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## THE FERNS OF BURMA<sup>1</sup>

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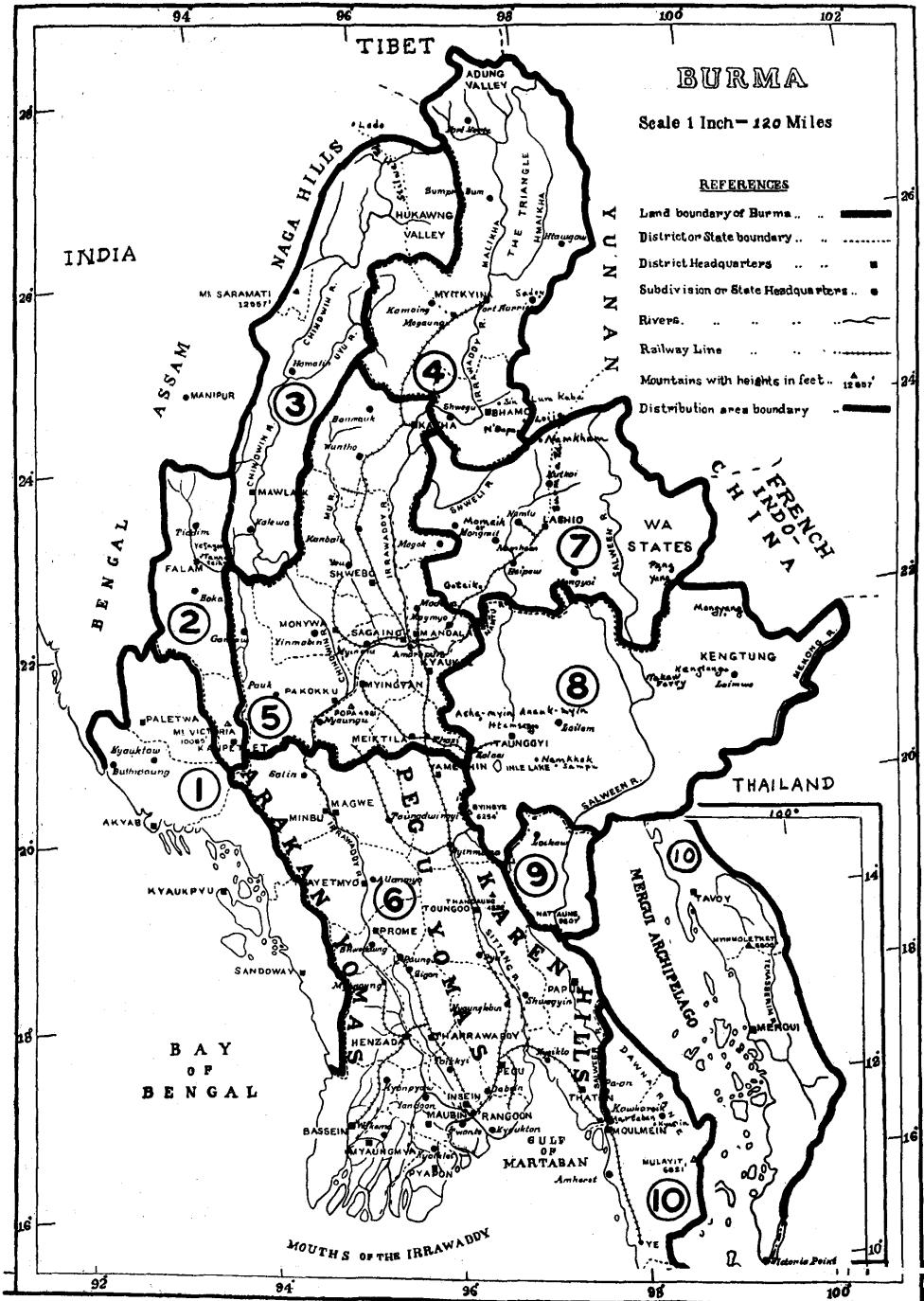
Burma, with rainfalls in its various districts of 20 to 225 inches from June to October and with habitats from sea level up to 18,000 feet, has a very rich fern flora. During the hundred years previous to 1920 fern study was confined almost entirely to the Pegu and Tenasserim Districts of lower Burma, but with the Joseph H. Rock collection of 1920-1924 from upper Burma, western China, and northern Siam, came the first accurate concept of the richness and variety of the ferns of upper Burma.

In 1931 the C. Snydam Cutting Sikkim Expedition of the Field Museum brought back about 25 fern specimens from the Burma-Tibet frontier. In 1937 the Vernay-Cutting Expedition of the New York Botanic Garden and the Natural History Museum collected in upper Burma and added two ferns to the Burma list. In 1943 Harold Young collected over a hundred ferns along the Stilwell Road near the Assam-Burma border, of which twenty were new records for Burma. The writer named the ferns collected by the Cutting Sikkim Expedition and by Harold Young. From 1930 to 1942 the writer has collected over 325 kinds of ferns in various parts of Burma. The total number of ferns reported to date for the country is 460, which belong to 104 genera. The writer's main collection is in the Herbarium of Judson College, Rangoon, Burma; duplicates of some numbers have been distributed to Gordon College, Rawalpindi, India, to Ohio State University, and to the Arnold Arboretum under whose auspices a part of the collecting was done. Numbers cited in the following enumeration refer to the writer's specimens, unless another collector's name is given.

Burma is so located that many ferns of both the China-Himalayan and the Malayan regions occur in the country. Of the 460 ferns reported for Burma, 125 are to be found also in that part of the Malay Peninsula which is under British protection, south of latitude 6.5° N. This is particularly remarkable because Burma lies north of the area having both summer and winter rains; in Burma the dry season lasts from the middle of October to the end of May. This long dry period must effectively limit the northward migration and establishment of many Malayan species whose ecological amplitude is not sufficient to permit them to survive the long dry season. An unpublished list of the ferns of the Malay Peninsula compiled in 1937 by R. E. Holttum of the Singapore Botanic Garden reports 419 ferns as occurring south of latitude 6.5° N.

