 (Matsumoto 01-904 and 01-917).

*Sphaerostephanos* aff. *maemonensis*

ESPIRITU SANTO. Butmas, 15°21'S, 166°58'E, 550 m alt., 28, Oct. 2001 (Matsumoto 01-829).

#### TMESIPTERIDACEAE

*Tmesipteris vanuatuensis* A. F. Braithw.

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-21). Between 2nd Camp and Nokovula, Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 31, Oct. 2000 (Sugimura 00-1075). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 21, Oct. 2001 (Matsumoto 01-660).

#### VITTARIACEAE

*Antrophyum alatum* Brack.

ESPIRITU SANTO. Between Matantas and Butmas, 300 m alt., 7, Nov. 2000 (Iwashina 00-95). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000–1070 m alt., 22, Oct. 2001 (Matsumoto 01-711). Santo Forest Research Station, 15°15'S, 167°06'E, 150 m alt., 30, Oct. 2001 (Matsumoto 01-873).

*Antrophyum plantagineum* (Cav.) Kaulf.

EFATE. Mele Maat Fall, north of Port Vila, 80 m alt., 11, Nov. 2000 (Iwashina 00-111).

ESPIRITU SANTO. Vatthe Conservation Area, near Matantas, 50 m alt., 6, Nov. 2000 (Iwashina 00-83, 00-84 and 00-91). Ibid., 29, Oct. 2001 (Matsumoto 01-848). Along Kerepua River, Mt. Tabwemasana range, 15°19'S, 166°42'E, 180–250 m alt., 3, Nov. 2000 (Sugimura 00-1159). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 600–450 m alt., 25, Oct. 2001 (Matsumoto 01-814). Near Tangoa Is. 1 m alt., 26, Oct. 2001 (Iwashina 01-3).

*Antrophyum semicostatum* Blume

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180–200 m alt., 5, Nov. 2001 (Matsumoto 01-959).

ESPIRITU SANTO. Butmas, 500 m alt., 24, Oct. 2000 (Iwashina 00-14). Nokovula, Mt.

Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-17, 00-29 and 00-45). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 22, Oct. 2001 (Matsumoto 01-698). Butmas, 15°21'S, 166°58'E, 550 m alt., 28, Oct. 2001 (Matsumoto 01-827 and 01-828).

*Vaginularia angustissima* (Brack.) Mett.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-960).

ESPIRITU SANTO. Vatthe Conservation Area, near Matantas, 50 m alt., 6, Nov. 2000 (Iwashina 00-81). Between Luganville and Tangoa Is., 1 m alt., 26, Oct. 2001 (Iwashina 01-9). Between 2nd Camp (Nokovula) and 1st Camp, Mt. Tabwemasana range, 15°20'S, 166°44'E, 800-600 m alt., 25, Oct. 2001 (Matsumoto 01-813).

*Vittaria angustifolia* Blume

ESPIRITU SANTO. Vatthe Conservation Area, near Matantas, 50 m alt., 6, Nov. 2000 (Iwashina 00-82). Between 2nd Camp and top of Mt. Tabwemasana, on the north ridge of Mt. Tabwemasana, 15°22'S, 166°44'E, 1380-1800 m alt., 1, Nov. 2000 (Sugimura 00-1100 and 00-1133). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1600-1350 m alt., 23, Oct. 2001 (Matsumoto 01-740). Butmas, 15°21'S, 166°58'E, 550 m alt., 28, Oct. 2001 (Matsumoto 01-824).

*Vittaria elongata* Sw.

ANATOM. Between Anelghowhat and Mt. Ukapaerek, 20°14'S, 169°47'E, 180-200 m alt., 5, Nov. 2001 (Matsumoto 01-961).

ESPIRITU SANTO. Nokovula, Mt. Tabwemasana range, 1150 m alt., 31, Oct. 2000 (Iwashina 00-50). Vatthe Conservation Area, near Matantas, 50 m alt., 6, Nov. 2000 (Iwashina 00-93). West of Naranga, 280 m alt., 8, Nov. 2000 (Iwashina 00-106). Butmas, in lowland forest, 15°22'S, 167°00'E, 500-530 m alt., 24, Oct. 2000 (Sugimura 00-1034). Between Luganville and Tangoa Is., 1 m alt., 26, Oct. 2001 (Iwashina 01-10). Around 2nd Camp (Nokovula), Mt. Tabwemasana range, 15°20'S, 166°44'E, 1000-1070 m alt., 21, Oct. 2001 (Matsumoto 01-685).

