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## Pteridophytes of Mo'orea, French Polynesia: Additional New Records

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**ABSTRACT.**—The ferns and lycophytes of Mo'orea, French Polynesia were surveyed as part of the Mo'orea Biocode Project during September 12–13, 2006, September 6–27, 2008, and August 11–28, 2010, resulting in collection of 42 species that had not been previously reported to occur on Mo'orea. Specimen citations, previously known distributions, and taxonomic notes (when appropriate) are given for each new record. New records include 16 species collected for the first time during the Mo'orea Biocode Project, and 26 species collected prior to the project but not included in published species lists. This brings the total number of known Mo'orean pteridophytes to 132 species.

**KEY WORDS.**—Mo'orea, Mo'orea Biocode Project, Ferns, Lycophytes, Pteridophytes

The purpose of the Mo'orea Biocode Project is to “create the first comprehensive inventory of all non-microbial life in a complex tropical ecosystem” (<http://mooreabiocode.org>). The inventory will include molecular, morphological, and ecological data, and serve as a valuable reference library for species identification and further ecological and systematic studies. Studies of ferns and lycophytes (i.e., “pteridophytes”), in particular, will benefit from this inventory because it will enable rapid identification of gametophytes based on DNA sequences, thus enabling detailed field studies of this ecologically important yet poorly known life stage. Initial field work has focused on collecting and identifying sporophytes based on morphology; DNA data and further collections of sporophytes and gametophytes will be added as the project progresses.

Murdock and Smith (2003) compiled a list of 80 Mo'orean pteridophytes based on previous literature reports (8 species) and examination of herbarium specimens (72 species); further records were added by Ranker *et al.* (2005; 8 species), Nitta (2008; 3 species), and Rouhan *et al.* (2008; 1 species). However, previous lists of Mo'orean pteridophytes lacked sufficient sampling of the tallest

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peak on the island, Mt. Tohiewa (1207 m). Additional field surveys were conducted during September 12–13, 2006, September 6–27, 2008, and August 11–28, 2010 as part of the Mo'orea Biocode Project that included explorations of Mt. Tohiewa and yielded 32 new species records from this site; an additional 10 new species records were found on other parts of the island, bringing the total number of Mo'orean pteridophytes to 132 species (including at least 122 native species; the above species counts do not add up exactly due to taxonomic changes). Furthermore, examination of herbarium specimens at PAP revealed many earlier collections made on Mt. Tohiewa and Mt. Mou'aputa by J. Florence and others which had not been included in the lists compiled by Murdock and Smith (2003) or Ranker *et al.* (2005), and are listed here (26 species; including several species listed on the PAP website [Florence *et al.*, 2007] for which specimens were unavailable at the time we visited the herbarium). Collection data, previously known distributions based on published records and specimens available at UC, and taxonomic notes (when appropriate) are given for each new record. Species identifications are based on morphology and may be subject to revision as molecular data become available, especially for uncertain taxa. Family treatment follows Smith *et al.* (2006), except for the acceptance of Athyriaceae as distinct from Woodsiaceae. All data of specimens collected as part of the Mo'orea Biocode Project, including images, are freely available online at <http://biocode.berkeley.edu>.

## ATHYRIACEAE

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

Mo'orea, Mt. Mou'aputa, 17.53483°S, 149.79965°W, ca. 331 m, 15 Aug 2010, *J. Nitta 592* (P, PAP, TNS, UC); Mo'orea, Mt. Mou'aputa, 17.53259°S, 149.80127°W, ca. 397 m, 19 Sep 2008, *J. Nitta 290*, with S. Vinette (P, PAP, TNS, UC). Epipetric, rock face next to stream. Previously known from the Philippines, Borneo, Java, Bali, Sumbawa, Ternate, Sulawesi, Fiji, Samoa, and Tahiti (Kato, 1984).

***Deparia petersenii*** (Kunze) M. Kato subsp. ***congrua*** (Brack.) M. Kato

Mo'orea, Mt. Tohiewa, 17.55486°S, 149.81502°W, ca. 636 m, 24 Aug 2010, *J. Nitta 650*, with V. Liao, J.-Y. Meyer, and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Tohiewa, 17.54984°S, 149.82214°W, ca. 1195 m, 25 Aug 2010, *J. Nitta 685*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Tohiewa, 17.55393°S, 149.8168°W, ca. 803 m, 25 Aug 2010, *J. Nitta 699*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Mou'aputa, 28 Aug 2005, *F. Jacq FJ442* (PAP); Mo'orea, Mt. Tohiewa, vallon entre les deux sommets, 17.55°S, 149.82°W, ca. 1160 m, 9 Jul 1987, *J. Florence 8352* (P, PAP); Mo'orea, flanc S de l'épaulement SE du Mt. Tohiewa, 17.55°S, 149.82°W, ca. 660 m, 21 Oct 1986, *J. Florence 7917* (P, PAP). Epipetric on damp rock walls in cloud forest. Previously known from eastern Australia, the Solomon Islands, Norfolk Island, New Caledonia, Vanuatu, Fiji, Samoa, Rarotonga, and Tahiti; adventive in New Zealand (Kato, 1984).

***Diplazium proliferum*** (Lam.) Thouars

Mo'orea, Ancestor's Trail, 17.53246°S, 149.82974°W, ca. 115 m, 9 Oct 2009, M. Fourdrigniez 590 (UC). Epipetric and terrestrial along trails. Previously known from tropical Africa, Madagascar, Mauritius, Malesia, Australia (Queensland), Fiji, Samoa, and Tahiti. Introduced.