Of the 125 ferns common to both Malaya and Burma some are cosmopolitan species such as *Adiantum capillus-veneris*, *Osmunda regalis*, *Pteridium aquilinum*, and *Pteris vittata*. Others are pantropic such as *Asplenium cuneatum*, *Didymochlaena truncatula*, *Dryopteris paleacea*, *Elaphoglossum petiolatum*, *Histiopteris incisa*,

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Map of Burma showing areas referred to in the text: 1, Arakan; 2, Chin Hills; 3, Upper Chindwin; 4, North-east Burma; 5, Central Burma; 6, Southern Burma; 7, Northern Shan States; 8, Southern Shan States; 9, Karenni, 10, Tenasserim,

*Mecodium polyanthos*, *Mephrolepis biserrata*, *N. cordifolia*, *N. exaltata* (*falcata*), *Pityrogramma calomelanos*, *Pteris biaurita*, and *Pteris quadriaurita*. There are rather more species common to Burma and Malaya which may also be found in Madagascar and (or) South Africa (Christensen 1932): this group includes *Adiantum caudatum*, *A. philippense*, *Asplenium adiantoides*, *A. macrophyllum*, *A. normale*, *A. unilaterale*, *Ceratopteris thalictroides*, *Crepidomanes bipunctatum*, *Davallia denticulata*, *Dicranopteris linearis*, *Lindcaya cultrata*, *Microsorium punctatum*, *Ophioglossum pedunculatum*, *O. pendulum*, *Schizoloma ensifolia*, *Stenoloma chusanum*, *Thamnopteris nidus*, and *Vittaria scolopendrina*.

The following genera which have representatives in the Burma flora are absent from Holttum's list of peninsular species: *Arthromeris*, *Azolla*, *Botrychium*, *Colysis*, *Cryptogramma*, *Ctenitis*, *Cyclopetlis*, *Cyrtomium*, *Davallodes*, *Diplaziopsis*, *Goniopteris*, *Lemmaphyllum*, *Marsilea*, *Microchlaena*, *Monachosorum*, *Neocheiropteris*, *Onychium*, *Salvinia*, *Selliguea*, and *Woodwardia*. In addition to these genera the Burma flora is much richer than the Malayan in *Cheilanthes*, *Dryopteris* sensu propria, *Lepisorus*, *Phymatodes*, *Polypodium* sensu propria, and *Polystichum*. The above 26 genera together with many others are widely distributed from northern India across Burma to southwestern and central China. The frequency of this distribution is emphasized by Ching's revisions of the genera "Dryopteris" and "Polypodium" of the China and Sikkim-Himalayan areas (1933b, 1933c, 1933d, 1934b, 1935c, 1936b, 1936c, 1938a, 1938b, 1938c, 1941c). These studies indicate essential similarity of the fern flora throughout the eastern Himalayas, Burma, and southwestern and central China. Since Burma is situated at the northwestern end of the Malaya Peninsula, and at the junction of the east-west ranges of the Indian Himalayas and the north-south ranges of Tibet and western China, the Burma fern flora is composed of species of these vast areas. Present records indicate that the northern species predominate over the southern species about 3 to 1.

#### KEY TO THE GENERA OF THE FERNS OF BURMA

1. Aquatic ferns . . . . . 2
1. Not water ferns . . . . . 5
  2. Leaflets 4, clover-like . . . . . 102. **Marsilea**
  2. Leaf blade not like a 4-leaf clover . . . . . 3
3. Leaves relatively large (6-18 in.), pinnatifid or compound; vegetative budding from the leaflet axils or sinuses; rooted or free floating . . . . . 101. **Ceratopteris**
3. Leaves either minute or up to an inch long, entire, leaf margins not budding; free floating . . 4
  4. Leaves in whorls of 3, the upper 2 very hairy and floating, the third submerged and root-like . . . . . 103. **Salvinia**
  4. With very minute leaves closely placed on a branched stem, only slightly hairy; no dissected root-like leaf . . . . . 104. **Azolla**
5. Leaves simple, margin entire or nearly so . . . . . 6
5. Leaves simple but dichotomously forked or palmately lobed . . . . . 29
5. Leaves pinnatifid or compound . . . . . 31
  6. Sporangia on narrow spike-like sporangiophores arising from the base or apex of the sterile part of blade . . . . . 7
  6. Sporangia not as above . . . . . 9
7. Sporangiphore arising from the base of the sterile part of blade; no annulus on the sporangia . . . . . 1. **Ophioglossum**
7. Sporangiphores arising from the apex of the sterile part of blade . . . . . 8
  8. Sterile part of blade grass-like; sporangia in digitate or pinnate tassels; annulus around the pointed apex of the large sporangia . . . . . 6. **Schizaea**
  8. Sterile part of blade not grass-like; sporangia small, on the very much narrowed, prolonged apex of the leaf; sporangia polypodioid . . . . . 49. **Hymenolepis**

9. Sporangia not in sori but covering back of blade, or so close together that they do not appear to be in sori . . . . . 10
9. Sporangia in marginal or linear sori, or following reticulate veins . . . . . 12
9. Sori round or roundish, sometimes very close together and almost hidden by stellate hairs, 22  
 10. Veins free, simple or forked . . . . . 64. **Elaphoglossum**  
 10. Veins anastomosing or reticulate . . . . . 11
11. Fertile leaf narrowly linear and entirely fertile; no stellate hairs . . . . . 55. **Leptochilus**
11. Sporophylls usually not contracted; stellate hairs abundant, almost hiding sori, 59. **Pyrrhosia**  
 12. Sori linear, parallel to margin (intramarginal) or marginal . . . . . 13  
 12. Sporangia forming a network along reticulate veins . . . . . 16  
 12. Sori oblique to the midrib . . . . . 17
13. Leaves dimorphic . . . . . 14
13. Leaves uniform . . . . . 15  
 14. Epiphytic, sporophylls linear . . . . . 60. **Drymoglossum**  
 14. Terrestrial, sporophylls deeply lobed and long petioled . . . . . 90. **Doryopteris**
15. Linear sorus sunk in a groove at or near margin; blade grass-like . . . . . 63. **Vittaria**
15. Linear sorus 1-2 mm. inward from each margin, not sunk in grooves. 48. **Lepisorus** (part)  
 16. Petiole of fertile leaf much elongated, polished . . . . . 99. **Hemionitis**  
 16. Petiole of fertile leaf like that of sterile, not elongated . . . . . 62. **Antrophyum**
17. Indusium present . . . . . 18
17. Indusium lacking . . . . . 20  
 18. Veins free . . . . . 19  
 18. Veins united by a marginal vein . . . . . 37. **Thamnopteris**
19. Sori in opposite pairs on adjacent veins, their indusia opening toward each other, often finally confluent . . . . . 36. **Phyllitis**
19. Sori not normally twinned in opposite pairs, single . . . . . 38. **Asplenium**  
 20. Without (or with very few) included veinlets . . . . . 61. **Loxogramme**  
 20. Free included veinlets present in the areoles . . . . . 21
21. Leaves herbaceous; lateral main veins flexuous and poorly developed; rhizome subhypogaeous . . . . . 54. **Colysis**
21. Leaves thick, rigid, glossy; lateral veins strong, raised, straight, reaching the margin; rhizome epigaeous, creeping . . . . . 52. **Selliguea**  
 22. Sori not on the end of veins or at the margin; blade more than 1 cell thick . . . . . 23  
 22. Sori on the end of veins or at the margin in cup or tubelike cavities; blade 1 to few cells thick . . . . . 70. **Microgonium**
23. Sori in 1 row (rarely 2) between the midrib and margin . . . . . 24
23. Sori in several rows between the main lateral veins or irregular; sometimes uniseriate in *Neochheiropteris ensata* . . . . . 27  
 24. Indusium present; venation free, forked . . . . . 40. **Oleandra**  
 24. Indusium lacking; venation not free . . . . . 25
25. Rhizome thick, fleshy, creeping; blades coriaceous, usually pinnatifid; venation drynarioid or goniophleboid, main laterals distinct . . . . . 51. **Phymatodes**
25. Rhizome creeping but not very fleshy; blades usually simple . . . . . 26  
 26. Rhizome slender, wide-creeping, subnaked; leaves distant, glabrous, fleshy, usually dimorphic . . . . . 50. **Lemmaphyllum**  
 26. Rhizome usually short creeping, very scaly; leaves fairly close, coriaceous or papery, generally uniform . . . . . 48. **Lepisorus**
27. Leaves bearing stellate hairs; sori close together, sometimes almost hidden by the stellate hairs . . . . . 59. **Pyrrhosia**
27. Leaves without stellate hairs; sori distant . . . . . 28  
 28. Rhizome hypogaeous, thick, fleshy, densely scaly with a tuft of unicellular brown hairs at point of attachment; sori covered when young with large, fuscous, clathrate, peltate scales . . . . . 47. **Neochheiropteris**  
 28. Rhizome wide-creeping or scandent; no tuft of unicellular brown hairs at point of attachment of rhizome scales; clathrate, peltate scales in sori usually lacking, 53. **Microsorium**

