

DESCRIPTIONS*

Lycopodium cernuum L.

Lycopodiaceae

Evergreen ground herb. Stems erect to decumbent, hispidulous, green, c. 1-1.5 mm diameter, upper parts copiously branching. Leaves dense, subulate, rigid, tip acute, margin entire, sparsely strigose; 1-nerved; yellow-green and drying pale yellow-green; c. 3-4 x 0.2-.04 mm. Strobili terminal, pendulous, c. 5-13 x 1.5-2 mm. Sporophylls rhomboid; tip acuminate; base obtuse, prominently strigose, yellow-green and drying pale yellow-green, c. 1.5 x 1 mm. Sporocarps glabrous, pale yellow, c. 0.5 mm diameter. Sporangia glabrous.

Habitat: open soil embankments along a dirt road in severely disturbed, primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 1050 m

Abundance: common

Phenology: fronds: Jan.-Dec.; strobili: April-Dec.

Specimen : Bañoc 55 (1050 m, 17 April 1996)

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* For nine species, only immature or infertile material was found. Descriptions for these are based on CMU Herbarium material. The taxonomic order of descriptions follows that in the Flora of Thailand and the CMU Herbarium.

Selaginella helferi Warb.

Selaginellaceae

Annual ground herb. Stems scrambling, glabrous, grooved, brownish-green and drying stramineous, c. 1-2 mm diameter. Rhizophores brownish-green. Leaves bimorphic. Ventral (larger) leaves on stems slightly thickened, glabrous, distantly spaced, patent, elliptic, tip acute, base slightly oblique, margins white, green above, light-green below, c. 3.2-3.5 x 1.5-2 mm. Dorsal (smaller) leaves on stems slightly thickened, glabrous, adpressed, oblong-lanceolate, tip shortly acuminate, base truncate, margins white, green, c. 2-3 x 1-1.2 mm. Ventral leaves on lateral branches thicker, glabrous, closely spaced, oblong-lanceolate, tip shortly acuminate, base slightly unequally truncate, margins white; green above, light green below; c. 3-4 x 1 mm. Dorsal leaves on lateral branches thicker, glabrous, closely spaced, oblong lanceolate, tip acuminate, base rounded, margins white; green; c. 1-2 x 0.5-0.7 mm. Strobili terminal, 8-15 mm long. Sporophylls monomorphic, oblanceolate, tip long acuminate, base rounded; margins white; c. 2-3 x 1.5-2 mm. Sporocarps glabrous, dark-green, c. 0.8 mm diameter. Sporangia glabrous.

Habitat: partly shaded area in disturbed to slightly disturbed, primary, evergreen, seasonal, hardwood forest, tea plantation; granite bedrock

Elevation: 1000-1240 m

Abundance: common

Phenology: stems, leaves, etc.: June-Dec.; strobili: Sept.-Jan.

Specimen : Bañoc 73 (1100 m, 22 October 1996)

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Selaginella involvens (Sw.) Spring

Selaginellaceae

Evergreen, ground herb, c. 17-27 cm tall. Rhizophores orange-green. Stems erect, glabrous, green and drying stramineous, bearing uniform adpressed leaves in the lower portion; c. 1.5-2 mm diameter. Lateral branches 3x pinnate, scabrous, green. Leaves bimorphic. Ventral (larger) leaves on lateral branches slightly thickened, glabrous, closely spaced, oblong-lanceolate to oblong, tip acuminate, base rounded, margin ciliolate; yellow-green above, light yellow-green below; c.1.5-2 x 1-1.2 mm. Dorsal (smaller) leaves slightly thickened, glabrous, oblong, tip acuminate, base unequally rounded, margins prominently ciliolate; yellow-green above, light yellow-green below; c. 1-1.2 x 0.6-0.8 mm. Strobili terminal, c. 3-4 mm long. Sporophylls monomorphic, oblanceolate, tip acuminate, base rounded, margins ciliolate. Sporocarps glabrous, rounded, light yellow-green, c. 0.5 mm diameter.

Habitat: shaded soil embankment along a flowing stream in primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 1100-1200 m

Abundance: rare

Phenology: stems leaves, etc.: April-Feb.; strobili: June-Feb.

Specimen : Maxwell 95-218 (1200 m, 5 March 1995)*

* : specimen in the CMU Herbarium from Doi Chiang Dao Animal Sanctuary, Chiang Mai Province, in a shaded soil embankment along a flowing stream in seasonal, evergreen hardwood forest and mixed pine + deciduous forest on ridges; granite bedrock

Selaginella minutifolia Spring

Selaginellaceae

Annual, deciduous, ground herb, c. 14-25 cm tall. Rhizophores light pink, c. 1 m diameter. Main stem ascending to erect, glabrous, shallowly grooved, green to light violet and drying light green. Leaves bimorphic. Ventral (larger) leaves thin, glabrous, patent, ovate, tip acute, base unequally rounded, margins sparsely ciliolate, green above, light green below, c. 2-2.5 x 1 mm. Dorsal (smaller) leaves thin, glabrous, elliptic, tip long-acuminate, base rounded, margin shortly and sparsely ciliolate, green above, light green below, c. 1.5-2 x 0.5-1 mm. Strobili terminal, 5-7 mm long. Sporophylls bimorphic. Ventral sporophylls thick, glabrous, oblong-lanceolate, tip acute, base slightly rounded, margin slightly ciliolate, green above, light green below, c. 1.2-1.5 x 0.5-0.8 mm. Dorsal sporophylls thin, glabrous, elliptic, tip long-acuminate, base truncate, margin prominently ciliolate, pale yellow-green, 1-1.3 x 0.5-0.8 mm. Sporocarps rounded, glabrous, pale yellow, c. 0.3 mm diameter. Spores orange.

Habitat: open area in disturbed, primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 1000-1100 m

Abundance: common

Phenology: stems, leaves, etc.: June-Jan.; strobili: Sept.-Dec.

Specimen : Bañoc 74 (1010 m, 22 October 1996)

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Selaginella ostenfeldii Hieron.

Selaginellaceae

Deciduous, annual, ground herb, c. 20-30 cm tall, rhizophores absent. Main stems erect, equally bifid, glabrous, angular, light pink at the base, greenish towards the apex, drying stramineous, c. 9.5-17.5 cm long. Leaves bimorphic. Leaves on the main stem, thin, sparse, adpressed, elliptic, tip acuminate, base rounded, margins ciliolate, white, c. 2 x 0.8-1 mm. Ventral (larger) leaves of lateral branches thin, closely spaced, ascending, oblong-lanceolate, tip acute, base truncate, margins ciliolate, green above, light green below, c. 1.5 x 0.8 mm. Dorsal (smaller) leaves of lateral branches thin, oblong-lanceolate, tip acuminate, base obtuse, margins prominently ciliolate, green, c. 1 x 0.7 mm. Strobili terminal, 0.5-1.4 cm long. Sporophylls monomorphic, ovate, tip acuminate, base broadly truncate, margins prominently ciliolate, light-green, c. 1.5 x 1 mm. Sporocarps glabrous, glossy pale-green, c. 0.8 mm diameter.

Habitat: partly open to open fire damaged area in degraded, deciduous, dipterocarp-oak forest; granite bedrock

Elevation: 600-700 m

Abundance: very common

Phenology: stems, leaves, etc.: May-Jan.; strobili: July-Dec.

Specimen : Bañoc 62 (700 m, 29 August 1996)

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Selaginella repanda (Desv.) Spring

Selaginellaceae

Annual ground herb, c. 8-14 cm tall. Main stems erect, glabrous, light pink and drying stramineous, 0.8-1 mm in diameter. Rhizophores light yellow. Leaves bimorphic. Ventral (larger) leaves on the main stems thin, glabrous, distichous, sessile, spreading, widely spaced, ovate, tip acute, base rounded, margin white, densely ciliate near the base and sparsely ciliate on the upper part, light pink and drying light brown, 2-2.6 x 1.2-1.5 mm. Dorsal (smaller) leaves on the main stems thin, glabrous, sessile, overlapping, ovate, tip acuminate, base rounded, margin white, ciliate, light pink and drying light brown, 1.3-1.6 x 0.7-1.0 mm. Ventral and dorsal leaves on the branches similar to those on the main stem except that they are closely spaced, yellow-green, and dry light green. Strobili terminal, c. 3-4 mm long. Sporophylls monomorphic, obovate, tip long-acuminate, base obtuse, margin ciliate at the base; yellow green. Sporocarps brown.

Habitat: mostly open, fire damaged areas in degraded, dipterocarp-oak and deciduous hardwood forests with much bamboo; granite bedrock

Elevation: 600-750 m

Abundance: common

Phenology: stems, leaves, etc.: Jan.-Nov.; strobili: Aug.-Nov.

Specimen : Bañoc 66 (700 m, 11 September 1996)

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Selaginella roxburghii (Hk. & Grev.) Spring

Selaginellaceae

Annual ground herb, c. 8-12 cm tall. Rhizophores light yellow. Main stem erect, variously branching, glabrous, light yellow, c. 0.5 mm diameter. Leaves bimorphic. Ventral (larger) leaves thin, elliptic, tip acute, base rounded, margins ciliolate, green and drying light green, c. 2 x 1 mm. Dorsal (smaller) leaves thin, ovate, tip acuminate, base rounded, margins ciliolate, green and drying light green, c. 1.5 x 1 mm. Strobili terminal, c. 0.5-1 cm long. Sporophylls monomorphic, thin, oblong, tip acute, base rounded, margins ciliolate, c. 0.8 x 2 mm diameter. Sporocarps glabrous, round, light yellow, c. 0.5 mm diameter. Sporangia orange.

Habitat: partly open, area in relatively disturbed, primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 1125 m

Abundance: common

Phenology: stems, leaves, etc.: May-Jan.; strobili: Sept.-Dec.

Specimen: Bañoc 72 (1125 m, 22 October 1996)

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Equisetum debile Roxb. ex Vauch.

Equisetaceae

Evergreen herb. Roots erect, in coarse alluvial soil along streams, reddish-brown and drying black, 0.3-.05 cm diameter. Stems clustered, erect, striate; green and drying pale green, 1-3.5 mm diameter when dry; sometimes branched, nodes distinct; internodes 10-36 mm long, hollow. Leaves always 9, nodal, whorled, microphyllus, 1-nerved, without chlorophyll, brown and drying blackish, densely pilose, lanceolate; tip acuminate; margins cartilaginous; c. 1-1.5 x 0.5 mm. Strobili terminal, ovoid, green and drying blackish-brown; c. 5-15 x 3.5-4.5 mm. Sporocarps ridged, glabrous, tan to grey, c. 1 mm diameter. Sporangia glabrous, black.