## BLECHNACEAE

***Blechnum pacificum*** Lorence & A. R. Sm., ined.

Mo'orea, pass between Mt. Tiura and Mt. Tatiri, 17.52728°S, 149.87703°W, ca. 761 m, 17 Aug 2010, *J. Nitta 616* (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea, 17.55336°S, 149.81862°W, ca. 994 m, 25 Sep 2008, *J. Nitta 320*, with S. Vinette (P, PAP, TNS, UC); Mo'orea, Mt. Rotui, 17.5106°S, 149.8383°W, ca. 916 m, 10 Sep 2008, *J. Nitta 212*, with S. Vinette (P, PAP, TNS, UC); Mo'orea, flanc Sud de Mt. Mou'aputa, ca. 610 m, 19 Aug 1983, *Florence 4994* (PAP; not examined by us). Terrestrial in cloud forest. Previously known only from the Marquesas and Society Islands (Tahiti).

*Blechnum capense* Burm. f. (synonym *Blechnum sylvaticum* Schelpe), from South Africa, has been historically applied to this species, we believe erroneously.

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

Mo'orea, Mt. Tohiea, 17.55077°S, 149.82263°W, ca. 1190 m, 17 Sep 2008, *J. Nitta 265*, with J.-Y. Meyer, R. Taputuarai, and M. Fourdrigniez (P, UC); Mo'orea, Mt. Mou'aputa, 17.52644°S, 149.80339°W, ca. 823 m, 19 Sep 2008, *J. Nitta 288*, with S. Vinette (P, UC); Mo'orea, Mt. Tohiea, vallon entre les deux sommets, 17.55°S, 149.82°W, ca. 1160 m, 9 Jul 1987, *J. Florence 8351* (P, PAP). Epipetric or epiphytic in cloud forest. Previously known from eastern Australia (McCarthy and Orchard, 1998), Indonesia, Malaysia, New Caledonia, Vanuatu, Fiji, and Tahiti.

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

Mo'orea, Mt. Rotui, 17.5106°S, 149.8383°W, ca. 760 m, 10 Sep 2008, *J. Nitta 217*, with S. Vinette (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea, 17.55103°S, 149.82198°W, ca. 1188 m, 17 Sep 2008, *J. Nitta 271*, with J.-Y. Meyer, R. Taputuarai, and M. Fourdrigniez (P, UC); Mo'orea, crête SE du Mt. Tohiea, 17.55°S, 149.82°W, ca. 1130 m, 10 Jul 1987, *J. Florence 8372* (P, PAP); Mo'orea, flanc Sud de Mt. Mou'aputa, 17.53°S, 149.82°W, ca. 610 m, 19 Aug 1983, *J. Florence 4995* (P, PAP). Epiphytic in cloud forest. Previously known from southeastern Asia, southeastern Australia, Tasmania, New Zealand, and in the Pacific as far east as the Cook Islands, as far north as the Marquesas Islands (Chambers and Farrant, 2001).

## CYATHEACEAE

***Cyathea epaleata*** (Holttum) Holttum

Mo'orea, Mt. Tohiea, 17.55379°S, 149.81633°W, ca. 778 m, 25 Aug 2010, *J. Nitta 703*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt.

Mou'aputa, 17.52644°S, 149.80339°W, ca. 823 m, 19 Sep 2008, *J. Nitta 287* (P, UC), with S. Vinette. Terrestrial in cloud forest. Endemic to the Society Islands, previously known from Tahiti (Holtum, 1964) and Raiatea (J.-Y. Meyer, unpublished data).

## DAVALLIACEAE

***Humata anderssonii*** (Mett. ex Kuhn) C. Chr.

Mo'orea, Mt. Mou'aputa, 17.52728°S, 149.8033°W, ca. 778 m, 15 Aug 2010, *J. Nitta 606* (P, PAP, TNS, UC); Mo'orea, Mt. Rotui, 17.5064°S, 149.8408°W, ca. 760 m, 10 Sep 2008, *J. Nitta 210*, with S. Vinette (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea summit area, 17.54944°S, 149.8225°W, ca. 1176 m, 13 Sep 2006, *J.-Y. Meyer 3127*, with R. Taputuarai and E. Poroï (PAP); Mo'orea, crête SE du Mt. Tohiea, ca. 1010 m, 22 Oct 1986, *J. Florence 7957* (PAP; not examined by us); Mo'orea, flanc Sud de Mt. Mou'aputa, arête terminale, ca. 780 m, 19 Aug 1983, *J. Florence 4996* (PAP; not examined by us). Epiphytic in cloud forest. Endemic to the Society Islands, previously known from Tahaa (J.-Y. Meyer, unpublished data) and Tahiti.

*Humata repens* (L. f.) Diels (synonym *Davallia repens* (L. f.) Kuhn), has been applied in a broad sense to this species (Nooteboom, 1994), but *H. anderssonii* seems specifically distinct. If *H. repens* is circumscribed to include *H. anderssonii*, it has nearly 50 synonyms, based on types that range from Africa, southeastern Asia, Malesia, and Polynesia (Nooteboom, 1994).