29. Leaf blade  $\frac{1}{2}$  in. each way, thinly membranous. . . . . **Gonocormus**  
 29. Leaf blade much larger, much thicker texture. . . . . 30  
     30. Epiphyte; leaf large, often dichotomously branched; sporangia crowded on soriferous disc. . . . . **44. Platycerium**  
     30. Terrestrial fern, palmately lobed; sori in a continuous marginal line. . . . . **90. Doryopteris**

## LEAVES PINNATIFID OR COMPOUND

31. Sori surficial. . . . . 32  
 31. Sori marginal, or in spike-like, panicle-like, or strobilus-like arrangement. . . . . 33  
     32. Sporangia spread over part of all the surface, not in sori (acrostichoid). . . . . 34  
     32. Sporangia in definite elongate sori. . . . . 40  
     32. Sporangia in round or roundish sori. . . . . 53  
 33. Sporangia in marginal sori. . . . . 82  
 33. Sporangia in spike-like, panicle-like, or strobilus-like arrangement. . . . . 101  
     34. Sporangia on apical pinnae, other pinnae sterile. . . . . 100. **Acrostichum**  
     34. Sporangia on partially or wholly fertile leaves; other leaves sterile. . . . . 35  
 35. Scandent fern, margin of leaflets cartilagenous, pinnae articulate with the rachis; veins parallel. . . . . **24. Stenochlaena**  
 35. Scandent, margins not cartilagenous; veins reticulate. . . . . **25. Lomagramma**  
 35. Not scandent, terrestrial, exindusiate. . . . . 36  
     36. Leaves bipinnate with white powdery coating on the under surface, . . . . . **98. Pityrogramma**  
     36. Leaves pinnate or pinnatifid, without powdery coating. . . . . 37  
 37. Rhizome erect or suberect, sometimes several feet tall. . . . . 38  
 37. Rhizome creeping, usually short. . . . . 39  
     38. Base of petioles covered with scales 1 in. long; base of pinnae cordate; caudex several inches thick. . . . . **43. Brainea**  
     38. Base of petioles enlarged and flat on adaxial face; base of pinnae not cordate, no long scales. . . . . **85. Plagioyria**  
 39. Veins free. . . . . **21. Egenolfia**  
 39. Veins anastomosing. . . . . **23. Bolbitis**

## SPORANGIA IN DEFINITE ELONGATE SORI ON ABAXIAL SURFACE

40. Sori apparently parallel to the midribs and margins. . . . . 41  
 40. Sori oblique to the midribs. . . . . 47  
 41. Venation free. . . . . 42  
 41. Venation reticulate. . . . . 45  
     42. Leaf palmately compound (dichotomously divided). . . . . **Actiniopteris**  
     42. Leaf pinnatifid or pinnate. . . . . 43  
 43. 3- or 4-pinnatifid, fertile segments narrow, podlike, sori covering most of segment at maturity. . . . . 44  
 43. Pinnate or pinnatifid; sorus contiguous to midrib, not near the margin. . . . . **41. Blechnum**  
     44. Vascular commissure connecting vein ends; leaves more than 5 in. long. . . . . **91. Omychium**  
     44. Without commissure; leaves usually less than 5 in. long. . . . . **88. Cryptogramma**  
 45. Fertile segments narrow; reflexed leaf margins meeting at the midrib; aquatic fern, . . . . . **101. Ceratopteris**  
 45. Fertile pinnae not narrowed; sori not covering the whole blade; not aquatic ferns. . . . . 46  
     46. Sori short, linear, contiguous with midribs; indusium present. . . . . **42. Woodwardia**  
     46. Sori the length of the pinnae, half way between midrib and margin. . . . . **96. Taenitis**  
 47. Without indusium. . . . . 48  
 47. Usually with indusium. . . . . 50  
     48. Veins anastomosing with free included veinlets. . . . . **54. Colysis**  
     48. Veins parallel and very close, branching once or twice. . . . . 49  
 49. Sori following the veins from midrib nearly to margin; distinct hydathodes near margin, . . . . . **97. Congiogramme**

49. Sori following veins with sporangia in 2 rows, near the margin but not extending to midrib; sori make line parallel with margin; huge fern; stipules fleshy . . . . . 4. **Angiopteris**  
 50. Sori all simple, never curved across a vein; lumen in cells of scales hyaline (clear),  
 38. **Asplenium**  
 50. Sori sometimes bent across a vein; delicate ferns; lumen in cells of scales pigmented,  
 32. **Athyrium**  
 50. Sori sometimes double; coarse ferns; lumen in cells of scales pigmented . . . . . 51  
 51. Veins anastomosing . . . . . 35. **Diplazopsis**  
 51. Veins free . . . . . 34. **Diplazium**