Habitat: open, coarse alluvial soil in and along permanent streams (Nam Mae Lai); degraded, deciduous, hardwood (teak) forest + bamboo; granite bedrock

Elevation: 620-640 m

Abundance: uncommon

Phenology: stems: Jan.-Dec.; strobili: Oct.-Jan.

Specimen : Bañoc 75 (640 m, 30 October 1996)

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Angiopteris evecta (Forst.) Hoffm.

Marattiaceae

Evergreen herb. Rhizome erect, in soil, massive, c. 25 x 36 cm, with a hard lobe on each side of the insertion of the stipes. Scales thick, ovate-lanceolate; tip acute; basifixed, sparsely scabrous, slightly calathrate, dark brown, c. 1.5-2.5 x .5-1 mm. Fronds 2x pinnate, oblong to ovate-oblong; c. 135-271 x 150-170 cm. Stipes glabrous, pale green with whitish streaks, c. 88-152 cm long. Costae glabrous, pale green, c. 47-119 cm long. Pinnae 12, alternate, oblong lanceolate, c. 70-84 x 28-34 cm; stalks c. 5 cm long. Pinnules 40, alternate, coriaceous, glabrous; tip acuminate; base obliquely acute, acroscopic side c. 15°, basiscopic side c. 45°; margin serrate; venation pinnate and forked c. 1/4-1/3 from the costule; green above, pale green underneath; c. 8-10 x 2.3-3 cm; stalks c. 5 mm long. Sori oblong, on all veins, continuous and forming a hive, c. 1 mm from the margin of the pinnules, brown, exindusiate, c. 0.5-0.7 mm diameter. Sporangia glabrous.

Habitat: along a stream in primary, evergreen seasonal, hardwood forest; granite bedrock

Elevation: 750-1165 m

Abundance: rare

Phenology: fronds: Jan.-Dec.; sori: Jan.-Dec.

Specimen: Bañoc 13 (750 m, 21 October 1995)*

* : specimen in the CMU Herbarium from Jae Sawn National Park, Lampang Province, in shaded, wet area along a small creek, mixed evergreen + deciduous seasonal, hardwood forest; shale bedrock

Dicranopteris linearis (Burm. f.) Underw. var. *linearis*

Gleicheniaceae

Evergreen herb. Rhizome creeping in soil, terete, brown, 0.3-0.4 mm diameter. Scales linear, tip acute, basifixed, thin, glabrous, brown, 1.5-2 x 0.2-0.3 mm. Fronds 2-4 times equally dichotomously branched. Stipes terete, glabrous, glossy dark brown and drying castaneous, 50-183 cm long. Costae densely tomentose, greenish-brown and drying stramineous, 11-22 cm long. Pinnules 14-20, equally forked, coriaceous, glabrous above, densely tomentose on the undersurface of the costules and finer veins; tips acute; base truncate; margins lobed nearly to the costules; tips of lobes acute; lowest lobes reflexed, usually larger than the other lobes, serrate; venation in groups of 3 unilaterally branched veins, continuing to the margin or unequally pinnate; yellow-green above, light yellow green underneath; 20-22 x 2-2.5 cm. Sori globose, solitary along the veinlets, c. 0.5 mm diameter; exindusiate. Sporangia glabrous.

Habitat: open soil embankments along a dirt road in severely disturbed primary, evergreen, seasonal, hardwood forest; tea plantation; granite bedrock

Elevation: 900-1000 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: March-Sept.

Specimen: Bañoc 44 (1025 m, 10 May 1996)

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Dicranopteris splendida (Hand.-Mazz.) Tag.

Gleicheniaceae

Evergreen herb. Rhizome creeping in soil, brown, 3-4 mm diameter. Scales linear, tip acute, basifixed, glabrous, brown, 1.5-3 x 0.2-0.3 mm. Fronds unequally, dichotomously branched. Stipes terete, glabrous, glossy brown and drying castaneous, 50-60 cm long. Costae terete, 15-25 cm long. Pinnae several times branched, glabrous, coriaceous; segment tips acute; margins lobed nearly to the costules, lowest lobes reflexed, usually larger than the other lobes; venation distinct, pinnate, free, reaching the margin; green and drying yellow-green above, light green and drying bright yellow-green underneath; c. 21-29 x 7-8 cm. Sori globose, solitary along the veinlets, c. 0.5 mm diameter; exindusiate. Sporangia glabrous.

Habitat: open soil embankments along a dirt road in severely disturbed, primary, evergreen, seasonal, hardwood forest; tea plantation; granite bedrock

Elevation: 900 - 1100 m

Abundance: common

Phenology: fronds: Jan. - Dec.; sori: March - Sept.

Specimen: Bañoc 53 (1050 m, 17 April 1996)

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Lygodium flexuosum (L.) Sw.

Schizaeaceae

Evergreen herb. Rhizome creeping in soil, brown with a few coarse roots, c. 3.5 x 0.5 cm. Fronds 2-3x pinate, closely spaced, climbing, twining, c. 1.5-2 m long. Axes sparsely pilose, green and drying stramineous above, light green and drying stramineous underneath. Pinnae alternate, oblong, c. 34 x 18 cm; stalks c. 3 cm long. Pinnules 11, alternate, thin, sparsely pilose, oblanceolate to lanceolate, tips rounded to acute, base cordate, margins finely serrulate; venation pinnate, 3x forked; dark-green and drying brownish-green above, green and drying light brownish-green below; c. 9 x 2 cm; stalks c. 1-5 mm long. Sori oblong, on marginal lobes of the lower 2/3 of pinnules, c. 2x 1 mm. Indusia thick, in two rows, sparsely scabrous, brown, c. 0.5 mm diameter each. Sporangia glabrous.

Habitat: open fire damaged area, degraded, disturbed, deciduous, dipterocarp-oak forest; also found in primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 600-1020 m

Abundance: very common

Phenology: fronds: Jan.-Dec.; sori: March- Dec.

Specimen : Bañoc 52 (1020 m, 16 April 1996)

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Cibotium barometz (L.) J. Smith

Dicksoniaceae

Evergreen herb. Rhizome erect, in soil, top at ground level, up to c. 7 cm diameter. Scales dense, soft, lanceolate, tip long acuminate, base rounded, peltate, margins strigose, prominently calathrate, golden-brown, 7-16 x 0.2-0.5 mm. Fronds 2x pinnate, ovate-lanceolate, c. 247-349 x 140 cm. Stipes grooved, scaly at the base, otherwise glabrous, dark reddish-brown and drying stramineous, c. 140-179 cm long. Costae glabrous, dark reddish-brown and drying stramineous, c. 107-170 cm long. Pinnae 18-24, alternate, stalks c. 2 cm long. Pinnules more than 70, alternate, chartaceous, glabrous except on the costules and veinlets which are sparsely tomentose, lanceolate; tip acuminate; base truncate; margins deeply lobed nearly to the costules; tips of lobes acute, venation pinnate and forked half way from the costules; green above, light green below and drying brownish-green; c. 10 x 1.5 cm; stalks c. 1 mm long. Sori solitary at the base of the lobes. Indusia thick, globose, 2-valved, pale green and drying brown; c. 0.5 mm diameter. Sporangia glabrous, brown.

Habitat: partly open area along a permanent stream in primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 900-1200 m

Abundance: rare

Phenology: fronds: Jan.-Dec.; sori: Jan.-Dec.

Specimen : Bañoc 56 (1080 m, 17 April 1996)

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Microlepia speluncae (L.) Moore

Dennstaedtiaceae

Evergreen herb. Rhizome creeping in soil, pale brown to brown, c. 2.5 cm diameter. Roots wiry, brown. Scales linear; tip acute; basifixed, glabrous, thin, light brown, 1-2 x 0.3 mm. Fronds 3x pinnate, ovate-lanceolate, 140-222 x 82-96 cm. Stipes grooved, densely tomentose at the base, otherwise glabrous, reddish-brown and drying stramineous, 62-79 cm long. Costae sparsely tomentose, light reddish-brown and drying brown, 78-143 cm long. Pinnae 10-15 + terminal segment, alternate, stalks c. 1-4 cm long, thin, densely tomentose, oblong to lanceolate; tips acuminate. Primary pinnules 40-50 + terminal segment, alternate, stalks c. 1-2 mm long, oblong-lanceolate; tips acuminate. Secondary pinnules 18-20 + terminal segment, alternate, sessile, thin, densely tomentose, oblong; tips rounded; base slightly cuneate; margins shallowly lobed; venation pinnate; yellow-green above, very light yellow-green below; 0.5-0.8 x 1-1.5 cm. Sori round, solitary, sub-marginal. Indusia cup-shaped, concealing the sporangia, tomentose, pale brown; c. 0.5 cm diameter. Sporangia glabrous.

Habitat: partly open, disturbed area, tea plantation in primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 900-1200 m

Abundance: rare

Phenology: fronds: Jan.-Dec.; sori: Feb.-Dec.

Specimen : Bañoc 46 (1140 m, 17 April 1996)

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Pteridium aquilinum (L.) Kuhn ssp. *aquilinum* var. *wightianum* (Ag.) Tryon

Dennstaedtiaceae

Robust, often dense, evergreen herb. Rhizome deep, creeping in soil, c. 1 cm diameter, dark brown outside, green inside, covered with very narrow scales. Scales thin, linear; tip acute, basifixed, glabrous, golden-brown, 1.5-2 x 0.1 mm. Fronds 2x pinnate, deltoid, c. 135-352 x 100-120 cm. Stipes glabrous, grooved, light green and drying light brown, 55-160 cm long. Costae light yellow-green and drying stramineous, 80-192 cm long. Pinnae 5 pairs + terminal segment, sub-opposite, with c. 0.5-2 cm stalks, coriaceous, densely pilose, ovate-lanceolate; 50-60 x 14-18 cm. Pinnules 45-59 + terminal segments, alternate, sessile, oblong to lanceolate, pilose; tips acuminate; base oblique, acroscopic side c. 5°, basiscopic side c. 45°; margins lobed c. 5/6 to the costule; tips of lobes acute; venation free, dark green above, light green below; c. 8-11 x 1-1.5 cm. Sori linear, continuous along the margin of each lobe, nearly reaching the lobe tips. Indusia thin, linear, from the reflexed edge of the lobes, pale green and drying pale brown, covering the sori. Sporangia glabrous

Habitat: open, very disturbed areas along a dirt road in degraded, primary, evergreen, seasonal, hardwood forest; tea plantation; granite bedrock

Elevation: 1070-1125 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: Jan.-June

Specimen: Bañoc 34 (1070 m, 9 April 1996)

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Lindseae ensifolia Sw. ssp. *ensifolia*

Lindseaceae

Evergreen herb. Rhizome creeping in soil, brown, c. 3-4 mm diameter. Scales thin, linear, tips acuminate, basifixed, glabrous, prominently calathrate, light brown, c. 1.5-2 x 0.3 mm. Fronds once pinnate, obovate, c. 41 x 30 cm. Stipes grooved, glabrous, brownish-green and drying light brown, c. 28 cm long. Costae grooved, glabrous, brownish-green and drying stramineous. Pinnae 7, sub-opposite, thin, glabrous, linear, tip acuminate, base acute, margin entire; venation reticulate; dark green and drying green above, green and drying light green underneath; c. 17-18.5 x 1.5-2 cm; stalk c. 3 mm long. Sori linear, continuous along the margins of the pinnae. Indusia thin, opening towards the margin, glabrous, pale green, c. 0.5 mm wide. Sporangia glabrous.