## DENNSTAEDTIACEAE

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

Mo'orea, Mt. Tohiea, 17.55066°S, 149.82231°W, ca. 1213 m, 16 Sep 2008, *J. Nitta 679*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea, 17.55331°S, 149.8188°W, ca. 1004 m, 16 Sep 2008, *J. Nitta 258*, with J.-Y. Meyer, R. Taputuarai, and M. Fourdrigniez (P, PAP, TNS, UC). Terrestrial. Pantropical in the broad sense, as treated here, occurring throughout the Neotropics (southern Mexico and Antilles to Bolivia), Juan Fernández Islands, southern Africa, eastern and southeastern Asia, Malesia, New Zealand, and Tasmania (Mickel and Smith, 2004); in the Society Islands, previously known from Tahiti (Copeland, 1932).

***Hypolepis dicksonioides*** (Endl.) Hook.

Mo'orea, Mt. Tohiea, 17.55068°S, 149.82233°W, ca. 1212 m, 16 Sep 2008, *J. Nitta 260*, with J.-Y. Meyer, R. Taputuarai, and M. Fourdrigniez (P, PAP, TNS, UC); Mo'orea, crête SE du Mt. Tohiea, 17.55°S, 149.82°W, ca. 1100 m, 23 Oct 1986, *J. Florence 7968* (P, PAP). Terrestrial. Previously known from New Zealand, Norfolk Island, Samoa, the Marquesas Islands, and Tahiti (Brownsey and Smith-Dodsworth, 1989).

***Paesia divaricatissima*** (Dryand.) Copel.

*Paesia tahitensis* Copel.

Mo'orea, Mt. Mou'aputa, 17.5275°S, 149.80313°W, ca. 760 m, 15 Aug 2010, *J. Nitta 594* (P, PAP, TNS, UC); Mo'orea, Mt. Rotui, 17.5106°S, 149.8383°W, ca. 760 m, 10 Sep 2008, *J. Nitta 219*, with S. Vinette (P, PAP, TNS, UC); Mo'orea, crête SE du Mt. Tohiea, ca. 1100 m, 22 Oct 1986, *J. Florence 7967* (PAP; not examined by us). Terrestrial; common on ridges in cloud forest above ca. 750 m. Heretofore, known only from Tahiti (Copeland, 1932).

#### DRYOPTERIDACEAE

##### ***Dryopteris dicksonioides*** (Mett. ex Kuhn) Copel.

Mo'orea, Mt. Tohiea, 17.55126°S, 149.82184°W, ca. 1170 m, 17 Sep 2008, *J. Nitta 274*, with J.-Y. Meyer, R. Taputuarai, and M. Fourdrigniez (P, PAP, TNS, UC); Mo'orea, crête sommitale SE du Mt. Tohiea, ca. 1170 m, 23 Oct 1986, *J. Florence 7973* (PAP; not examined by us). Terrestrial. Endemic to the Society Islands (previously known from Raiatea and Tahiti; Copeland, 1932).

##### ***Dryopteris macrolepidota*** Copel.

Mo'orea, Mt. Tohiea, 17.55343°S, 149.81813°W, ca. 939 m, 24 Aug 2010, *J. Nitta 655*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Mou'aputa, 17.52637°S, 149.80334°W, ca. 823 m, 15 Aug 2010, *J. Nitta 597* (P, PAP, TNS, UC). Terrestrial. Heretofore, known only from Tahiti (Copeland, 1932).

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

Mo'orea, Mt. Tohiea, 17.55449°S, 149.8152°W, ca. 680 m, 24 Aug 2010, *J. Nitta 651*, with V. Liao, J.-Y. Meyer, and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, face of Mt. Tohiea above town of Maatea, 17.5567°S, 149.8225°W, ca. 390 m, 14 Sep 2008, *J. Nitta 240*, with S. Vinette (P, PAP, TNS, UC); Mo'orea, flanc S de l'épaulement SE du Mt. Tohiea, ca. 660 m, 21 Oct 1986, *J. Florence 7916* (PAP; not examined by us). Epiphytic. Widespread, from continental Asia (India, Sikkim, Bhutan, Burma, Thailand, China, Vietnam), throughout Malesia, and Polynesia (Samoa, Tahiti; Nootboom, 1998).

Formerly included in Davalliaceae, but molecular data support placement in Dryopteridaceae (Smith *et al.*, 2006; Tsutsumi and Kato, 2006).

#### GLEICHENIACEAE

##### ***Diplazium longissimum*** (Blume) Nakai

Mo'orea, Mt. Tohiea, 17.55342°S, 149.81895°W, ca. 1035 m, 24 Aug 2010, *J. Nitta 667*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea, 17.55339°S, 149.81891°W, ca. 1017 m, 24 Sep 2008, *J. Nitta 313*, with S. Vinette (P, PAP, TNS, UC); Mo'orea, crête SE du Mt. Tohiea, 17.55°S, 149.82°W, ca. 1150 m, 10 Jul 1987, *J. Florence 8369* (PAP). Terrestrial at high elevation on ridges. Previously known from Malaysia to Polynesia and Australia (Holtum, 1968); in the Society Islands, from Tahiti.