## SPORANGIA IN ROUND OR ROUNDISH SORI ON ABAXIAL SURFACE

53. Tree ferns . . . . . 54  
 53. Not tree ferns . . . . . 55  
 54. With costal areoles and free excurrent veins . . . . . 43. **Brainea**  
 54. Without costal areoles . . . . . 10. **Cyathea**  
 55. Rachis of leaves dichotomously branched, often a dormant bud in axil or branching; annulus transverse; sporangia sessile . . . . . 56  
 55. Not dichotomously branched; annulus neither transverse nor oblique; sporangia not sessile . . . . . 57  
 56. Leaves 1-pinnate (pectinate) above highest fork. Rhizome slender, hairy; blade of indefinite growth with pair of stipule-like pinnae at the forkings; veins 3-6 forked in each group; 6-12 sporangia per sorus . . . . . 8. **Dicranopteris**  
 56. Leaves bipinnate above last fork. Rhizome often  $\frac{1}{2}$  in. thick, densely scaly, blade of definite growth, no stipule-like pinnae at the sides of the forking; veins once forked; 2-6 sporangia per sorus . . . . . 9. **Hicriopteris**  
 57. Indusium lacking or quickly fugaceous . . . . . 58  
 57. Indusium present, persistent . . . . . 68  
 58. Leaves pinnatifid or pinnate . . . . . 59  
 58. Leaves slightly bipinnatifid to decompose . . . . . 64  
 59. Veins free and forked, or anastomosing to form 1 row (rarely 2) of subhexagonal costal areolae each with a simple excurrent soriferous veinlet . . . . . 46. **Polypodium**  
 59. Veins copiously reticulate forming many rows of small areoles with included veinlets . . . . . 60  
 59. Veins anastomosing by opposite pairs . . . . . 67  
 60. Some vegetative leaves wholly modified and humus collecting . . . . . 58. **Drynaria**  
 60. No vegetative leaves entirely modified nor humus collecting . . . . . 61  
 61. Very large leaves ( $\approx$  3 ft. long) with base of the petioles expanded and humus collecting (no distinct petiole) . . . . . 57. **Pseudodrynaria**  
 61. Leaves with distinct petioles, or sessile, but base not modified and humus collecting . . . . . 62  
 62. Blade generally pinnate (juvenile forms simple) with articulated pinnae,  
 56. **Arthromeris**  
 62. Blade simple, pinnatifid (rarely pinnate but if so, pinnae not articulate to rachis) . . 63  
 63. Leaf generally coriaceous, simple or pinnatifid with principal nerves reticulate, distinct; often dimorphous, sori in 1-2 rows between main veins; plant glabrous . . 51. **Phymatodes**  
 63. Leaf generally thin, entire (rarely pinnatifid), uniform, without distinct principal nerves; sori small, scattered irregularly, round, rarely in 7-8 regular rows . . 53. **Microsorium**  
 64. One vein in each ultimate leaf segment . . . . . 86. **Monachosorum**  
 64. More than 1 vein in each ultimate leaf segment . . . . . 65  
 65. Veins usually reticulate or anastomosing . . . . . 67  
 65. Veins free or with costal arch . . . . . 66  
 66. Habit of finely divided *Pteridium aquilinum*; leaf hairy on both surfaces; no tooth in sinuses . . . . . 49. **Hypolepis**  
 66. Habit of *Pteris quadriaurita*; a tooth in each sinus . . . . . 19. **Pteridrys**  
 67. Free included veinlets present . . . . . 22. **Tectaria**

67. Without free included veinlets.....105  
 68. Indusium inferior, globose, entire.....11. **Diacalpe**  
 68. Indusium peltate, reniform, or half cup-shaped.....69  
 69. Veins anastomosing or reticulate.....70  
 69. Veins free.....72  
 70. Without free included veinlets.....105  
 70. With free included veinlets.....71  
 71. Small irregular areoles, included veinlets pointing in all directions.....22. **Tectaria**  
 71. Larger subhexagonal areoles formed by repeated dichotomous branching of the veins; free included veinlets pointed in one direction only; sori in 1 or 2 lines, parallel with the midrib.....17. **Cyrtomium**  
 72. Terrestrial (or if epiphytic, then pinnae articulate to rachis).....73  
 72. Epiphytic.....79  
 73. Pinnae or pinnules articulate to the rachis.....74  
 73. Pinnae not articulate to the rachis.....75  
 74. Indusium oblong, attached longitudinally; leaf bipinnate.....84. **Didymochlaena**  
 74. Indusium reniform; leaf pinnate.....83. **Nephrolepis**  
 75. Indusium suborbicular or scale-like, inserted under the base of sorus; long, weak, jointed hairs on costa, rachis and pinnules; veins reaching the margin.....33. **Cystopteris**  
 75. Indusium reniform.....76  
 75. Indusium peltate.....77  
 75. Indusium fixed by base and sides.....78  
 76. Davallioid ferns, leaf pinnately decompound, pinnules in general rhomboidal in outline; rhizome creeping.....80. **Leucostegia**  
 76. Dryopteroid ferns, leaves not with decompound ultimate rhomboidal segments.....112  
 77. Sori in 1-3 rows on each side of midrib and parallel to it; petiole fibrillose at the base; pinnae nearly entire, cordate or truncate at the base.....15. **Cyclopeltis**  
 77. Sori in 1 row; pinnae enlarged on acroscopic side of the base, toothed; petiole scaly, 14. **Polystichum**  
 78. Stem erect; rachis nodose above at the insertion of pinnae; wide scales beneath at the base of each pinna; like *Cystopteris* but here veins do not reach the margin, 79. **Acrophorus**  
 78. Stem creeping.....**Microlepis**  
 79. Leaves once pinnate, leaflets articulate to rachis.....83. **Nephrolepis**  
 79. Leaves several times pinnate, leaflets not articulate to rachis.....80  
 80. Leaves thin, pubescent, not deltoid; rhizome scales needle-pointed and mostly black.....78. **Davallodes**  
 80. Leaves coriaceous or herbaceous, glabrous, often deltoid; rhizome scales not black, but brown or grey.....81  
 81. Indusium thin, free except at the base.....80. **Leucostegia**  
 81. Indusium broad, firm to coriaceous, attached by base only; rhizome scales not ciliate (or but slightly so).....81. **Humata**  
 81. Indusium attached at sides and base; rhizome scales ciliate with peltate, persistent bases.....82. **Davallia**  
 85. Walls of cells thick, coarsely pitted.....69. **Meringium**