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### References

- Andrews, S. B., 1990. Ferns of Queensland. Queensland Department of Primary Industries Brisbane. pp. 1-427.  
 Braithwaite, A. F., 1975. The phytogeographical relationships and origin of the New Hebrides fern flora. Phil. Trans. Royal Soc. London. **B272**: 293-313.  
 ———, 1986. *Tmesipteris* in Vanuatu (New Hebrides). Fern Gaz. **13**: 87-96.  
 Brackenridge, W. D., 1854. Botany, Cryptogamia, Filices including Lycopodiaceae and Hydropterides with a Folio

- Atlas of Forty-six Plates, United States Exploring Expedition During the Years, 1838, 1839, 1840, 1841, 1842. Vol. 16. C. Sherman, Philadelphia, pp.1-357.
- Brownlie, G., 1969. Pteridophytes in Aubréville, A., Flore de la Nouvelle-Calédonie et Dépendances, Fasc. 3. Muséum National d'Histoire Naturelle, Paris. pp. 1-307.
- , 1977. The Pteridophytes Flora of Fiji, Beihefte zur Nova Hedwigia Heft 55. J. Cramer Vaduz, Germany. pp. 1-397.
- Chambers, T. C., A. C. Jermy and J. A. Crabbe, 1971. A collection of ferns from Espiritu Santo, New Hebrides. Brit. Fern Gaz. **10**: 175-182.
- Christensen, C., 1943. A revision of the Pteridophyta of Samoa. Bull. Bernice P. Bishop Museum **177**: 1-138.
- Copeland, E. B., 1932. Pteridophyta. In Guillaumin, A., Contribution to the flora of the New Hebrides plants collected by S. F. Kajewski in 1929. J. Arnold Arbor. **13**: 118-126.
- Crookes, M. A. and H. B. Dobbie, 1963. New Zealand ferns. Whitecombe and Tomlds Ltd., New Zealand. pp. 1-407.
- Hennipman, E., 1997. A monograph of the fern genus *Bolbitis* (Lomariopsidaceae). Leiden Botanical Series No. 2. Leiden Univ. Press. pp. 1-331.
- Holtum, R. E., 1959. Flora Malesiana, Series II, Pteridophyta, Gleicheniaceae. **1** (1): 1-62.
- , 1963a. Flora Malesiana, Series II, Pteridophyta, Cyatheaceae. **1** (2): 65-176.
- , 1963b. The tree fern of the genus *Cyathea* in Australia and the Pacific. Blumea **12**: 241-274.
- , 1968. A revised flora of Malaya, Vol. 2, Ferns of Malaya, 2nd ed. Governm. Print. Office, Singapore. pp. 1-653.
- , 1976. Studies in the family Thelypteridaceae, the genus *Coryphopteris*. Blumea **23**: 18-47.
- , 1977. The family Thelypteridaceae in the Pacific and Australia. Allertonia **1**: 169-234.
- , 1982. Flora Malesiana, Series II, Pteridophyta, Thelypteridaceae. **1** (5): 331-599.
- , 1991. Flora Malesiana, Series II, Pteridophyta, *Tectaria* group. **2** (1): 1-132.
- and E. Hennipman, 1978. Flora Malesiana, Series II, Pteridophyta, *Lomariopsis* group. **1**(4): 255-330.
- Hovenkamp, P., 1986. A monograph of the genus *Pyrrosia* (Polypodiaceae). Leiden Botanical Series **9**: 1-310. E. J. Brill/Leiden Univ. Press, Leiden.
- , 1998. An account of Malay-Pacific species of *Selliguea* (Polypodiaceae). Blumea **43**: 1-108.
- and N. A. P. Franken, 1993. An account of the fern genus *Belvisia* Mirbel (Polypodiaceae). Blumea **37**: 511-527.
- Jones, D. L. and S. C. Clemesha, 1980. Australian ferns and fern allies. The Currawong Press, Sydney. pp. 1-232.
- Kato, M. and K. Iwatsuki, 1985. An unusual submerged aquatic ecotype of *Asplenium unilaterale*. Amer. Fern J. **75**: 73-76.
- Kramer, K. U., 1970. The lindsaeoid ferns of the Old World V. The smaller pacific islands. Blumea **18**: 157-194.
- , 1971. Flora Malesiana, Series II, Pteridophyta, *Lindsaea* group. **1** (3): 177-254.
- Matsumoto, S., T. Iwashina, K. Sugimura, T. Hashimoto and T. Nakamura, 1998. A list of Pteridophytes herbarium specimens from Vanuatu, collected in 1996 and 1997. Ann. Tsukuba Bot. Gard. **17**: 75-100.
- Nakamura, T., 1990. Island of Ponape. The Nature and the Plants. The Report of the Botanical Expedition to Ponape Isl. by Japanese Association of Botanical Gardens. Dai-ichi-Hoki Shuppan Co. pp. 1-220.
- Nooteboom, H. P., 1994. Notes on Davalliaceae II. A revision of genus *Davallia*. Blumea **39**: 151-214.
- , 1997. The microsorioid ferns (Polypodiaceae). Blumea **42**: 261-395.
- Pichi-Sermolli, R. E. G., 1977. Tentamen Pteridophytorum Genera in Taxonomicum Ordinem Redigendi. Webbia **31**: 313-512.
- Piggot, A. C., 1988. Ferns of Malaya in Color. Tropical Press SDN. BHD., Kuala Lumpur. pp. 1-458.
- Rodl-Linder, G., 1990. A monograph of the fern genus *Goniophlebium* (Polypodiaceae). Blumea **34**: 277-423.
- Takamiya, M., 1995. Chromosome studies of ferns and fern-allies in the Republics of Fiji and Vanuatu, South Pacific I. Psilotaceae, Ophioglossaceae, Marattiaceae and Schizaeaceae. Acta Phytotax. Geobot. **46**: 137-145.