***Sticherus tahitensis*** (Copel.) H. St. John

Mo'orea, Mt. Tohiea summit area, 17°33'00"S, 149°49'21"W, ca. 1180 m, 13 Sep 2006, *J.-Y. Meyer 3134*, with R. Taputuarai and E. Poroi (PAP); Mo'orea, Mt. Tohiea, crête sommitale du sommet N, ca. 1190 m, 9 July 1987, *J. Florence 8360* (PAP; not examined by us). Terrestrial at high elevations on ridges. Endemic to the Society Islands (Tahiti) pending further study.

Sometimes confused with *Sticherus brackenridgei* (E. Fourn.) H. St. John from Melanesia.

## HYMENOPHYLLACEAE

***Hymenophyllum flabellatum*** Labill.

Mo'orea, Mt. Tohiea, 17.55332°S, 149.81876°W, ca. 1007 m, 24 Aug 2010, *J. Nitta 665*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Mou'aputa, 17.52644°S, 149.80339°W, ca. 823 m, 19 Sep 2008, *J. Nitta 283*, with S. Vnette (P, PAP, TNS, UC). Pendant epiphyte in cloud forest. Previously known from Australia, New Zealand, Vanuatu, Fiji, Samoa, and Tahiti (Brownsey and Smith-Dodsworth, 1989; McCarthy and Orchard, 1998).

***Hymenophyllum* cf. *javanicum*** Spreng.

Mo'orea, Mt. Tohiea, 17.55158°S, 149.82132°W, ca. 1148 m, 24 Aug 2010, *J. Nitta 675*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea, 17.55126°S, 149.82184°W, ca. 1170 m, 17 Sep 2008, *J. Nitta 273*, with J.-Y. Meyer, R. Taputuarai, and M. Fourdrigniez (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea summit area, 12 Sep 2006, *J.-Y. Meyer 3126*, with R. Taputuarai and E. Poroi (PAP); Mo'orea, haut vallon de la face SE du Mt. Tohiea, ca. 1120 m, 23 Oct 1986, *J. Florence 7990* (PAP; not examined by us). Epiphytic in cloud forest. Widespread; previously known from Vietnam, Borneo, Indonesia, New Guinea, New Caledonia, and Fiji.

*Hymenophyllum javanicum* and *Hymenophyllum samoense* Baker form a continuous series of morphotypes, including both specimens with flat and undulating laminae (Ebihara, 2008). Mo'orean specimens have undulating laminae, but further study is needed to circumscribe species within this group.

***Hymenophyllum* aff. *multifidum*** (G. Forst.) Sw.

Mo'orea, Mt. Tohiea, 17.55021°S, 149.82254°W, ca. 1178 m, 25 Aug 2010, *J. Nitta 680*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea, 17.55188°S, 149.82111°W, ca. 1143 m, 25 Aug 2010, *J. Nitta 696*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea, 17.55103°S, 149.82198°W, ca. 1188 m, 17 Sep 2008, *J. Nitta 269*, with J.-Y. Meyer, R. Taputuarai, and M. Fourdrigniez (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea, vallon entre les deux sommets, ca. 1150 m, 9 Jul 1987, *J. Florence 8342* (PAP; not examined by us). Epiphytic in cloud forest. Involucres at right angles to lamina.

Originally considered endemic to New Zealand, but Ebihara (2008) reported that it is also known from Vanuatu and Fiji. Mo'orean material differs from New Zealand material in its smaller size, winged stipes, and broader involucres.

***Polyphlebium endlicherianum*** (C. Presl) Ebihara & K. Iwats.

*Trichomanes endlicherianum* C. Presl; *Crepidomanes endlicherianum* (C. Presl) P. S. Green

Mo'orea, Mt. Tohiea, 17.55376°S, 149.81693°W, ca. 804 m, 24 Aug 2010, *J. Nitta 653*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, face of Mt. Tohiea above town of Maatea, 17.5554°S, 149.82254°W, ca. 474 m, 22 Aug 2010, *J. Nitta 638* (P, PAP, TNS, UC); Mo'orea, face of Mt. Tohiea above town of Maatea, 17.55725°S, 149.82242°W, ca. 319 m, 22 Aug 2010, *J. Nitta 629* (P, PAP, TNS, UC). Epipetric at lower elevations in cloud forest. Previously known from New Zealand, Fiji (Brownlie, 1977), the Austral Islands, and the Marquesas Islands.

*Polyphlebium endlicherianum* is occasionally confused with *Polyphlebium borbonicum* (Bosch) Ebihara & Dubuisson, but differs by an obvious row of elongate marginal cells (Nitta, 2008; Ebihara *et al.*, 2009).

***Vandenboschia maxima*** (Blume) Copel.

*Trichomanes maximum* Blume; *Crepidomanes maximum* (Blume) K. Iwats.

Mo'orea, Mt. Tohiea, 17.54984°S, 149.82214°W, ca. 1195 m, 25 Aug 2010, *J. Nitta 686*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Mou'aputa, 17.52716°S, 149.80351°W, ca. 776 m, 15 Aug 2010, *J. Nitta 604* (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea, 17.55362°S, 149.81644°W, ca. 794 m, 25 Sep 2008, *J. Nitta 326*, with S. Vinette (P, UC); Mo'orea, Mt. Tohiea, 17.55366°S, 149.81741°W, ca. 867 m, 16 Sep 2008, *J. Nitta 252*, with J.-Y. Meyer, R. Taputuarai, and M. Fourdrigniez (P, UC); Mo'orea, Mt. Tohiea summit area, 12 Sep 2006, *J.-Y. Meyer 3125*, with R. Taputuarai and E. Poroi (PAP). Terrestrial and epipetric. Widespread, from southeastern Asia (Thailand), throughout Malesia, to the Society Islands (Tahiti, Huahine; Copeland, 1932).