## SPORANGIA IN MARGINAL SORI: ROUND, CUP-SHAPED, CONTINUOUS OR INTERRUPTED

82. Leaves so thin that there is no differentiation of foliar tissues.....83  
 82. Leaves thick enough to have epidermis and other tissues.....91  
 83. Indusium valvate.....84  
 83. Indusium tubular or obconic, not valvate.....87  
 84. Margin entire and naked.....85  
 84. Margin toothed.....86

85. Walls of cells not coarsely pitted . . . . . 68. **Mecodium**  
 86. Receptacle long, extruded; base of indusium obconic . . . . . 69. **Meringium**  
 86. Receptacle not long-exserted . . . . . 67. **Hymenophyllum**  
 87. Rhizome filiform, leaves remote . . . . . 88  
 87. Rhizome stout or fronds clustered . . . . . 90  
 88. False veinlets present . . . . . 89  
 88. False veinlets absent, segments 1-nerved . . . . . 71. **Vandenboschia**  
 89. Fronds pinnately divided or compound . . . . . 66. **Crepidomanes**  
 89. Fronds simple or lobed, with marginal vein . . . . . 70. **Microgonium**  
 90. Fronds 1-pinnate, oriental . . . . . 64. **Cephalomanes**  
 90. Fronds bipinnatifid to decompose . . . . . 71. **Vandenboschia**  
 91. Indusium distinctly 2-valved, rhizome covered with long, red, hair-scales; very large fern . . . . . 72. **Cibotium**  
 91. Indusium opening along or towards margin . . . . . 92  
 91. Indusium or marginal flap opening away from margin . . . . . 95  
 92. Sori usually continuous; leaf at most bipinnate . . . . . 93  
 92. Sori more or less round; leaf more compound . . . . . 94  
 93. Leaflets cut away on the lower side; veins free, forking . . . . . 75. **Lindsaya**  
 93. Veins anastomosing . . . . . 76. **Schizoloma**  
 94. Leaflets cuneate . . . . . 77. **Stenoloma**  
 94. Leaflets not cuneate (look out for *Davallia* and *Asplenium* with sori dorsal but indusia reaching the margin) . . . . . 75. **Dennstaedtia**  
 95. Leaves seriate on a creeping rhizome . . . . . 96  
 95. Leaves clustered . . . . . 98  
 96. Veins anastomosing with costal areoles . . . . . 93. **Histiopteris**  
 96. Veins free or with marginal vein . . . . . 97  
 97. Sori round on tips of free veins . . . . . 87. **Hypolepis**  
 97. Sori continuous, on marginal vein connecting free vein tips . . . . . 92. **Pteridium**  
 98. Petioles dark, polished . . . . . 99  
 98. Petioles not polished . . . . . 100  
 99. Sori on the inside of the reflexed leaf margin; leaflets cut away on the lower side, no white powder on under surface . . . . . 95. **Adiantum**  
 99. Sori on the tips of free veins, not on the reflexed margin; leaflets pinnatifid; usually white powder on under surface . . . . . 89. **Cheilanthes**  
 100. Sori never reach the midrib; coarse ferns . . . . . 94. **Pteris**  
 100. Sori apparently from margin to midrib; leaf very decompose . . . . . 91. **Onychium**

SPORANGIA IN SPIKE-LIKE, STROBILUS-LIKE, OR PANICLE-LIKE ARRANGEMENT

101. Climbing ferns, sporangia in strobilus-like marginal lobes or pinnae, with scale-like indusia covering each sporangium . . . . . 7. **Lygodium**  
 101. Not climbing, sporangia not in marginal strobili . . . . . 102  
 102. Veins reticulate, leaf simple, entire; sporangia in two rows in a narrow close spike; no annulus . . . . . 1. **Ophioglossum**  
 102. Veins free, leaves not simple, or if simple, then grass-like . . . . . 103  
 103. Sterile part of leaf palmately compound; long loose spike-like sporangiophore arising from the base of the sterile blade; sporangia in crested loose clusters, 3. **Helminthostachys**  
 103. Sterile part of leaf grass-like, linear, or dichotomously branched; sporangia in 2-4 rows covering one side of close distichous spikes at apex of sterile blade . . . . . 6. **Schizaea**  
 103. Sterile part of leaf pinnate to repeatedly pinnatifidly compound . . . . . 104  
 104. The entirely fertile pinnae never long-stalked . . . . . 5. **Osmunda**  
 104. The fertile pinnae always long-stalked sporangiophores . . . . . 2. **Botrychium**



GENERA SEPARATED FROM "DRYOPTERIS" AND "POLYSTICHUM" BY CHING AND CHRISTENSEN

105. Veins free (simple or forking, or with costal arch) . . . . . 106
105. Veins, at least the lowest, anastomosing by opposite pairs . . . . . 117
106. Indusium fugaceous or lacking . . . . . 107
106. Indusium present, persistent, obvious . . . . . 110
107. Very long needle-like but septate pale brown hairs on all parts of leaves . . . 27. **Lastreopsis**
107. Hairs not septate, or if septate, then only on upper side and not on all parts of leaves . . . 108
108. Veins simple, rarely forked after leaving the midrib of ultimate lobes, 26. **Thelypteris**
108. Veins forking in groups: the abaxial basal vein of each group comes from the costa of the pinna some distance below the midrib of the group (catadromous) . . . . . 109
109. Pinnae deeply pinnatifid, a tooth in each sinus . . . . . 19. **Pteridrys**
109. Pinnae not deeply pinnatifid; no teeth in the sinuses; very brittle . . . . . 16. **Microchlaena**
110. Margins prickly serrate; segments sharply auricled on the adaxial side of the base . . . 111
110. Margins not prickly serrate; segments not sharply auricled on adaxial side of base, 112
111. Leaves decompose, rhizome creeping, leaves distant, not gemmiferous at or near apex; anadromous arrangement of lowest pinnules of I, II, III orders, and of basal vein of ultimate pinnules . . . . . 13. **Rumorha**
111. Leaves pinnate to bipinnate, lanceolate to oblong; rhizome oblique or erect, leaves caespitose; often gemmiferous at or near apex . . . . . 14. **Polystichum**
112. Prominent deltoid, acute, callous tooth at each sinus between the segments of the pinnae as in *Bolbitis*; habit of *Pteris quadriaurita* . . . . . 19. **Pteridrys**
112. No callous tooth at the sinus . . . . . 113
113. Sori on abaxial branch only of forking vein; habit of *Tectaria* . . . . . 20. **Ctenitopsis**
113. Sori on unbranching lateral veins . . . . . 114
114. Multicellular, articulated, crisped, brown hairs on costa, costules, and midribs intermixed with clathrate scales with clear lumina in cells; dry leaves dry-brown or red-brown . . . . . 18. **Ctenitis**
114. No such articulated, crisped, brown hairs; cells of scales not with clear lumina; dry leaves usually pale green (except *D. sparsa* and *Hypodematium crenata*) . . . . . 115
115. Base of petiole swollen, covered with imbricating, bright, rufo-brown scales; no scales above base; blade densely pilose on both surfaces . . . . . 28. **Hypodematium**
115. Base of petiole not swollen, scales not limited to base, or if so, meager . . . . . 116
116. Indusium large, persistent, thick, round-reniform; rhizome erect or sometimes oblique, leaves caespitose; bases of costa and costules, and midribs decidedly decurrent; costa and costules deeply canaliculated above, with broken flexuous edges; stipe usually scaly; catadromous arrangement of lowest pinnules, . . . . . 12. **Dryopteris**
116. Indusium lacking, or small and reniform; rhizome creeping, leaves distant; costa, costules, and midribs not decurrent; grooved above, but not broken into by the lateral branches; stipe scaly only near base . . . . . 26. **Thelypteris**
117. Leaves pinnate or bipinnatifid with coadunate-pinnatifid apex; stellate or forked unicellular hairs absent; as a rule indusiate . . . . . 29. **Cyclosorus**
117. Leaves simple or imparipinnate, with the *mature* apical pinna usually being similar to the laterals; stellate or forked unicellular hairs sometimes present on rhizome scales and rachis . . . . . 118
118. Base of leaflets cordate; leaves often proliferous, scandent, and of indefinite growth; short stalked stellate or forked unicellular hairs present on rhizome scales and lower part of young rachis . . . . . 30. **Goniopteris**
118. Base of leaflets wedge-shaped or decurrent; leaves not proliferous or of indefinite growth; stellate or forked unicellular hairs absent; indusia none or if present generally small, thin, often hirsute and as a rule fugaceous . . . . . 31. **Abacopteris**