Habitat: shaded areas in primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 1000-1125 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: Jan-Dec.

Specimen: Bañoc 44 (1125 m, 9 May 1996)

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Sphenomeris chinensis (L.) Maxon var. *chinensis*

Lindseaceae

Evergreen herb. Rhizome short-creeping in soil, brown. Scales thin, linear, tip long acuminate, basifixed, brown, 1.5-3 x 0.1-0.2 mm. Fronds 3x pinnate, oblong, 58-71 x 20 cm. Stipes glabrous, light-yellow green and drying stramineous, 23-32.5 cm long. Costae glabrous, light-yellow green and dying stramineous, 35-39 cm long. Pinnae 30 + terminal segment, alternate, thin, glabrous, finely divided, oblong, c. 10-15 x 4-7 cm; stalk c. 3-4 mm long. Pinnules 5-6 + terminal segment, alternate, sessile, 2-3 times deeply lobed, tips of lobes obliquely linear to rounded; venation linear and forked c. $\frac{1}{3}$ from the base to tip of lobes; light green and drying brownish-green; c. 7 x 5 mm. Sori in between 2 nerves at the lobe tips. Indusia thin, opening towards the margin of the lobes, blackish-green, c. 0.5 mm diameter. Sporangia glabrous.

Habitat: open, very disturbed soil embankment along a dirt road in primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 1000-1050 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: Jan.-Dec.

Specimen : Bañoc 37 (1025 m, 10 May 1996)

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Davallia trichomanoides Bl. var. *lorrainii* (Hance) Holtt.

Davalliaceae

Deciduous, perennial, epiphytic or epilithic herb. Rhizome creeping, blackish-brown, c. 5 mm diameter. Scales dense, ovate-lanceolate, tip long acuminate, base round, peltate, sparsely strigose, base brown, upper part blackish brown, 5.5-6.5 x 0.2-.03 mm. Fronds 3x pinnate, ovate-oblong, c. 39-50 x 28 cm. Stipes glabrous, brownish-green and drying stramineous, 10-14.5 cm long. Costae glabrous, brownish-green and drying stramineous, 29-35 cm long. Pinnae 24 + terminal segment, alternate, coriaceous, glabrous, ovate-oblong, c. 14-20 x 6-11 cm; stalk c. 5 mm long. Pinnules 8 + terminal segment, oblong, lobed c. 1/2-2/3 towards the costule; tip of lobes acute; venation pinnate; green and drying light green to stramineous above, light-green and drying stramineous below. Sori solitary, c. 0.5-1 mm from the tip of lobes. Indusium tubular, glabrous, light green to pale brown, c. 1 mm diameter. Sporangia totally covered by each indusium.

Habitat: partially shaded area in very disturbed, primary, evergreen, seasonal, hardwood forest, tea plantation; granite bedrock

Elevation: 1000-1150 m

Abundance: common

Phenology: fronds: April-Dec.; sori: June-Oct.

Specimen : Bañoc 36 (1025 m, 21 May 1996)

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Leucostegia immersa Presl

Davalliaceae

Deciduous, perennial, epilithic herb. Rhizome long-creeping, green and drying black, 7-9 mm diameter. Scales dense, ovate, tip acute, base round peltate, sparsely strigose, light brown, 2-3.5 x 1-2 mm. Fronds 3x pinnate, obovate, c. 41-49 x 15-16 cm. Stipes glabrous, sparsely scaly, green, drying stramineous, 14-17 cm long. Costae glabrous, green, drying stramineous, 27-32 cm long. Pinnae 20 + terminal segment, alternate, thin, glabrous, oblong to ovate-oblong, c. 8-12 x 4-6 cm; stalk c. 6-10 mm long. Pinnules 8 + terminal segment, alternate, sessile, ovate, tip emarginate, base connate; margins lobed c. $\frac{4}{5}$ to the costule; tips of lobes emarginate; venation pinnate, forked, veins all free; green on both surfaces and drying light green; c. 7-10 x 4-5 mm. Sori sub-orbicular, solitary in between distal veins c. 1 mm from the tip of the lobes. Indusia glabrous, orbicular, basifixed, pale green and drying pale brown, c. 1 x 0.5 mm. Sporangia glabrous.

Habitat: shaded to partly opened area on rock near a stream or in less disturbed, primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 1120-1160 m

Abundance: rare

Phenology: fronds: April-Dec.; sori: June-Oct.

Specimen : Bañoc 82 (1160 m, 23 Oct. 1996)

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Nephrolepis delicatula (Dcne.) Pichi-Ser.

Oleandraceae

Deciduous, perennial, epiphytic or epilithic herb. Rhizome erect, brown. Roots with tubers about 0.5 cm diameter. Scales sparse, thin, triangular; tip long acuminate; base rounded, peltate, sparsely strigose, prominently calathrate, thin, light brown, 2-3.5 mm x 0.3-0.8 mm. Fronds once pinnate, linear-lanceolate, 37-50 x 3.5-5 cm. Stipes grooved, glabrous, brownish-green, drying stramineous, 6-11 cm long. Costae grooved, glabrous, brownish-green and drying stramineous, 31-39 cm long. Pinnae 60-85, alternate, sessile, thin, glabrous, linear-lanceolate; tip acute; base asymmetric; margins serrate; venation pinnate, forked c. 1/3 from the costule; green above, pale-green below; c. 1.5-3 x 0.3-0.6 mm. Sori round, solitary, always at the ends of the 2nd forked veins, c. 0.5-1 mm from the margins. Indusia reniform, basifixed, glabrous, brown, c. 0.5 mm diameter. Sporangia glabrous.

Habitat: partly shaded areas on tree trunks in fire prone, very degraded, deciduous, dipterocarp-oak forest; also seen on rocks in primary, evergreen seasonal, hardwood forest; granite bedrock

Elevation: 600-1160 m

Abundance: common

Phenology: fronds: May-Dec.; sori: June-Dec.

Specimen : Bañoc 60 (650 m, 29 August 1996)

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Oleandra undulata (Willd.) Ching

Oleandraceae

Deciduous, perennial, ground or epilithic herb. Rhizome long-creeping brown, c. 5-6 mm diameter. Scales dense, thin, ovate; tip acute; base broadly cordate, peltate, prominently sericeous, light brown, c. 4 x 1-1.2 mm. Fronds simple, closely spaced, glabrous. Stipes grooved, sparsely puberulous, castaneous and drying stramineous, c. 12.5-14 cm. Laminae sub-coriaceous, linear to lanceolate; tip acuminate; base obtuse; margins undulate, glabrous dorsally, hirsute ventrally; venation parallel, forked c. 1 mm from the costa; green above, light green underneath; c. 30-38 x 3-4 cm. Sori round, solitary along veins, c. 1-3 mm from the costa, appearing as one row on each side of the costa. Indusia thin, orbicular, hirsute, pale green, c. 1-1.5 mm diameter. Sporangia glabrous.

Habitat: shaded areas in severely disturbed, primary, evergreen, seasonal, hardwood forest, tea plantation; granite bedrock

Elevation: 1050-1100 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: June-Oct.

Specimen : Bañoc 58 (1050 m, 3 July 1996)

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Adiantum philippense L.

Parkeriaceae

Deciduous perennial herb. Rhizome short, creeping in soil, black; c. 3-5 mm diameter. Scales thick, linear, tips acuminate, basifixed, margins slightly ferruginous, glossy black medially, 2-3 0.2 mm. Fronds once pinnate, oblanceolate, c. 35-48 x 6-8 cm, proliferous at the tips. Stipes glabrous, grooved, glossy castaneous, 16-27 cm long. Costae glabrous, glossy castaneous, 17-19 cm long. Pinnae 21, alternate, thin, glabrous, asymmetrically elliptic, base truncate, margins entire to very slightly lobed; venation 3x forked, veins all free; pale green and drying brownish-green above, very pale green and drying light brownish-green below; stalks 0.5-2 cm long. Sori linear, along the margin, c. 0.5-2 cm long. Indusia thin, glabrous, linear, from reflexed margin of lobes, pale green. Sporangia glabrous.

Habitat: partly open area both in deciduous, dipterocarp-oak and primary, evergreen, seasonal, hardwood forests; granite bedrock

Elevation: 500-1130 m

Abundance: very common

Phenology: fronds: April-Dec.; sori: July-Oct.

Specimen : Bañoc 7 (550 m, 20 Oct. 1995)

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Adiantum zollingeri Mett. ex Kuhn

Parkeriaceae

Deciduous perennial herb. Rhizome short, erect, in soil, brown, c. 0.5 mm diameter. Scales thickened, ovate-lanceolate, tip acuminate, base rounded, peltate, glabrous, slightly calathrate, margins thin and light brown, dark brown medially, c. 4-5 x 0.3-0.9 mm. Fronds once pinnate, oblanceolate, 32-53 x 2.5-3 cm, proliferous at the tips. Stipes densely pilose, dark brown and drying castaneous, 5.5-9.5 cm long. Costae densely pilose dorsally, sparsely pilose ventrally, dark brown and drying castaneous, c. 27-41 cm long including the proliferous tips. Pinnae 85, alternate, sessile, thin, puberulous, very dimidiate, asymmetrically elliptic; tip somewhat rounded; base somewhat right angular, basispic side c. 90° from the costa or slightly ascending, acroscopic side c. 5° or parallel to the costa; lower pinnae slightly reduced, reflexed, widely spaced; margins lobed c. 1/2 towards the costule; venation parallel, forked 1/2 way towards the tip; green and drying dark brown above, light green and drying brown below. Sori on apices of lobes, c. 1 mm long. Indusia thin, linear, from reflexed margin of lobes, pale brown. Sporangia glabrous

Habitat: partly shaded area in a tea plantation, primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 400-1100 m

Abundance: common

Phenology: fronds: April-Dec.; sori: June-Oct.

Specimen : Bañoc 45 (1060 m, 16 April 1996)

Cheilanthes belangeri (Bory) C. Chr.