## LINDSAEACEAE

***Lindsaea rigida*** J. Sm.

Mo'orea, Mt. Rotui, 17.5106°S, 149.8383°W, ca. 916 m, 10 Sep 2008, *J. Nitta 216*, with S. Vinette (P, PAP, TNS, UC); Mo'orea, face of Mt. Tohiea above town of Maatea, 17.5567°S, 149.8225°W, ca. 390 m, 14 Sep 2008, *J. Nitta 237*, with S. Vinette (P, PAP, TNS, UC); Mo'orea, Mt. Mou'aputa, 17.52705°S, 149.80333°W, ca. 777 m, 19 Sep 2008, *J. Nitta 284*, with S. Vinette (P, UC); Mo'orea, Mt. Tohiea summit area, 17.55139°S, 149.82139°W, ca. 1150 m, 13 Sep 2006, *J.-Y. Meyer 3135*, with R. Taputuarai and E. Poroi (PAP); Mo'orea, Mt. Tohiea, crête sommitale du sommet N, 17.55°S, 149.82°W, ca. 1190 m, 9 Jul 1987, *J. Florence 8359* (P, PAP). Once to twice pinnate. Previously known from Micronesia (Pohnpei), the Solomon Islands, Vanuatu, and the Society Islands (Tahiti; Kramer, 1970).

*Lindsaea propinqua* Hook. and *Lindsaea pacifica* K. U. Kramer are morphologically similar and included in the same clade as *L. rigida* in a recent molecular study (Lehtonen *et al.*, 2010); Kramer (1970) described *L.*



*propinqua* and *L. pacifica* as terrestrial and *L. rigida* as epiphytic, but Mo'orean plants were observed to be both epiphytic and terrestrial.

## LYCOPODIACEAE

***Huperzia ribourtii*** (Herter) Holub

*Lycopodium ribourtii* Herter

Mo'orea, Mt. Tohiea, 17.55376°S, 149.81693°W, ca. 804 m, 24 Aug 2010, *J. Nitta 652*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea, 17.55345°S, 149.81804°W, ca. 932 m, 25 Sep 2008, *J. Nitta 324*, with S. Vinette (P, UC); Mo'orea, Mt. Tohiea, 19 Jul 2004, *F. Jacq FJ296*, with J.-F. Butaud and F. Laure (PAP; not examined by us); Mo'orea, Mt. Tohiea, 19 Jul 2004, *F. Jacq FJ317*, with J.-F. Butaud and F. Laure (PAP; not examined by us). Epiphytic in cloud forest. Previously known from the Cook Islands and Society Islands (Tahiti; Copeland, 1932).

## OLEANDRACEAE

***Oleandra sibbaldii*** Grev.

Mo'orea, Mt. Tohiea, 17.5534°S, 149.8192°W, ca. 1045 m, 24 Aug 2010, *J. Nitta 670*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea, 17.55335°S, 149.81927°W, ca. 1045 m, 16 Sep 2008, *J. Nitta 259*, with J.-Y. Meyer, R. Taputuarai, and M. Fourdrigniez (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea, 19 Jul 2004, *F. Jacq FJ274* (PAP); Mo'orea, Mt. Tohiea, 19 Jul 2004, *F. Jacq FJ320* (PAP); Mo'orea, crête SE du Mt. Tohiea, 17.55°S, 149.82°W, ca. 1020 m, 22 Oct 1986, *J. Florence 7961* (P, PAP). Epiphytic; common on ridges above ca. 1000 m. Previously known from the Philippines (Tryon, 2000), Indonesia, Fiji (Brownlie, 1977), Samoa (Christensen, 1943), the Marquesas Islands, and the Society Islands (Tahiti; Copeland, 1932).

## POLYPODIACEAE

***Calymmodon* cf. *orientalis*** Copel.

Mo'orea, Mt. Tohiea, 17.55021°S, 149.82254°W, ca. 1178 m, 25 Aug 2010, *J. Nitta 682*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea, 17.55158°S, 149.82132°W, ca. 1148 m, 24 Aug 2010, *J. Nitta 673*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea summit area, 17.54944°S, 149.8225°W, ca. 1176 m, 12 Sep 2006, *J.-Y. Meyer 3124*, with R. Taputuarai and E. Poroi (PAP); Mo'orea, Mt. Tohiea, vallon entre les deux sommets, ca. 1150 m, 9 Jul 1987, *J. Florence 8343* (PAP; determined as *Calymmodon grantii* Copel., not seen by us). Epiphytic in cloud forest. Endemic to the Society Islands, previously known only from Tahiti (Copeland, 1932).

Copeland (1932) described two species of *Calymmodon* from Tahiti which he split on the basis of growth habit (compact in *C. grantii* vs. lax in *C. orientalis*) and paleae length (under 2 mm in *C. grantii* vs. over 2 mm in *C. orientalis*); however, several misdetermined specimens used by Copeland are present at UC, and distinctions between the two are doubtful.