AN ENUMERATION OF THE FERNS OF BURMA AND  
THEIR DISTRIBUTION<sup>2</sup>

OPHIOGLOSSACEAE

1. *Ophioglossum* L.

- O. pedunculatum* Desv. Mingaladon—L. P. Khanna. First record for Burma.  
*O. pendulum* L. Tavoy, Hondraw River—Parish.

2. *Botrychium* Swartz

- B. lunaria* (L.) Sw. Adung Valley, Burma-Tibet frontier, 12,000 ft.—Ward 9986. First record for Burma.  
*B. lanuginosum* Wall. Loimwe, Kengung State—520; Taunggyi—Maymyo Herb. 576.

3. *Helminthostachys* Kaulfuss

- H. zeylanica* (L.) Hk. Tenasserim—Parish; Kamorta—Kurz; Katha Distt.—Maymyo Herb. 73.

ANGIOPTERIDACEAE

4. *Angiopteris* Hoffm.

- A. caudatififormis* Hieron. Mogok—108; Kengtung Territory—Rock 2323.  
*A. crassipes* Wall. Thandaung—6785. First record for Burma.  
*A. griffithiana* de Vriese. Mergui—Ind. Fil.  
*A. helferiana* de Vriese. Taungwine, Moulmein—6865; Pyinmana—7134. First record for Burma.

OSMUNDACEAE

5. *Osmunda* L.

- O. javanica* Bl. In bed of streams from Mt. Nwalabo, Tavoy—Parish; Bantai, Kengtund State—9260.  
*O. cinnamomea* L. Loimwe, Kengtung State—9104. First record for Burma.  
*O. japonica* Thunbg. Sin Lum Kaba, Bhamo Distt.—385; Haka, Boinu River Valley, Chin Hills—7476. First records for Burma.

SCHIZAEACEAE

6. *Schizaea* Smith

- S. malaccana* Baker. Burma—Ind. Fil.

7. *Lygodium* Sw.

- L. scandens* (L.) Sw. Taungwine, Moulmein—6848; Namkham, N. S. S.—45, 219; Stilwell Rd.—Young.  
*L. polystachyum* Wall. Madremacan, Mergui—Parish; Muang Len, Kengtung State—Rock 2017.  
*L. salicifolium* Presl. Namkham, N. S. S.—230, 233, 239, 44; Kengtung—9180; Manhsun, Manglon State—9756; Mogok—115, 116, 117. First records for Burma.  
*L. flexuosum* (L.) Sw. Mingaladon 615; Rangoon—43, 161, 168, 181, 467, 6533; Syriam—466; Moulmein—570, 576, 6846; Myawaddi to Kawkereik Hills, Lower Burma—Rock 678; Kengtung State—Rock 1975.  
*L. japonicum* (Thbg.) Sw. Namkham, N. S. S.—226, 231, 232, 234; N'Bapa—257, 258; Loimwe, Kengtung State—517; Mong Pawk, Kengtung State—9827; Kalaw—46; Mt. Popa—566; Taungwine, Moulmein—6846; Stilwell Rd.—Young 7.

<sup>2</sup>The nomenclature used in that of Christensen's Third Supplement to his Index Filicum (1936) unless otherwise stated under the individual genera. When the relationship of species is evident, this is indicated by their order in the enumeration; when the relationship is not evident, species are arranged alphabetically.

## GLEICHENIACEAE

8. *Dicranopteris* Bernhardt

(Ching 1940c)

- D. linearis* (Burm.) Underw. Amherst and Mergui—Parish; Kalaw—14; Thandaung—14B; Namkham—14A; Mogok—3005; Sin Lum Kaba—335; Loimwe—533, 9129; Stilwell Rd.—Young 25.
- D. splendida* (Hand. & Mazz.) Ching. Thandaung—50; Loimwe—533. First records for Burma.

9. *Hicriopteris* Presl

(Ching 1940c)

- H. glauca* (Thbg.) Ching. Nattaung Mt.—Parish; Sin Lum Kaba—297, 322; Stilwell Rd.—Young 66.
- H. laevissima* (Christ) Ching. Sin Lum Kaba—283. First record for Burma.

## CYATHEACEAE

10. *Cyathea* Smith

(Copeland 1909, Holttum 1935)

- C. brunoniana* (Wall.) Cl. & Bak. Between Sadon and the Yunnan border—Rock 7464.
- C. contaminans* (Wall.) Copel. Kengtung State—Rock 2097, 2087; Mogok—133A.
- C. decipiens* (Scott) Cl. & Bak. Mogok—133. First record for Burma.
- C. gigantea* (Wall.) var. or sp. nov. Loimwe, Kengtung State—9123. First record for Burma.
- C. glabra* (Bl.) Copel. Kengtung State—Rock 2032, 2041, 2153, 2341; Mts. in Tenasserim—Parish; Taungyeghat, Pegu Distt.—328.
- C. khasyana* (Moore) Copel. Between Sadon and Yunnan border—Rock 7431; Khunpoye, Kungtung State—9247.
- C. latebrosa* (Wall.) Copel. Mergui—Maymyo Herb.
- C. oldhami* (Bedd.) Copel. Moulmein—Clarke & Beddome; Mooleyit—Parish.
- C. spinulosa* Wall. Namkham—619, 20. First record for Burma.
- C. umbrosa* Holttum. Taungwine, Moulmein—8854. First record for Burma.