Parkeriaceae

Deciduous perennial herb. Rhizome erect, in soil, bearing a tuft of fronds. Scales linear-lanceolate; tip acuminate; basifixed, sparsely strigose, thick, glossy brown, 2-3 mm x 0.1-0.2 mm. Fronds once pinnate, linear to lanceolate, 14-24 x 3.5-6 cm. Stipes sparsely strigose, scaly at the base, grooved, glossy castaneous, c. 2.5-11.5 cm long. Costae sparsely strigose, grooved, glossy castaneous, c. 10-23 cm long. Pinnae 24-31 + terminal segment, alternate, glabrous, sub-coriaceous, linear to lanceolate; tips acute; base oblique, acroscopic side c. 10° , basiscopic side c. 45° ; margins lobed nearly to the costules; tips of lobes rounded; venation pinnate; green above, light green below; c. 1.5-4.5 x 0.5-1.5 cm; stalks c. 1-4 mm long. Sori continuous along the margins of the lobes. Indusia from reflexed margins of the lobes, glabrous, pale green. Sporangia glabrous.

Habitat: open, disturbed, primary, evergreen, seasonal, hardwood forest; tea plantation; granite bedrock

Elevation: 1100 m

Abundance: rare

Phenology: fronds: June-Dec.; sori: July-Dec.

Specimen : Bañoc 65 (1100 m, 17 July 1996)

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Cheilanthes formosana (Forssk.) Kaulf.

Parkeriaceae

Deciduous epilithic herb. Rhizome erect, brown outside, pale green inside, 0.4-0.5 mm diameter. Scales linear-lanceolate; tip acuminate; basifixed, sparsely scabrous, dark brown with brown edges, 5-8 x 0.2-0.8 mm. Fronds once pinnate, ovate-lanceolate, 62-77 x 14-25 cm. Stipes glabrous, terete, glossy castaneous, 37-45 cm long. Costae glabrous, grooved dorsally, glossy castaneous, 25-32 cm long. Pinnae 26-32 + terminal segment, alternate, sessile, sub-coriaceous, glabrous linear; tips acuminate; base oblique, acroscopic side c. 10° , basiscopic side c. 45° ; margins lobed nearly to the costules; tips of lobes rounded to acute; venation pinnate, veinlets forking with the 2 branches continuing to the sinus, free; green above, with silvery farina underneath, drying brownish- green above, pale green below; c. 5-11 x 1-4 cm.; basal acroscopic pinnules largest, c. 8-9.5 x 1 -1.5 cm. Sori continuous along the margin of each lobe. Indusia from reflexed pinnae lobe margins, pale green, 0.5-1 mm diameter. Sporangia glabrous.

Habitat: partly open area along a permanent stream in primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 1160-1180 m

Abundance: rare

Phenology: fronds: Jan.-Dec.; sori: Aug.-Dec.

Specimen : Bañoc 83 (1160 m, 23 Oct. 1996)

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Cheilanthes tenuifolia (Burm. f.) Sw.

Parkeriaceae

Deciduous perennial herb. Rhizome creeping in soil, brown; roots stiff. Scales thin, linear, tip acuminate, basifixed, glabrous, very pale brown, c. 2.5-3.5 x 0.1-0.15 mm. Fronds 3x pinnate, ovate-lanceolate, c. 31-66.5 x 8-10 cm. Stipes sparsely strigose, glossy castaneous, 23-40 cm long. Costae sparsely strigose, grooved, glossy castaneous, c. 8-26.5 cm long. Pinnae 10-25, lowest few pairs sub-opposite, otherwise alternate; thin, sparsely strigose. Pinnules 15-20, linear-lanceolate, tip rounded, base decurrent, margins dentate; venation pinnate, forking c. $\frac{1}{3}$ of the way from the costule. Sori continuously linear along the margin of the lobes. Indusia from reflexed lobe margins, pale green, glabrous; 1-5 mm long. Sporangia glabrous.

Habitat: open area in degraded, fire-damaged, seasonal deciduous dipterocarp-oak forest often with bamboo; granite bedrock

Elevation: 600-700 m

Abundance: common

Phenology: fronds: Aug.-Dec.; sori: Sept.-Dec.

Specimen : Bañoc 59 (650m, 29 August 1996)

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Pteris biaurita L.

Pteridaceae

Evergreen herb. Rhizome short, erect, in soil, brown, c. 1 cm diameter. Roots fibrous, brown. Scales thick, ovate-lanceolate, tip acute; base rounded, peltate, strigose, indistinctly calathrate, ferruginous on both sides, glossy black medially; 2-3 x 0.5-0.8 mm. Fronds once pinnate, ovate, c. 77-152 x 20-30 cm. Stipes grooved, glabrous, brownish-green to green and drying stramineous, 46.5-90 cm long; base scaly. Costae grooved, glabrous, light green to green and drying stramineous. Pinnae 13, opposite to sub-opposite, coriaceous, glabrous, lanceolate; tip long-acuminate; base obliquely acute, acroscopic side parallel to costa or sometimes overlapping the costa, basispic side c. 45°; sessile, margins deeply lobed c. $\frac{7}{8}$ towards the costule; tip of lobes rounded to acute; venation pinnate, forked at the upper 1.5 mm from the main vein, with a pair of basal veins uniting below each rounded sinus; green and drying greenish-brown above, light green and drying light brown below; basal pinnae with long basispic pinnules similar to the lateral pinnae; c. 15-18 x 3-4 cm. Sori linear, along the margin of the lobes, c. 1-1.7 cm long. Indusia thin, linear, glabrous, opening towards the costule, pale green, covering the sori. Sporangia glabrous.

Habitat: partly shaded area, near a perennial stream; in disturbed, primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 900-1165 m

Abundance: common

Phenology: frond: Jan.-Dec.; sori: March-July

Specimen : Bañoc 51 (1020 m, 16 April 1996)

Pteris decrescens Christ

Pteridaceae

Evergreen herb. Rhizome shortly creeping in soil. Roots brown. Scales thin, linear; tip acute; base rounded, peltate, slightly strigose, slightly calathrate, ferruginous on both sides, dark brown medially, 3-4 x 0.2-0.3 mm. Fronds once pinnate, obovate, 39.5-82.5 x 15-20 cm. Stipes grooved dorsally, glabrous, glossy brown and drying castaneous, 14-33.5 cm long. Costae grooved dorsally, slightly pilose, dark brown and drying castaneous, 25.5-49 cm long. Pinnae 10-12, alternate, sub-coriaceous, glabrous dorsally, sparsely scabrous ventrally, especially on costules and veins, lanceolate, tip long-acuminate, base obliquely acute, acroscopic side c. 5°, basiscopic side c. 40°; sessile, upper pinnae the longest; margins deeply lobed, nearly to the costules, tips of lobes rounded; venation parallel and forking half-way towards the margin; green and drying brownish-green above, light green and drying greyish-green below; 12-16 x 3-3.5 cm. Sori linear, continuous along the lower $\frac{2}{3}$ of both margins from the costa nearly to the tip of each lobe. Indusia thin, linear, margin sparsely strigose, opening towards the costule, light green, c. 1 cm long. Sporangia glabrous.

Habitat: shaded, disturbed, primary, evergreen, seasonal, hardwood forest, tea plantation; granite bedrock

Elevation: 900-1100 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: March-Dec.

Specimen : Bañoc 41 (1075 m, 9 May 1996)

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Pteris heteromorpha Fee

Pteridaceae

Evergreen herb. Rhizome erect, in soil, brown, c. 1 cm diameter. Scales thick, linear; tip acuminate, basifixed, sparsely strigose, ferruginous on both sides, glossy, black medially, c. 3-5 x 0.1-0.3 mm. Fronds once pinnate, elliptic, 27-41.1 x 18-20 cm. Stipes angular, glabrous, brown and drying stramineous to castaneous, 14-27.1 cm long. Costae sparsely puberulous, brown and drying stramineous, 13-14 cm long. Pinnae 9-11, opposite to sub-opposite, sub-coriaceous, glabrous except on the costules which are sparsely puberulous, linear-lanceolate to irregularly and unequally lobed; tip acute; base acute, acroscopic side c. 10°, basiscopic side c. 50°; sessile or on stalks c. 1 mm long, venation parallel, and forked half way to the costules; dark green and drying pale green above, light green and drying pale green below. Sori linear, continuous along the margin except at the base and the c. upper 1/3 of the pinnae. Indusia thin, opening towards the costule, pale green. Sporangia glabrous.

Habitat: partly shaded, very disturbed, primary, evergreen, seasonal, hardwood forest;
granite bedrock

Elevation: 1000-1165 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: March-Sept.

Specimen : Bañoc 42 (1075 m, 9 May 1996)

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Pteris venusta Kunze

Pteridaceae

Evergreen herb. Rhizome creeping in soil, black outside, brownish-green inside, c. 1 cm diameter. Scales thick, oblanceolate, tip long-acuminate, basifixed, brown, 1-2 x 0.5-1 mm. Fronds once pinnate, broadly ovate, c. 53-66 x 25-30 cm. Stipes angular, glabrous, brownish-green and drying brown, 41-45 cm long. Costae glabrous, brownish-green and drying brown, 12-21 cm long. Pinnae 9-11, opposite, sub-coriaceous, glabrous, linear; tip long-acuminate, base slightly cuneate; margins slightly crenate; sessile or on stalks up to c. 5 mm long, venation parallel; glossy dark green and drying green above, green and drying light green underneath; 22-28 x 2.7-3 cm. Sori linear, continuous along the margins except at the base and at the tip of the pinnae. Indusia thin, linear, opening towards the costule, pale green. Sporangia glabrous.

Habitat: moist, shaded gully in disturbed, degraded, deciduous hardwood (former teak) + bamboo forest; granite bedrock

Elevation: 600-700 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: Feb.-Aug.

Specimen : Bañoc 90 (600 m, 27 October 1996)

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Asplenium excisum Presl

Aspleniaceae

Evergreen herb. Rhizome shortly creeping in soil, brownish green, c. 5-8 mm diameter. Scales ovate-lanceolate; tip acuminate; base rounded, basifixed, sparsely strigose, dark brown, 5-7 x 0.4 mm. Fronds once pinnate, ovate-lanceolate, 23-31 x 7-10 cm. Stipes scaly, dark green and drying blackish; 12-14 cm long. Costae sparsely scaly, dark green and drying blackish; 12-17 cm long. Pinnae 16-19 + terminal segment, sub-opposite to alternate, ovate, sub-coriaceous; tip rounded; base oblique, dimidiate, acroscopic side c. 25°, basiscopic side c. 60°; margins deeply lobed, nearly to the costule; tips of lobes rounded; venation pinnate; dark green above, green below; 4-5 x 2-3 cm; stalks c. 1-3 mm long. Sori linear, solitary on the veins, c. 0.8-2 cm long. Indusia linear, thin, basifixed, pale brown, 1-2 cm long. Sporangia glabrous.

Habitat: open, perennial stream in primary evergreen, seasonal, hardwood forest; falls area; granite bedrock

Elevation: 900-1200 m

Abundance: rare

Phenology: fronds: Jan.-Dec.; sori: Jan.-Dec.