***Grammitis marginelloides*** (J. W. Moore) Copel.

Mo'orea, Mt. Tohiewa, 17.55342°S, 149.81895°W, ca. 1035 m, 24 Aug 2010, *J. Nitta 666*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Tohiewa, 17.55148°S, 149.82146°W, ca. 1159 m, 25 Sep 2008, *J. Nitta 318*, with S. Vinette (P, PAP, UC); Mo'orea, Mt. Tohiewa, 17.5506°S, 149.82262°W, ca. 1199 m, 17 Sep 2008, *J. Nitta 261*, with J.-Y. Meyer, R. Taputuarai, and M. Fourdrigniez (P, PAP, TNS, UC); Mo'orea, Mt. Tohiewa summit area, 17.54944°S, 149.8225°W, ca. 1176 m, 12 Sep 2006, *J.-Y. Meyer 3121*, with R. Taputuarai and E. Poroi (PAP); Mo'orea, Mt. Tohiewa, vallon entre les deux sommets, 17.55°S, 149.82°W, ca. 1150 m, 9 Jul 1987, *J. Florence 8345* (P, PAP). Epiphytic in cloud forest. Endemic to the Society Islands, previously known only from Tahiti.

***Microsorium powellii*** (Baker) Copel.

*Phymatosorus powellii* (Baker) Pic. Serm.

Mo'orea, Mt. Tohiewa, 17.55351°S, 149.81743°W, ca. 877 m, 24 Aug 2010, *J. Nitta 654*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Tohiewa, 17.55341°S, 149.81837°W, ca. 964 m, 24 Sep 2008, *J. Nitta 311*, with S. Vinette (P, UC). Epiphytic. Previously known from the Austral and Society Islands (Tahiti).

***Oreogrammitis raiateensis*** (J. W. Moore) Parris

*Grammitis raiateensis* (J. W. Moore) Copel.

Mo'orea, Mt. Tohiewa, 17.55021°S, 149.82254°W, ca. 1178 m, Aug 2010, *J. Nitta 681*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Tohiewa, 17.55185°S, 149.82114°W, ca. 1138 m, 24 Aug 2010, *J. Nitta 672*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Tohiewa summit area, 12 Sep 2006, *J.-Y. Meyer 3123*, with R. Taputuarai and E. Poroi (PAP); Mo'orea, Mt. Tohiewa summit area, 12 Sep 2006, *J.-Y. Meyer 3140*, with R. Taputuarai and E. Poroi (PAP); Mo'orea, Mt. Tohiewa summit area, 12 Sep 2006, *J.-Y. Meyer 3141*, with R. Taputuarai and E. Poroi (PAP). Epiphytic in cloud forest. Endemic to the Society Islands, previously known only from Raiatea (Copeland, 1932).

***Selliguea plantaginea*** Brack.

Mo'orea, Mt. Tohiewa, 17.55335°S, 149.81854°W, ca. 989 m, 24 Aug 2010, *J. Nitta 657*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Tohiewa, 17.55341°S, 149.81821°W, ca. 949 m, 16 Sep 2008, *J. Nitta 255*, with J.-Y. Meyer, R. Taputuarai, and M. Fourdrigniez (P, PAP, TNS, UC); Mo'orea, Mt. Tohiewa summit area, 13 Sep 2006, *J.-Y. Meyer 3128*, with R. Taputuarai and E. Poroi (PAP); Mo'orea, crête SE du Mt. Tohiewa, 17.55°S, 149.82°W, ca. 1020 m, 22 Oct 1986, *J. Florence 7960* (P, PAP). Epiphytic. Previously known from Sulawesi, New Guinea, Fiji, and various Pacific island groups; in the Society Islands from Tahiti and Huahine (Copeland, 1932; Hovenkamp, 1998).

There has been some confusion between *Selliguea feeoides* Copel. and *S. plantaginea*; according to Hovenkamp (1998), although the name *S. feeoides* has been applied commonly for specimens from the Pacific area, the two differ

by hydathodes of the adaxial surface frequent in *S. feeoides* vs. infrequent or absent in *S. plantaginea*.

## PSILOTACEAE

***Psilotum complanatum* Sw.**

Mo'orea, face of Mt. Tohiea above town of Maatea, 17.55588°S, 149.82289°W, ca. 445 m, 22 Aug 2010, *J. Nitta 642* (P, PAP, TNS, UC); Mo'orea, south side of Mt. Muaroa, 17.54653°S, 149.84776°W, ca. 513 m, 12 Aug 2010, *J. Nitta 575* (P, PAP, TNS, UC); Mo'orea, trail from Belvedere to Three Coconuts, 17.5403°S, 149.8267°W, ca. 251 m, 12 Sep 2008, *J. Nitta 221*, with S. Vinette (P, PAP, TNS, UC); Mo'orea, Haapiti, 4 Jul 1973, *J. Raynal 18039* (PAP; not examined by us); Mo'orea, *J. Vesco s.n.* (PAP; not examined by us); Mo'orea, *G. K. Barclay 3323A* (PAP; not examined by us). Epiphytic. Widespread throughout the Neotropics, Malaysia, and Oceania (e.g., Hawaii); in the Society Islands from Tahiti, Borabora (Copeland, 1932).