## PERENEMACEAE Presl, emend.

(Ching 1940b)

11. *Diacalpe* Blume

- D. aspidioides* Bl. Mooleyit, Tavoy—Beddome and Clarke; Mt. Nwalabo, Tavoy—Parish; Moulmein—Clarke; Mogok—125; Namkham—252, 260; Sin Lum Kaba—305, 307; Bantai, Kengtung State—9252.

## ASPIDIACEAE Presl, emend.

(Ching 1940b)

## TRIBE 1. DRYOPTERIDEAE

12. *Dryopteris* Adanson, sensu propria.

(Ching 1938c)

- D. scottii* (Bedd.) Ching. Sin Lum Kaba—358, 376; Haka, Chin Hills—7415.
- D. stenolepis* (Bak.) C. Chr. Kambaiti Valley—Rock 7507; Namkham—321.
- D. atrata* (Wall.) Ching. Kengtung State—Rock 2207; Kengtung—9236; Sin Lum Kaba—330; Falam, Chin Hills—7254; Haka, Chin Hills—7505, 7370.
- D. paleacea* (Sw.) C. Chr. Between Sadon and the Yunnan border—Rock 7506; Sin Lum Kaba—334, 391; Haka, Chin Hills—7510.
- D. odontoloma* (Moore) C. Chr. Sin Lum Kaba—333; Taungteik, Chin Hills—7247; Haka, Chin Hills—7708; Stilwell Rd.—Young. First records for Burma.
- D. chrysocoma* (Christ) C. Chr. Mt. Popa—545, 6614. First records for Burma.
- D. cochleata* (Don) C. Chr. Kengtung State—Rock 2265, 2245; Kengtung—9173, 9174, 9174A; Taunggyi—178; Mt. Popa—547; Kalemmyo, Chin Hills—7220, 604.
- D. labordei* (Christ) C. Chr. Namkham—229. First record for Burma.

- D. marginata* (Wall.) Christ. Between Sadon and the Yunnan border—Rock 7504.  
*D. angustifrons* (Moore) C. Ktze. Burma—Mebold.  
*Dryopteris sparsa* (Ham.) Ktze. Tenasserim Distt.—Parish; Sadon to Yunnan border—Rock 7503; Sin Lum Kaba—277, 345, 411; Mogok—328; Namkham—12, 311; Pangwai, Kengtung State—9239, 9103, 9131; Stilwell Rd.—Young 51.  
*D. hendersoni* (Bedd.) C. Chr. Namkham—240, 250. First records for Burma.

13. **Rumohra** Raddi  
(Ching 1934b)

- R. assamica* (Kuhn) Ching. Stilwell Rd., Burma-Assam border—Young. First record for Burma.  
*R. aristata* (Forst.) Ching. Burma—Parish; Stilwell Rd.—Young 84.  
*R. speciosa* (Don) Ching. Namkham—255, 301; Pangwai, Kengtung State—9201. First records for Burma.  
*R. simulans* Ching. Namkham—317; Nawng Heng, Burma-Yunnan border 292. First records for Burma.  
*R. henryi* (Christ) Ching. Kengtung State—Rock 2233; Sin Lum Kaba—340.  
*R. diffracta* (Bak.) Ching. Loimwe, Kengtung State—9120; Nam Tamai Valley, 4000 ft.—Ward 9159. First records for Burma.

14. **Polystichum** Roth.

- P. thompsoni* (Hk. f.) Bedd. Adung River, Burma-Tibet frontier—Ward 9186. First record from Burma.  
*P. deltodon* (Bak.) Diels. Maymyo—7. First record for Burma.  
*P. obliquum* (Don) Moore. Goteik Gorge—212. First record for Burma.  
*P. auriculatum* (L.) Presl. Stilwell Rd.—Young.  
*P. neolobatum* Nakai (?). Taungteik, Chin Hills—7541. First record for Burma.  
*P. attenuatum* Ching. Namkham—30, 253; Mogok—104; Sin Lum Kaba—332. First records for Burma.  
*P. chunii* Ching. Namkham—259, 303. First records for Burma.  
*P. pseudotsus-simense* Ching. Burma-Ind. Fil. III.  
*P. biaristatum* (Bl.) Moore. Kengtung State—Rock 2116, 2117, 2309; Sin Lum Kaba—403.  
*P. biaristatum* form. Sin Lum Kaba—359.  
*P. setiferum* (Forsk.) Moore. Mogok—128, 145; Chin Hills; Falam—7276; Yetagone—7542; Taungteik—7299.  
*P. setiferum* (Forsk.) Moore var. or sp. Falam—7280.  
*P. setiferum* (Forsk.) Moore var. or sp. Falam—7302, 7303, 7372; Haka—7509.  
*P. yunnanense* Christ. Sin Lum Kaba—358?; Mogok—129?; Haka—7508, 7782, 7784; between Sadon and Yunnan border—Rock 7521.  
*P. punctiferum* C. Chr. Between Sadon and Yinan border—Rock 7522.

15. **Cyclopeltis** J. Smith

- C. presliana* (J. Sm.) Berkeley. Burma—Ind. Fil.

16. **Microchlaena** Ching  
(Ching 1938b)

- M. yunnanensis* (Christ) Ching. Kengtung State—Rock 2212; Pangwai, Kengtung State—9195, 9243; N'Bapa—270.

17. **Cyrtomium** Presl

- C. hookerianum* (Presl) C. Chr. Sin Lum Kaba—352. First record for Burma.

TRIBE 2. ASPIDIEAE

18. **Ctenitis** C. Chr.

- C. clarkei* (Bak.) Ching. Between Sadon and the Yunnan border—Rock 7405.  
*C. rhodolepis* (Cl.) Ching. Maymyo—425; Taunggyi—9322. First records for Burma.

19. **Pteridrys** C. Chr. & Ching

- P. australis* Ching. Valley of the Meh Len, Kengtung State—Rock 2141.

*P. cnemidaria* (Christ) Ching. Tenasserim Distt.—Parish; Kengtung State—Rock 2140; Taunggyi—9291.

20. *Ctenitopsis* Ching  
(Ching 1938b)

*C. sagenioides* (Mett.) Ching. Tenasserim—Parish.