Specimen: Bañoc 84 (1020 m, 16 April 1996)

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Asplenium nidus Hk. var. *nidus*

Aspleniaceae

Evergreen, epiphytic or epilithic, herb. Rhizome erect, brown outside, pale green inside, 5-10 mm diameter, with a dense, tangled, brown root mass. Scales dense, linear-lanceolate; tip long acuminate; basifixed, prominently villous and calathrate, translucent in the lower 3/4, dark brown above, 5.5-9 x 0.8-1.2 mm. Fronds simple, radially arranged. Stipes 2-4 cm long. Laminae linear to lanceolate, glabrous, coriaceous; tip acuminate; base long attenuate; margins slightly undulate; venation pinnate, once or twice forked, the first forking near the midrib and then running parallel and uniting at the apex to form a submarginal vein, c. 1 mm from the margin; green dorsally and light green ventrally; 51-58 x 5-6 cm; stipes c. 2-4 cm long. Sori linear, along the veins, c. 1 mm from the costa to half way towards the margin, usually on each veinlet of the upper half of the lamina to 3.5-5 cm from the tip. Indusia thin, linear, glabrous, c. 0.8-1 mm diameter. Sporangia glabrous.

Habitat: shaded, wet places along the river bank in primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 1100-1160 m

Abundance: rare

Phenology: fronds: Jan. - Dec.; sori: Sept.-Dec.

Specimen: Bañoc 81(1130 m, 23 Oct. 1996)

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Asplenium obscurum Bl.

Aspleniaceae

Evergreen herb. Rhizome creeping on rocks (epilithic), green, 3-5 mm diameter. Scales acicular; tip aristate; base rounded, sparsely strigose, prominently calathrate, dark brown, 2-4 x 0.1 - 0.3 mm. Fronds once pinnate, linear, 40-64 x 7-10 cm. Stipes glabrous, dark green and drying castaneous, 15-19 cm. Costae glabrous, dark green and drying castaneous, 20-25 cm. Pinnae 60-64 + terminal segment, alternate, well-spaced, sub-coriaceous, glabrous, slightly falcate, very dimidiate; tip acute; base acute; margins slightly serrate; venation parallel, mostly once-forked; dark green and drying yellow-green above, light green and drying pale yellow green underneath; 3-5 x 0.7-1 cm; stalks c. 1 mm long. Sori linear, solitary on a forked veins; 1.5-3 mm long. Indusia linear, thin, basifixed, glabrous, pale brown; 1.5-4 mm long. Sporangia glabrous.

Habitat: shaded, perennial stream in primary, evergreen, seasonal, hardwood, forest; falls area; granite bedrock

Elevation: 900 - 1200 m

Abundance: rare

Phenology: fronds: Jan. - Dec.; sori: Jan.- Dec.

Specimen: Bañoc 48 (1020 m, 16 April 1996)

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Blechnum orientale L.

Blechnaceae

Evergreen herb. Rhizome erect, in soil, brown, c. 35 x 5 cm. Scales dense, thick, linear; tip long-acuminate; base round, peltate, margins ferruginous, glossy dark brown, calathrate, 12-17 x 0.8-1.8 mm. Fronds once pinnate, oblong to lanceolate, c. 117-135 x 50-65 cm. Stipes glabrous, densely scaly at the base, brownish to purplish and drying stramineous, 40-42 cm long. Costae glabrous, light brownish-green and drying stramineous, 77-93 cm long. Pinnae c.115, alternate, sessile, coriaceous, glabrous, lanceolate; tip acuminate; base cuneate; venation parallel; green and drying brownish-green above, light green and drying stramineous underneath. Sori linear, continuous along most of the costules; exindusiate. Sporangia glabrous, brown.

Habitat: open, very disturbed, soil embankment along a dirt road in degraded primary, evergreen, seasonal, hardwood forest; tea plantation; granite bedrock

Elevation: 900-1050 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: April-Aug.

Specimen : Bañoc 43 (1025 m, 10 May 1996)

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Brainea insignis (Hk.) J. Sm.

Blechnaceae

Evergreen herb. Rhizome erect, in soil, blackish, c. 70 x 11 cm. Scales dense, linear; tip acuminate; basifixed, glabrous, thin, prominently calathrate, brown, c. 12-16 x 1-1.2 mm. Fronds in a close whorl on the tip of the rhizome, once pinnate, oblong to lanceolate, c. 70 x 22 cm. Stipes glabrous, dull light green and drying stramineous, c. 14 cm long. Costae glabrous, dull light green and drying stramineous, c. 56 cm long. Pinnae c. 95, alternate, sessile, coriaceous, glabrous, linear-lanceolate; tips acuminate; base slightly cordate; margins serrate; venation parallel, forked; dull dark green above, pale light green below; 9.5 x 0.7 cm. Sori linear, continuous along each side of the costule; exindusiate. Sporangia glabrous.

Habitat: shaded areas in slightly disturbed, primary, evergreen, seasonal, hardwood forest; granite bedrock.

Elevation: 1125 m

Abundance: very rare

Phenology: fronds: Jan. Dec.; sori : Jan.-Dec.

Specimen: Maxwell 96-124 (1425 m, 28 January 1996)*

* : specimen in the CMU Herbarium from Doi Chiang Dao Wildlife Sanctuary, Chiang Mai Province

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Bolbitis sinensis (Bak.) K. Iwats. var. *sinensis*

Lomariopsidaceae

Evergreen herb. Rhizome creeping on rocks close to the ground, brown, c. 1 cm diameter. Scales ovate-lanceolate; tip shortly acuminate, base round, peltate, strigose, prominently calathrate, dark brown, 3-5 x 0.5-0.8 mm. Fronds once pinnate, bimorphic. Sterile fronds oblong to lanceolate, c. 38-47 x 18-22 cm; stipes sparsely scaly, green and drying brownish-green, c. 38-47 cm long; costae glabrous, green and drying brownish-green, c. 8-11 cm long; pinnae 24 + terminal segment, sub-opposite to alternate, thin, glabrous, oblanceolate, tip long acuminate, base slightly oblique to slightly obtuse, acroscopic side c. 15°, basiscopic side c. 30°, margins lobed c. 1/2-2/3 to the costule, tips of lobes rounded to acute; venation pinnate, veins free; dark green and drying blackish green above, light green and drying light green below, proliferous below the tip; c. 10-12 x 2.5-3 cm; stalks c. 0.5 mm long. Fertile fronds oblong to lanceolate, c. 65-74 x 6 cm; stipes sparsely covered with brown scales, more densely so at the base; dark green and drying brown; 35-39 cm long; costae glabrous, dark green and drying dark brown; c. 30-35 cm long; pinnae 26, sub-opposite to alternate, thin, lanceolate; tip acute; margins of first 2 pairs shallowly lobed. Sori acrostichoid, covering the lower surface, brown; stalks c. 1 mm long; exindusiate. Sporangia glabrous.

Habitat: partly shaded area near a stream in primary, evergreen, seasonal, hardwood forest, tea plantation; granite bedrock

Elevation: 1000-1165 m

Abundance: rare

Phenology: fertile fronds: March-Dec.; sori: March-Dec.

sterile fronds: Jan.-Dec.

Specimen : Bañoc 76 (1120 m, 23 October 1996)

Bolbitis virens (Wall. ex Hk. & Grev.) Schott var. *virens*

Lomariopsidaceae

Evergreen herb. Rhizome creeping on rocks close to the ground, brown, c. 1-1.5 cm diameter. Scales linear, tip long acuminate; base rounded, basifixed, strigose, prominently calathrate, black, c. 5-8 x 0.5-0.8 mm. Fronds once pinnate, bimorphic. Sterile fronds oblanceolate, c. 40-68 x 15-20 cm; stipes scaly at the base, grooved dorsally, glabrous, green and drying stramineous, c. 44 cm long; costae glabrous, green and drying stramineous, c. 24 cm long; pinnae 10, alternate, coriaceous, glabrous, oblong to lanceolate, tip acuminate, base acute, margin slightly crenate; venation reticulate; dark green above, green below; c. 22-24 x 4-4.5 cm; stalks c. 5 mm long. Fertile fronds oblanceolate, c. 83 x 20 cm; stipes scaly at the base, otherwise glabrous, green and drying stramineous, c. 60 cm long; soriferous pinnae 13, alternate, glabrous ventrally, linear, tip rounded to acute, base acute, margins slightly dentate; light green; c. 14-15 cm x 4-5 mm; stalks c. 5-7 mm long. Sori acrostichoid, covering the ventral surface; light green; exindusiate. Sporangia glabrous.

Habitat: shaded areas in slightly disturbed primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 1120 m

Abundance: very rare

Phenology: fertile fronds: March.-Dec.; sori: March.-Dec.

sterile fronds: Jan.-Dec.

Specimen : Maxwell 93-1409 (1200 m, 20 November 1993)*

* : specimen in the CMU Herbarium from Doi Kuhn Dahn National Park, Lamphoon Province

Arachniodes henryi (Christ) Ching

Dryopteridaceae

Evergreen herb. Rhizome creeping in soil, brown outside, green inside, c. 1 cm diameter. Scales ovate-lanceolate, tip acuminate, basifixed, sparsely strigose, slightly calathrate, pale green to brown, 6-10 x 1.5-2 mm. Fronds 4-5x pinnate, oblong-ovate, c. 91 x 74 cm. Stipes densely scaly especially at the base, green and drying stramineous, 33-41 cm long. Costae sparsely scaly, green and drying stramineous, c. 50 cm long. Pinnae 20 + terminal segment, alternate, papyraceous, glabrous, c. 38 x 19 cm; stalks c. 2.5 cm long. Pinnules 7 + terminal segment, alternate, oblong, shallowly lobed, tips of lobes acute; venation pinnate; dark green and drying yellow-green above, pale green and drying yellow-green underneath; c. 8-9 x 3-4 cm. Sori round, solitary at the tip of free veins; c. 1 mm diameter. Indusia thin, round, brown; c. 1 mm diameter. Sporangia glabrous.

Habitat: partially shaded area in primary, evergreen, seasonal, hardwood forest, tea plantation; granite bedrock

Elevation: 1200-1250 m

Abundance: rare

Phenology: fronds: Jan-Dec; sori: April-June

Specimen : Bañoc 40 (1225 m, 8 May 1996)

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Dryopteris cochleata (D. Don) C. Chr.