## PTERIDACEAE

***Cheilanthes* cf. *nudiuscula* (R. Br.) T. Moore**

Mo'orea, rocky outcropping above town of Papetoai, 17.49824°S, 149.86832°W, ca. 211 m, 19 Aug 2010, *Nitta 619*, with M. Fourdrigniez (P, PAP, TNS, UC); Mo'orea, Temae Rocher à l'extrémité de la chaîne de Paaru Iti, ca. 80 m, 12 Dec 2004, *Butaud 825* with É. Lagouy (PAP; determined as *Cheilanthes tenuifolia* (Burm.) Sw., not examined by us); Mo'orea, Vallée Ouest Papeahi, crête rocheuse menant au trou de Tearai, ca. 488 m, 13 Mar 2005, *Butaud 961* (PAP; determined as *C. tenuifolia*, not examined by us). Previously known from Hong Kong, Australia, the Philippines, Timor, New Caledonia, and Fiji (Chambers and Farrant, 1991); one specimen from Tahiti (*Setchell 75*) at UC.

Material from the Society Islands has historically been called *C. tenuifolia*; *C. nudiuscula* is closely related and may differ in density of laminar hairs (Chambers and Farrant, 1991). Available Mo'orean material was immature and depauperate; additional research is needed to determine which name should be applied.

***Pteris ensiformis* Burm. f. cv. 'Victoriae'**

Mo'orea, road from Vaiare to Paopao, 17.51716°S, 149.81104°W, ca. 69 m, 22 Sep 2008, *J. Nitta 299*, with S. Vinette (P, PAP, TNS, UC). Terrestrial on disturbed road cuts. Widespread, including southern China, the Himalayas, India, Ceylon, Burma, Malaysia, southern Japan, the Ryukyus, Taiwan, the Philippines, Australia, Micronesia, and Polynesia (Shieh, 1994). Introduced.

***Pteris mertensioides* Willd.**

Mo'orea, Mt. Tohiea, 17.55362°S, 149.81644°W, ca. 794 m, 25 Sep 2008, *J. Nitta 325*, with S. Vinette (P, PAP, TNS, UC). Terrestrial. Previously known

from Peninsular Malaysia, the Philippines, New Guinea, Fiji, Samoa, and Tahiti.

SELAGINELLACEAE

***Selaginella laxa*** Spring

Mo'orea, face of Mt. Tohiea above town of Maatea, 17.5567°S, 149.8225°W, ca. 390 m, 14 Sep 2008, *J. Nitta 244*, with S. Vinette (P, PAP, TNS, UC); Mo'orea, Moyenne vallée d' Afareaitu, 1ère cascade, ca. 50 m, 30 Dec 1981, *J. Florence 2228* (PAP; not examined by us). Epipetric on rocks in streams. Historically thought to be widespread in Polynesia (Samoa to the Marquesas).

The type specimen of *S. laxa* is from the Society Islands; however, the conspecificity of material from Hawaii is in doubt.

TECTARIACEAE

***Arthropteris palisotii*** (Desv.) Alston

Mo'orea, Maraarii Valley, 17.52479°S, 149.89342°W, ca. 127 m, 19 Aug 2010, *J. Nitta 618*, with M. Fourdrigniez and P. S. S. Way (P, PAP, TNS, UC); Mo'orea, trail to pass between Mt. Tiura and Mt. Tatiri, 17.53046°S, 149.86578°W, ca. 124 m, 17 Aug 2010, *J. Nitta 607*, with M. Fourdrigniez (P, PAP, TNS, UC); Mo'orea, trail from Vaiare/Paopao pass to Three Pines, 17.52669°S, 149.80777°W, ca. 242 m, 22 Sep 2008, *J. Nitta 303*, with S. Vinette (P, PAP, TNS, UC). Epipetric. Widespread, from tropical Africa to southeastern Asia, Australasia, Malesia, and Fiji (McCarthy and Orchard, 1998).

Previously thought to be closely related to either *Oleandra* (Kramer, 1990) or *Nephrolepis* (Pichi Sermolli, 1977); however, molecular data support inclusion in Tectariaceae (Hasebe *et al.*, 1995; Smith *et al.*, 2006; Tsutsumi and Kato, 2006; Schuettpelz and Pryer, 2007).

***Tectaria decurrens*** (C. Presl) Copel.

Mo'orea, Mt. Mou'aputa, 17.52689°S, 149.80348°W, ca. 807 m, 15 Aug 2010, *J. Nitta 600* (P, PAP, TNS, UC); Mo'orea, face of Mt. Tohiea above town of Maatea, 17.5622°S, 149.8217°W, ca. 197 m, 14 Sep 2008, *J. Nitta 248*, with S. Vinette (P, PAP, TNS, UC); Mo'orea, Mt. Mou'aputa, 28 Aug 2005, *F. Jacq FJ443* (PAP; not examined by us); Mo'orea, moyenne vallée de Maatea, flanc gauche, ca. 220 m, 13 Aug 1983, *J. Florence 4877* (PAP; not examined by us); Mo'orea, moyenne vallée de Maatea, flanc gauche, ca. 130 m, 29 Dec 1981, *J. Florence 2220* (PAP; not examined by us). Terrestrial. Widespread in tropical mainland Asia, the Philippines, New Guinea, in the Pacific eastward to Tahiti (Holttum, 1991).