Dryopteridaceae

Deciduous perennial herb. Rhizome creeping in soil; brown outside, green inside, c. 2.5 cm diameter. Scales thin, linear-lanceolate, tip acuminate, basifixed, sparsely strigose, calathrate, light brown, c. 4-5 x 0.5-1 mm. Fronds once pinnate, bimorphic. Sterile fronds ovate-lanceolate, c. 53 x 20 cm; stipes scaly at the base, otherwise glabrous, green and drying stramineous, c. 16 cm long; costae glabrous, green and drying stramineous, c. 38 cm long; pinnae 18 + terminal segment, alternate, thin, glabrous dorsally, sparsely scabrous ventrally, linear to lanceolate, tip acuminate, base truncate, margins serrulate; venation pinnate; green and drying light green above, light green and drying very light green below; c. 9-10 x 3-3.5 cm; stalk c. 2-7 mm long. Fertile fronds ovate-lanceolate, c. 83 x 14 cm; stipes scaly at the base, otherwise glabrous, green and drying stramineous, c. 48 cm long; costae glabrous, green and drying stramineous, c. 25 cm long; pinnae 24 + terminal segment, alternate, thin, glabrous, oblong to linear-lanceolate, tip acute, base truncate, margin lobed nearly to the costule, tips of lobes round, green and drying light green, c. 4-7 x 1 cm, stalk c. 4-10 cm long; sori in dense mass on ventral surface of lobes, almost achrostichoid; indusia thin, reniform, glabrous, brown, c. 1 mm diameter; sporangia glabrous.

Habitat: shaded area in disturbed, degraded, deciduous hardwood forest with much bamboo; granite bedrock.

Elevation: 700-800 m

Abundance: very common

Phenology: fronds: May-Dec.; sori: July-Dec.

Specimen: Bañoc 83 (700 m, 27 October 1996)

Dryopteris porosa Ching

Dryopteridaceae

Evergreen herb. Rhizome creeping in soil, brown outside, yellow-green inside, c. 3 cm diameter. Scales thin, linear-lanceolate, tip acuminate, basifixed, strigose, calathrate, light brown, c. 6 x 1 mm. Fronds 2x pinate, oblong to lanceolate, c. 90 x 23 cm. Stipes glabrous, yellow-green and drying stramineous, c. 53 cm long. Costae glabrous, yellow-green and drying stramineous, c. 35 cm long. Pinnae 14 + terminal segment, alternate, oblong to lanceolate, c. 9.5-11.5 x 3-4 cm; stalks c. 4-5 mm long. Pinnules 18-2- + terminal segment, alternate, sessile, thin, glabrous, oblong, tips round, base adnate to costules, margins entire to slightly lobed; venation pinnate, forked 1/2 way from the costule, veins all free; green and drying greenish-brown above, light green and drying brown below; c. 1.5-2 x 0.5-1 cm. Sori orbicular, 4-6 pairs between the costule and the margin of the pinnules, c. 1.5-2 mm diameter. Indusia thin, reniform, glabrous, pale yellow to dark grey, c. 1.5-2 mm diameter. Sporangia glabrous.

Habitat: open area in disturbed, primary evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 1100-1125 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: Jan. Dec.

Specimen: Bañoc 88 (1100 m, 24 October 1996)

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Pleocnemia irrigularis (Presl) Holtt.

Dryopteridaceae

Evergreen herb. Rhizome creeping in soil, green, c. 10 mm diameter. Scales thick, lanceolate; tip long acuminate, basifixed, sparsely strigose, blackish-brown, margins ferruginous, c. 4-9 x 0.5-1.5 mm. Fronds 2x pinnate, oblong, c. 85-89 x 41-60 cm. Stipes glabrous, grooved, green and drying stramineous, 55-58 cm long. Costae glabrous, grooved, green and drying dull castaneous, 30-31 cm long. Pinnae 4 pairs + terminal segment, opposite to sub-opposite, thin, glabrous, oblong, tip acuminate, c. 30 x 20 cm, stalks c. 2 cm long. Pinnules c. 10 + the terminal segment, alternate, sessile, oblong, tip acuminate, base slightly acute, margins lobed c. 3/5 towards the costule, tips of lobes rounded; venation reticulate; dark green and drying greenish-brown above, green and drying greenish-brown below. Sori orbicular, solitary along the tips of free veinlets on each lobe; c. 1 mm diameter. Indusia thin, round, glabrous, peltate, pale brown, c. 1.5 mm diameter. Sporangia glabrous.

Habitat: shaded area along a permanent stream in primary, evergreen, seasonal, hardwood forest, tea plantation; granite bedrock

Elevation: 1100-1130 m

Abundance: rare

Phenology: fronds: Jan.-Dec.; sori: May-Oct.

Specimen : Bañoc 73 (1120 m, 23 Oct. 1996)

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Thelypteris ciliata (Wall. ex Benth.) Ching

Thelypteridaceae

Evergreen herb. Rhizome erect, on rocks (epilithic), blackish-brown, 1-2 cm diameter. Roots wiry, blackish. Scales ovate; tip long-acuminate; basifixed; margins scabrous, prominently calathrate, light brown, 3-3.5 x 1.0-1.3 mm. Fronds once-pinnate, oblong to lanceolate, 21-41 x 7-9 cm. Stipes densely hispidulous, base scaly, green and drying brownish-green, 8-23 cm long. Costae densely hispidulous, green and drying brownish-green, 13-18 cm long. Pinnae 24-30 + terminal segment, alternate, sessile, oblong, thin, hispidulous; tip acute; base oblique; margins lobed c. $\frac{1}{3}$ - $\frac{1}{2}$ way to the costules; tips of lobes acute; lower pinnae slightly reduced and slightly reflexed; venation pinnate; light green and drying dark green above, very light green and drying green underneath; 3-4.5 x 0.6-1 cm. Sori orbicular, on veinlets, c. 1 mm from the costule, c. 1 mm diameter. Indusia reniform, basifixed, pilose, pale brown, covering the sori, persistent. Sporangia glabrous.

Habitat: shaded, moist, permanent stream; primary, evergreen, seasonal, hardwood forest; granite bedrock.

Elevation: 1100-1300 m

Abundance: rare

Phenology: fronds: Jan.-Dec.; sori: March-June

Specimen : Bañoc 38 (1120 m, 17 April 1996)

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Thelypteris falciloba (Hk.) Ching

Thelypteridaceae

Evergreen herb. Rhizome erect, on rocks (epilithic), brown outside, pale green inside, 4-10 mm diameter. Roots fibrous, black. Scales sparse, linear-lanceolate; tip acute; basifixed, sparsely strigose, prominently calathrate, light brown, 3.5-4.5 x 1-1.3 mm; prominent at the base of stipes. Fronds once pinnate; obovate, 26-51 x 6-9 cm. Stipes densely strigose, light green and drying stramineous, 9-23 cm long. Costae densely strigose, light green and drying stramineous, 17-28 cm long. Pinnae 28-36 + terminal segment, opposite to alternate, sessile, linear, thin, strigose; tip shortly acuminate; base obliquely acute, basiscopic side c. 45°, acroscopic side c. 10°; margins lobed c. $\frac{3}{4}$ to the costules; tips of lobes apiculate; aerophore present at the base of each costule; lower pinnae abruptly reduced to auricles; venation pinnate with 1 veinlet running to or adjacent to each sinus; green above, light green below; 4-10 x 0.4-1.0 cm. Sori orbicular, solitary along the middle of each vein, brown. Indusia orbicular, basifixed, glabrous, pale green to light brown, c. 0.5 mm diameter. Sporangia glabrous.

Habitat: open, moist rocks along a permanent stream (Mae Lai) in deciduous, degraded, hardwood (former teak) forest; granite bedrock

Elevation: 600-640 m

Abundance: rare

Phenology: fronds: Jan.-Dec.; sori: Sept.-Dec.

Specimen: Bañoc 84 (620 m, 30 Oct. 1996)

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Thelypteris hirtisora (C. Chr.) K. Iwats.

Thelypteridaceae

Evergreen herb. Rhizome long creeping in soil, dark brown, c. 0.4-0.6 mm diameter. Scales thin, linear-lanceolate; tip acuminate; basifixed, glabrous, prominently calathrate, brown, 5-6 mm x 0.8-1 mm. Fronds once pinnate, ovate, c. 39-69 x 30-45 cm. Stipes densely pilose, grooved, green and drying stramineous, 26-45 cm long; scaly at the base. Costae very densely hirsute, green and drying stramineous, 13-24 cm long. Pinnae 21-25, sub-opposite, sessile, linear-lanceolate, thin, densely pilose; tip long acuminate; base obliquely obtuse, acroscopic side c. 15°, basiscopic side c. 25°; margins lobed c. $\frac{1}{5}$ to the costule; tips of lobes apiculate; a few lower pinnae abruptly reduced; venation anastomosing with 3.5 pairs of veins united below each sinus; dark green above, green below; c. 19-23 cm x 2-2.5 cm. Sori orbicular, solitary, within each veinlet from the costule to c. $\frac{1}{2}$ - $\frac{2}{3}$ to the tips of lobes, c. 1 mm diameter. Indusia round, peltate, densely pilose, brown. Sporangia setose.

Habitat: shaded, slightly disturbed primary, evergreen, seasonal, hardwood forest;
granite bedrock

Elevation: 1100-1120 m

Abundance: rare

Phenology: fronds: Jan.-Dec.; sori: Sept.-Nov.

Specimen : Bañoc 78 (1120 m, 22 Oct. 1996)

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Thelypteris interrupta (Willd.) K. Iwats.

Thelypteridaceae

Evergreen herb. Rhizome creeping in soil, dark brown, 3-4 mm diameter. Scales ovate-lanceolate; tip acuminate; basifixed, glabrous, slightly calathrate, brown, 10-11 x 0.5-1 mm. Fronds once pinnate, ovate-lanceolate, 42-52 x 12-18 cm. Stipes sparsely strigose, brownish-green and drying stramineous, 22-30 cm long. Costae puberulous, brownish-green and drying stramineous, 20-22 cm long. Pinnae 34-38 + terminal segment, subopposite to alternate, sessile, thin, tomentose on both surfaces, linear-lanceolate; tip acuminate; base obliquely acute, acroscopic side c. 45°, basiscopic side c. 10°; margins lobed c. 2/3 to the costule; tips of lobes acute; venation with 1.5 pairs of veins united below each sinus; green above, light-green underneath; c. 5-7.5 x 0.7 cm. Sori orbicular, solitary along the upper 2/3 of each vein from the costa nearly to the tip of each lobe. Indusia orbicular-reniform, basifixed, scabrous, persistent, light brown, c. 0.1 mm diameter. Sporangia glabrous.

Habitat: slightly disturbed, partly open, seasonally moist area along a permanent stream
in primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 950-1125 m

Abundance: rare

Phenology: fronds: Jan.-Dec.; sori: Jan.-Oct.

Specimen: Bañoc 35 (1070 m, 9 April 1996)

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Thelypteris nudata (Roxb.) Morton

Thelypteridaceae

Evergreen herb. Rhizome creeping in soil, brown, 10-12 cm diameter. Roots fibrous, brown. Scales ovate-lanceolate; tip acuminate; base rounded, sparsely strigose, prominently calathrate, brown, 3-6 x 0.5-3 mm. Fronds once pinnate, oblong, 107-162 x 48-60 cm. Stipes grooved dorsally, glabrous, maroon-green and drying stramineous, 52-77 cm long. Costae grooved dorsally, sparsely scabrous, green and drying stramineous above, light green and drying stramineous below, 55-85 cm long. Pinnae 19-28 + terminal segment, alternate, sessile, linear, coriaceous, sparsely strigose on both surfaces; tip acuminate; base cuneate; margins crenate, sparsely scabrous; venation reticulate; green above, dull green below; 24-29 x 3.5-5.5 cm. Sori orbicular, between the costule and the margin; c. 0.5 mm diameter. Indusia peltate, sparsely setose to glabrous, pale brown, caducous. Sporangia glabrous.

Habitat: partly shaded, permanent stream in degraded, fire prone, deciduous hardwood forest with much bamboo; granite bedrock.

Elevation: 300 - 900 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: March-Dec.

Specimen: Bañoc 54 (650 m, 16 April 1996)

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Thelypteris parasitica (L.) Fosb.

Thelypteridaceae

Evergreen herb. Rhizome creeping in soil, brown, c. 0.4-0.5 mm diameter, bearing a tuft of fronds. Scales linear; tip long-acuminate; basifixed, sparsely strigose, thin, prominently calathrate, light brown, 3-3.5 mm x 0.2-0.5 mm. Fronds once pinnate, ovate, 19-29 x 15-21 cm. Stipes sparsely pilose, grooved, green and drying stramineous, 10-17 cm long. Costae densely pilose, grooved, green and drying stramineous, 9-12 cm long. Pinnae 32-38 + terminal segment, alternate, sessile, thin, sparsely pilose, linear-lanceolate; tip acuminate; base truncate; margin lobed c. $\frac{2}{3}$ to the costule; tips of lobes acute; basal pinnae slightly reflexed; venation goniopteroid with a pair of nerves uniting just below the sinus; yellow-green above, light yellow-green below; c. 9-11 x 1.2-1.5 cm. Sori orbicular, solitary, along the middle of each veinlet, i.e. 2 rows in each lobe. Indusia orbicular-reniform, basifixed, sparsely strigose, c. 0.2-0.5 mm diameter. Sporangia glabrous.

Habitat: open area in disturbed primary, evergreen, seasonal, hardwood forest, tea plantation; granite bedrock

Elevation: 1000-1020 m

Abundance: common

Phenology: fronds: Jan.- Dec.; sori: Jan.-Dec.

Specimen : Bañoc (1020 m, 22 October 1996)

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Thelypteris siamensis Tag. & K. Iwats.

Thelypteridaceae

Evergreen herb. Rhizome erect, in soil, brown, 10 x 1 cm. Roots fibrous, brown. Scales ovate-lanceolate; tip acuminate; base rounded, peltate, sparsely strigose, prominently calathrate, brown, 7-9 x 0.5-1.2 mm. Fronds once pinnate, ovate-lanceolate, 70-90 x 15-20 cm. Stipes densely hispid, brown, drying castaneous, 22-35 cm long. Costae hispidulous, green, drying castaneous, 48-55 cm long. Pinnae 20-25 + terminal segment, alternate, sessile, ovate-lanceolate, papyraceous, strigose; tip acuminate; base obliquely acute, acroscopic side c. 15°, basispic side c. 20°; margins lobed c. 1/3-1/2 to the costule; tips of lobes acute; lower pinnae slightly reduced, reflexed, auricled on the acroscopic base; venation with 2 pairs of veins united below each sinus; green above, light green underneath; c. 10-11 x 1.4-1.6 cm. Sori orbicular, solitary along the upper 2/3 of each vein from the costule to c. lower 1/3 of each lobe. Indusia orbicular-reniform, basifixed, hirsute, light brown, c. 2 mm diameter. Sporangia glabrous.

Habitat: slightly disturbed, partly open, moist area along a permanent stream in primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 950-1125 m

Abundance: rare

Phenology: fronds: Jan.-Dec.; sori: Jan.-Sept.

Specimen: Bañoc 33 (1070 m; 9 April 1996)

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Thelypteris subelata (Bak.) K. Iwats.

Thelypteridaceae

Evergreen herb. Rhizome creeping in soil, brown c. 3-4 mm diameter. Scales linear; tip acuminate; basifixed; sparsely strigose, slightly calathrate, dark brown, 5-5.5 x 0.3-0.5 mm. Fronds once pinnate, ovate-lanceolate, 21.5-53.5 x 10-11 cm. Stipes strigose, shallowly grooved, green and drying stramineous, 6.5-21.5 cm long. Costae strigose, green and drying stramineous, 15-32 cm long. Pinnae 17-21 + terminal segment, sub-opposite, sessile, thin, strigose, linear; tip acuminate; base obliquely cuneate, acroscopic side c. 40°, basiscopic side c. 25°; margin lobed c. 1/3 to the costule; tips of lobes rounded to apiculate; lowest 1-2 pairs of pinnae reduced; venation anastomosing with 2-3 pairs of veins uniting below the sinus; green above, light green below; 5-6 x 1-1.3 cm. Sori orbicular, solitary along each veinlet from the costule nearly reaching the tips of the lobes. Indusia orbicular, peltate, glabrous, pale brown, c. 0.5-1 mm diameter. Sporangia glabrous.

Habitat: partly shaded area near a dirt road in very disturbed, primary, evergreen, seasonal, hardwood forest, tea plantation; granite bedrock

Elevation: 1100-1120 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: Jan.-Dec.

Specimen : Bañoc 77 (1100 m 24 October 1996)

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Thelypteris truncata (Poir.) K. Iwats.

Thelypteridaceae

Evergreen herb. Rhizome erect, in soil, brown outside, green inside, 12-22 x 3-5 cm. Roots fibrous, brown. Scales ovate-lanceolate; tip acuminate; basifixed, sparsely strigose, calathrate, brown, 6-10 mm x 1-2 mm. Fronds once pinnate, oblong-lanceolate, 154-181 x 30-45 cm. Stipes sparsely puberulous, dorsally slightly greenish and drying light-green, ventrally green and drying light-green; 59-71 cm long. Costae green, 95-110 cm. Pinnae 54-60 + terminal segment, alternate, sessile, thin, glabrous, linear; tips acuminate; base obliquely acute, acroscopic side c. 45°, basispic side c. 60°; margins lobed c. 1/3 to the costule; tips of lobes bluntly undulate; aerophore prominent at the ventral base of each costule; lower pinnae abruptly reduced to auricles; venation with 1.5-2.5 pairs of veins united below each sinus; green above, light green underneath; 12-21 x 1-6-1.8 cm. Sori orbicular, solitary along the lower 1/3 of each vein from the costule nearly to the tip of each lobe. Indusia orbicular, peltate, glabrous, light-brown, c. 0.5 mm diameter. Sporangia glabrous.

Habitat: shaded alluvium in a permanent stream in primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 950-1125 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: Jan.-Dec.

Specimen: Bañoc 31 (1125 m, 26 March 1996)

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Anisocampium cumingianum Presl
Athyriaceae

Deciduous perennial herb. Rhizome creeping in soil, brown, 4-6 mm diameter. Scales ovate-lanceolate; tip acuminate; base rounded, peltate, glabrous, slightly calathrate, brown, 6-9 mm x 0.1-1 mm. Fronds once pinnate, ovate, 44-54.5 x 15-26 cm. Stipes grooved, glabrous, maroon and drying stramineous, 24-30 cm long. Costae grooved, glabrous, maroon and drying stramineous, 20-24.5 cm long. Pinnae 7-19, alternate, ovate-lanceolate, herbaceous, glabrous; tips acuminate; base nearly truncate; margins shallowly serrate; venation distinct, reticulate; green above light green underneath; 12.5-15.5 x 2.5 cm; stalks c. 1-2 mm long. Sori orbicular, scattered throughout the ventral side of the pinnae, brown. Indusia reniform, basifixed, sericeous, light green and drying pale brown, c. 0.5 mm diameter. Sporangia glabrous.

Habitat: partly shaded, disturbed, deciduous, degraded, hardwood (teak) + bamboo forest; granite bedrock

Elevation: 650- 800 m

Abundance: not common

Phenology: fronds: May - Dec.; sori: May - Dec.

Specimen: Bañoc 39 (700 m, 21 May 1996)

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Diplazium esculentum (Retz.) Sw.

Athyriaceae

Evergreen, rheophytic/amphibious herb. Rhizome erect, in moist alluvium, greenish-brown, c. 2.5 cm diameter. Roots wiry, blackish-brown. Scales ovate-lanceolate; tip acute; basifixed; margins scabrous, prominently calathrate, thick, margins black medially, dark brown; 7-7.5 x 0.5-1 mm. Fronds 2x pinnate, ovate-lanceolate, c. 63-131 x 25-35 cm. Stipes grooved, sericeous, brownish and yellow-green, drying stramineous; base castaneous, 11-40 cm long. Costae densely pilose, light green and drying stramineous; 52-91 cm. Pinnae 15-20 + terminal segment, alternate, ovate-lanceolate, sub-coriaceous, glabrous; tips acuminate; c. 15-20 x 8-12 cm. Pinnules 8-12 + terminal segment, alternate, sessile, oblong to lanceolate, glabrous; tips acuminate; base slightly cuneate; margins serrate; pinnately veins anastomosing distally; light green above, very light green underneath; c. 4.6 x 1-1.5 cm; stalks c. 5 mm long. Sori linear, on each veinlet. Indusia linear, brown. Sporangia glabrous.

Habitat: open, permanent stream in degraded, fire prone, deciduous, hardwood forest with much bamboo; granite bedrock.

Elevation: 200 - 700 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: March-June

Specimen : Bañoc 47 (650 m; 16 April 1996)

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Aglaomorpha coronans (Wall. ex Mett.) Copel.

Polypodiaceae

Massive, evergreen, epilithic or epiphytic herb, c. 50-100 cm basal diameter. Rhizome creeping, thick, green to brown, c. 2-2.5 cm diameter. Scales dense, linear; tip long-acuminate; basifixed, prominently strigose and calathrate, golden-brown, 13-17 x 0.4-0.6 mm. Fronds simple, "nest-like", broadly oblong, 28-180 x 38 cm. Laminae coriaceous, sparsely pilose on ventral sides of the costae; tip acute; base rounded to cordate, basal part shallowly lobed, becoming dry and persistent, c. 14-17 x 9-12 cm; margins of upper part of the laminae deeply lobed, nearly to the costa; lobes c. 26-29, linear-lanceolate; tips of lobes acute, c. 20-21 x 3-4 cm; venation reticulate, prominent on both surfaces; yellow-green above and drying stramineous; pale yellow-green below and drying stramineous. Sori oblong, scattered along finer veins. Sporangia glabrous.