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

Mo'orea, Mt. Mou'aputa, 17.52689°S, 149.80348°W, ca. 807 m, 15 Aug 2010, *J. Nitta 603* (P, PAP, TNS, UC); Mo'orea, Mt. Mou'aputa, 17.52687°S, 149.80345°W, ca. 789 m, 19 Sep 2008, *J. Nitta 289*, with S. Vinette (P, PAP,

TNS, UC); Mo'orea, Mt. Tohiea, 17.55148°S, 149.82146°W, ca. 1159 m, 24 Sep 2008, *J. Nitta 316*, with S. Vinette (P, PAP, TNS, UC). Terrestrial. Previously known from Taiwan, Indonesia, the Philippines, New Guinea, and in the Pacific east to Tahiti (Holttum, 1991).

#### THELYPTERIDACEAE

##### ***Amphineuron opulentum*** (Kaulf.) Holttum

*Cyclosorus opulentus* (Kaulf.) Nakaike

Mo'orea, road from Vaiare to Paopao, 17.51716°S, 149.81104°W, ca. 69 m, 22 Sep 2008, *J. Nitta 300*, with S. Vinette (P, PAP, UC); Mo'orea, Maharepa, 23 May 2004, *F. Jacq FJ294* (PAP; not examined by us). Terrestrial. Widely distributed; previously known from East Africa, Seychelles, Sri Lanka and southern India, southeastern Asia, throughout Malesia, northeastern Australia, and in the Pacific from the Bonin Islands to New Caledonia and eastward to the Marquesas and the Austral Islands (Holttum, 1977). Widely naturalized in the Neotropics. In the Society Islands, previously known from Tahiti and Raiatea.

##### ***Chingia longissima*** (Brack.) Holttum

*Cyclosorus longissimus* (Brack.) Ching

Mo'orea, valley going up to Mt. Uui from Hauru, 17.50928°S, 149.9046°W, ca. 87 m, 21 Aug 2010, *J. Nitta 620* (P, PAP, TNS, UC); Mo'orea, south side of Mt. Muaroa, 17.54653°S, 149.84776°W, ca. 513 m, 12 Aug 2010, *J. Nitta 576* (P, PAP, TNS, UC); Mo'orea, face of Mt. Tohiea above town of Maatea, 17.5567°S, 149.8225°W, ca. 390 m, 14 Sep 2008, *J. Nitta 246*, with S. Vinette (UC). Terrestrial. Previously known from the Caroline, Solomon, and Marquesas Islands, as well as from Tahiti (Holttum, 1977).

##### ***Coryphopteris* sp.**

Mo'orea, Mt. Tohiea, 17.55332°S, 149.81876°W, ca. 1007 m, 24 Aug 2010, *J. Nitta 663*, with V. Liao and R. Taputuarai (P, PAP, TNS, UC); Mo'orea, Mt. Mou'aputa, 17.5275°S, 149.80313°W, ca. 760 m, 15 Aug 2010, *J. Nitta 593* (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea, 17.55068°S, 149.82233°W, ca. 1045 m, 16 Sep 2008, *J. Nitta 279*, with J.-Y. Meyer, R. Taputuarai, and M. Fourdrigniez (P, PAP, TNS, UC); Mo'orea, Mt. Tohiea summit area, 13 Sep 2006, *J.-Y. Meyer 3136*, with R. Taputuarai and E. Poroï (PAP). Terrestrial; common on ridges above ca. 1000 m. Endemic to Mo'orea pending further study.

The combination of prominent yellow glands on the underside of the lamina and costae with scales but relatively sparse hairs differentiates this species from other *Coryphopteris* from the Society Islands such as *C. pubirachis* var. *tahitensis* Holttum and *C. raiateana* Holttum.

##### ***Plesioneuron* sp.**

Mo'orea, Mt. Mou'aputa, 17.52822°S, 149.80258°W, ca. 678 m, 19 Sep 2008, *J. Nitta 281*, with S. Vinette (P, PAP, TNS, UC). Terrestrial. Endemic to Mo'orea pending further study.

The sole Mo'orean collection of this species differs from *Plesioneuron tahitense* Holttum, endemic to Tahiti, in lacking sporangial setae and the basal pinna lobes only slightly, if at all, reduced. The only other *Plesioneuron* occurring in the Society Islands (Tahiti, Mo'orea) is *P. attenuatum* (Brack.) Holttum, also known from the Bismarck Archipelago and Samoa (Holttum, 1977). This differs by its larger fronds, broader and longer pinnae (to  $25 \times 4$  cm; to  $8 \times 2$  cm in *Nitta 281*) with more oblique and falcate segments, basal segments of at least the distalmost pinnae strongly reduced, persistent stipe base scales, and relatively large, tan indusia.

***Pneumatopteris mesocarpa* (Copel.) Holttum**

*Cyclosorus mesocarpus* (Copel.) Ching

Mo'orea, face of Mt. Tohiea above town of Maatea, 17.5567°S, 149.8225°W, ca. 390 m, 14 Sep 2008, *J. Nitta 245*, with S. Vinette (P, UC). Mo'orea, Mt. Tohiea, 17.55511°S, 149.81454°W, ca. 589 m, 16 Sep 2008, *J. Nitta 249*, with J.-Y. Meyer, R. Taputuarai, and M. Fourdrigniez (P, PAP, TNS, UC). Terrestrial. Previously known only from the Society Islands, including Huahine (Holttum, 1977) and Tahiti.

Closely related *Pneumatopteris glandulifera* (Brack.) Holttum, known from Rarotonga, Samoa, the Solomon Islands, and New Hebrides (Holttum, 1977), may occasionally be confused with *P. mesocarpa*, but differs in absence of indusia.

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