Habitat: open place on granite bedrock along a permanent stream in primary evergreen, seasonal hardwood forest; granite bedrock; also observed in shaded, primary, evergreen, seasonal, hardwood forest as an epiphyte

Elevation: 1000-1165 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: April-Dec.

Specimen : Bañoc 49 (1000 m, 16 April 1996)

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Colysis pothifolia (D. Don) Presl

Polypodiaceae

Evergreen herb. Rhizome creeping in soil, brown, c. 5 mm diameter. Scales linear; tip acuminate; basifixed, sparsely strigose, prominently calathrate, black, c. 4-5 x 0.5-0.8 mm. Fronds deeply pinnately lobed nearly to the costa, thin, glabrous, ovate to ovate-oblong, c. 72 x 28 cm. Lobes 13; tip acuminate; margins slightly dentate; venation reticulate; dark green above, green below; c. 16-18 x 2.5-3.5 cm. Stipes glabrous, green and drying brown, c. 36 cm long. Sori linear, along the finer veins, c. 5-10 mm long; exindusiate. Sporangia glabrous.

Habitat: shaded area along a permanent stream in a primary evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 1100 m

Abundance: rare

Phenology: fronds: Jan.-Dec.; sori: Feb.-Oct.

Specimen: Maxwell 93-503 (1200 m, 25 May 1993)*

* : specimen in the CMU Herbarium from Doi Lang Gah, Chiang Mai Province

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Drynaria bonii Christ

Polypodiaceae

Deciduous, epiphytic or epilithic, perennial herb. Rhizome creeping, brown outside and green inside, c. 1.5 cm diameter. Scales thin, ovate-lanceolate; tip long acuminate; base rounded, peltate, sparsely strigose, calathrate, brown, c. 3.8-4.5 x 1-1.5 mm. Fronds simple, bimorphic. Sterile fronds marginal, "nest-like", coriaceous, glabrous, ovate; tip acute, base cordate, sessile; margins dentate; venation drynaroid; brown; c. 9-12 x 9-15 cm. Fertile fronds surrounded by the sterile fronds. Fertile laminae coriaceous, glabrous, obovate; deeply pinnately lobed; tips of lobes acuminate, c. 13-14 x 3-3.5 cm; venation drynaroid; dull green and drying stramineous; c. 25 x 21 cm; stipes c. 10-15 cm. Sori round, scattered; exindusiate. Sporangia glabrous.

Habitat: partly shaded area in primary evergreen, seasonal, hardwood forest; also seen in degraded, deciduous, dipterocarp-oak forest; granite bedrock

Elevation: 600-1050 m

Abundance: common

Phenology: fertile fronds: May-Dec.; sori: May-Dec.

sterile fronds: Jan.-Dec.

Specimen: Bañoc 18 (870 m, 22 October 1995)*

* : specimen in the CMU Herbarium from Jae Sawn National Park, Lampang Province

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Drynaria rigidula (Sw.) Bedd.

Polypodiaceae

Deciduous, epiphytic to epilithic, perennial herb. Rhizome creeping, brown, c. 5 mm diameter. Scales ovate-lanceolate; tip long acuminate; base rounded, peltate, densely strigose, brown, c. 2-3 x 0.3-0.5 mm. Fronds bimorphic. Sterile fronds marginal, simple, "nest-like", coriaceous, glabrous dorsally, strigose ventrally, obovate; tip acuminate; base broadly truncate, sessile; margins lobed c. 1/2 to the costa, tips of lobes rounded to acute; light brown; c. 17 x 9 cm. Fertile fronds once pinnate, ovate-lanceolate, c. 125 x 30 cm; stipes pilose, blackish, c. 30 cm long; costae pilose, blackish, 85 cm long; pinnae 70-80, alternate, thin, glabrous, ovate-lanceolate, base acute, tip rounded to acute, margins serrate; venation drynarioid; green and drying greenish-brown above, light green and drying light greenish-brown underneath; c. 14-15 x 1-1.7 cm; stalks c. 2 cm long. Sori round, solitary, in one row on each side of the costule; exindusiate. Sporangia glabrous.

Habitat: open area in very degraded, fire prone, deciduous, dipterocarp-oak forest;
granite bedrock

Elevation: 600-750 m

Abundance: rare

Phenology: fertile fronds: June-Dec.; sori: June -Nov.

sterile fronds: Jan.-Dec.

Specimen: Maxwell 93-1420 (1275 m, 21 November 1993)*

* : specimen in the CMU Herbarium from Doi Doi Kuhn Dahn,
National Park, Lamphoon Province

Lepisorus scolopendrium (Ham. ex D. Don) Tag.

Polypodiaceae

Evergreen epiphytic or epilithic herb. Rhizome creeping, brown, c. 4 mm diameter. Scales linear-lanceolate; tip acuminate; base rounded, peltate, sparsely strigose, prominently calathrate, ferruginous at the margins, brown, 3-4 x 1-1.2 mm. Fronds simple. Laminae thin, glabrous, oblong to lanceolate; tip acuminate, base attenuate, margins slightly undulate; venation reticulate, indistinct; green and drying blackish-brown above, light green and drying brown underneath; c. 19-24 x 1.5-2 cm; stipes 0.5-2 cm long. Sori oblong, solitary in one row on each side of the costule at the upper part of the laminae; c. 3-5 mm diameter. Indusia thick, glabrous, oblong, brown, covering the sori. Sporangia glabrous.

Habitat: partly open area in relatively undisturbed, primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 1165 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: Aug-Jan.

Specimen: Maxwell 93-773 (1,350; 17 July 1993)*

* : specimen in the CMU Herbarium from Doi Doi Kuhn Dahn, National Park, Lamphun Province; mostly shaded, fire-prone area, mixed pine + evergreen hardwood forest; granite bedrock

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Leptochilus decurrens Bl.

Polypodiaceae

Evergreen, amphibious herb. Rhizome creeping on rocks (epilithic), dark brown, 3-4 mm diameter. Scales ovate-lanceolate; tip acuminate; base rounded, peltate, glabrous, prominently calathrate, brown, 2-2.5 x 0.75-1 mm. Fronds simple, dimorphic, glabrous. Sterile laminae chartaceous, ovate-lanceolate; tip acute, decurrent at the base, entire; venation reticulate; costules 22-26 subopposite to alternate pairs; green and drying dark-brown above, lighter green and drying light brown underneath, 12-17 cm x 2.2-4.5 cm; stipes brownish-green, c. 1.5-5.5 cm long. Fertile laminae few, linear; soriferous part acrostichoid, c. 13-20 cm x 3 mm in the upper part of the lamina; stipe 19-23 cm long. Sori acrostichoid, brown; exindusiate. Sporangia glabrous.

Habitat: shaded, moist, permanent streams in primary, evergreen, seasonal, hardwood forest; granite bedrock

Elevation: 950-1250 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: Jan.-Sept.

Specimen: Bañoc 51 (1125 m, 26 March 1996)

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Microsorium membranaceum (D. Don) Ching

Polypodiaceae

Deciduous epiphytic or epilithic herb. Rhizome creeping, brown, c. 0.8-1.2 cm diameter. Scales thick, linear-lanceolate; tip acute; base rounded, peltate, sparsely strigose, prominently calathrate, black, c. 2-4 x 0.8-1.8 mm. Fronds simple. Stipes winged, grooved, glabrous, green and drying stramineous, 5-10 cm long. Laminae thin, glabrous, linear-lanceolate; tip long acuminate; base attenuate; margin slightly dentate; venation drynarioid with many free veins. Sori numerous, scattered, orbicular; exindusiate. Sporangia glabrous.

Habitat: shaded, moist rocks in primary, evergreen, seasonal hardwood forest; waterfall area; granite bedrock

Elevation: 1120 -1130 m

Abundance: common

Phenology: fronds: June- Feb.; sori: Sept.-Dec.

Specimen : Bañoc 85 (1130 m, 23 Oct. 1996)

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Platyserium wallichii Hk.

Polypodiaceae

Deciduous, epiphytic to epilithic, perennial herb. Rhizome erect, brown, c. 1 cm diameter, with water absorbing fibrous tissue. Scales slightly thickened, linear; tip acuminate; basifixed, glabrous, brown, 6.5-7 x 1 mm. Fronds deeply, dichotomously lobed, bimorphic. Sterile laminae erect, marginal, "nest-like", sessile, broadly deltoid, chartaceous, upper margins lobed; tips of lobes rounded; venation reticulate; green and rapidly drying light green above, light green and drying light brown underneath; c. 41 x 26 cm; persistent. Fertile laminae 2, pendulous, coriaceous, broadly deltoid, densely stellate; deeply dichotomously lobed, the first pair of lobes c. 10 cm wide; venation reticulate; dark green above, light green below; c. 48 x 30 cm; deciduous. Sori in an acrostichoid patch, c. 3-5 mm from the margin of the 2 soriferous lobes; covered with dense stellate indumentum. Sporangia glabrous.

Habitat: partly shaded area in degraded, fire prone, deciduous, dipterocarp-oak forest;
granite bedrock

Elevation: 600-800 m

Abundance: common

Phenology: fertile fronds: May-Dec.; sori: Sept.-Dec.

sterile fronds: Jan.-Dec.

Specimen: Maxwell 96-1494 (675 m, 4 November 1996)*

* : specimen in the CMU Herbarium from Jae Sawn, National Park, Lamphang
Province

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Pyrrhosia adnascens (Sw.) Ching

Polypodiaceae

Evergreen epilithic or epiphytic herb. Rhizome long-creeping, brown, bearing fronds c. 2-3 cm apart, c. 1-1.5 mm diameter. Scales dense, imbricate, linear-lanceolate; tip acuminate; base rounded, peltate, prominently strigose, brown, margins very thin, light brown c. 2-4 x 0.8-1 mm. Fronds simple, bimorphic, shriveling during the dry season (Nov.-May). Stipes densely stellate, scaly at the base, grooved, castaneous, c. 1 cm long in sterile fronds and 3 mm in fertile fronds. Fertile laminae coriaceous, linear-lanceolate; tip acute; base obtuse; margins entire, with sparse stellate indumentum dorsally, densely so ventrally; venation obscure; dull dark green above, light green below and drying brown; c. 14-20 cm long. Sori acrostichoid in the upper part of the frond; exindusiate, covered with stellate hairs when young. Sporangia glabrous.

Habitat: partly shaded places on large granite boulders or tree trunks along permanent streams in degraded, fire prone, deciduous hardwood forest with much bamboo

Elevation: 600-700 m

Abundance: common

Phenology: fronds: Jan.-Dec.; sori: Jan.-Dec.

Specimen : Bañoc 61 (650 m, 29 August 1996)

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