*C. fuscipes* (Wall.) Ching. Taungup—Lace 2936; Pyinmana—7121; Zwagabin, Moulmein Distt.—7022.

*C. setulosa* (Bak.) Ching. Khunpoye, Kengtung State—9259. First record for Burma.

21. *Egenolfia* Schott  
(Ching 1931d)

*E. appendiculata* (Willd.) J. Sm. Tenasserim—Parish; Taungwine, Moulmein—6849; Pyinmana—7120; Stilwell Rd.—Young.

*E. sinensis* (Bak.) Maxon. Moulmein (?)—6621, 6657, Pyinmana—7130; Loimwe, Kengtung—9140. First records for Burma.

*E. bipinnatifida* J. Sm. Tenasserim—Parish; Moulmein—6751.

*E. helferiana* (Kunze) C. Chr. Oktada, Martaban Hills, Kalama Range—Rock 759; Kyain, Amherst Distt.—6867.

*E. helferiana* var. *incisa*. Lower Burma—Rock 759.

*E. nodiflora* (Bory) Fée. Mawlaik, Upper Chindwin Distt.—Rock 823; type from Pegu.

22. *Tectaria* Cav.  
(Ching 1931f)

*T. polymorpha* (Wall.) Copel. Moulmein—Parish 145; Thandaung—6750; Goteik Gorge—209; Namkham—9,236; N'Bapa—272; Kengtung—9167; Rock 1954, 2084, 2090.

*T. heterosora* (Bak.) Ching. Stilwell Rd.—Young.

*T. tenerifrons* (Hk.) Ching. Moulmein—Parish 92 (type).

*T. chattagramica* (Cl.) Ching. Sandwut—Lace 4799, 5178.

*T. vasta* (Bl.) Copel. Kengtung State—Rock 1938, 1957, 2132, 2139.

*T. subtriphylla* (Hk. & Arn.) Copel. Burma. Parish; Htam Sang Caves, Hopong State—8094.

*T. subtriphylla* (Hk. & Arn.) Copel. var. *appr.* T. Rockii. Zwagabin, Moulmein—7043; Goteik Gorge—208.

*T. rockii* C. Chr. Goteik Gorge—Lace 4857 (1909); 208A, 9525; Takaw Ferry—9288; Sampu, Namkhok State—8345; Kanpetlet, Chin Hills—8570.

*T. irregularis* (Presl) Copel. Tenasserim—Parish.

*T. irregularis* (Presl) Copel. var. *difformis* Bl. Mergui—Maymyo Herb. Kyaukthanba, Pyinmana—7121.

*T. subpedata* (Harr.) Ching. Namkham—28.

*T. decurrens* (Presl) Copel. Goteik Gorge—Lace 4993 (1909).

*T. variolosa* (Wall.) C. Chr. Tavoy—7977, Moulmein—567, 6844; Pegu-Clarke; Syriam—462; Mt. Popa—6626 (?).

*T. ebenina* (C. Chr.) Ching. Kalemmyo—7219; Tiddim, Chin Hills—623 (?).

*T. coadunata* (Wall.) Ching. Moulmein—Parish, Maymyo Herb. 561.

*T. multicaudata* (Wall.) Ching. Moulmein and Mergui—Beddome; Chappedaung—Wallich.

23. *Bolbitis* Schott

*B. contaminans* (Wall.) Ching. Burma—Beddome.

*B. deltiagera* (Wall.) C. Chr. Zwagabin, Moulmein—7029; Yetagone, Chin Hills—7766.

*B. heterochita* (Presl) Ching. Tenasserim Distt.—Parish.

*B. scalpturatus* (Fee) Ching. Tenasserim Distt.—Parish.

*B. undulata* (Wall.) Ching. Martaban—Parish (1827); Zwagabin, Moulmein—7014; Thandaung (?)—6711.

24. *Stenochlaena* J. Smith

*S. palustris* (Burm.) Bedd. Tenasserim—Parish; Moulmeingyun, Henzada—6903; Rangoon—6537; Thandaung—58.

*S. sorbifolia* (L.) J. Sm. Tenasserim—Beddome; Packchan—Parish.

25. **Lomagramma** J. Smith  
(Holtum 1937b)

*L. matthewii* (Ching) Holtum. Salween River, Road to Kengtung—9289. First record for Burma.

THELYPTERIDACEAE Ching  
(Ching 1940b)

TRIBE 1. THELYPTERIDEAE

26. **Thelypteris** Schmidel  
(Ching 1936c)

- T. aurita* (Hk.) Ching. Upper Burma—G. Forrest.  
*T. oppositipinna* (v.A.v.R.) Ching. Sin Lum Kaba—357. First record for Burma.  
*T. brunnea* (Wall.) Ching. Namkham—274, 312. First records for Burma.  
*T. chlamydophora* (Rosenst.) Ching. Burma—Ind. Fil. III.  
*T. ciliata* (Wall.) Ching. Kengtung State—Rock 2185, 2206; Valley of the Nam Tamai, Burma-Tibet frontier—Ward 9117; Stilwell Rd.—Young 7; Thandaung—6782.  
*T. erubescens* (Wall.) Ching. Falam, Chin Hills—7270, 7271; Haka, Chin Hills—7390, 7413. First records for Burma.  
*T. tuberculifera* (C. Chr.) Ching. Kalaw—13A; Taunggyi—176; Loimwe, Kengtung State—9106; Falam, Chin Hills—7239; Haka, Chin Hills—7611. First records for Burma.  
*T. xyloides* (Kze.) Ching. Kengtung State—Rock 2234; Loimwe—523 (?); Mogok—154; Sin Lum Kaba—276; Falam, Chin Hills—7250.  
*T. falciloba* (Hk.) Ching. Kengtung State—Rock 2082; Kengtung—9182, 9225; Maymyo—8; Mogok—143.  
*T. ochthodes* (Kze.) Ching. Thandaung—6778; Kalaw—13; Loimwe, Kengtung—9106A; Mogok—148; Haka, Chin Hills—7573. First records for Burma.  
*T. duclouxii* (Christ) Ching. Burma—Maymyo Herb. 566. First records for Burma.  
*T. glanduligera* (Kze.) Ching. Sin Lum Kaba—459 (probably). First record for Burma.  
*T. flaccida* (Bl.) Ching. Sin Lum Kaba—379. First record for Burma.  
*T. uliginosa* (Kze.) Ching. Anisakan—427; Mt. Popa—6619. First records for Burma.  
*T. ornata* (Wall.) Ching. Burma—Parish; East of Bhamo—Rock 7842.

27. **Lastreopsis** Ching

*L. parishii* (Hk.) O. Ktze. Moulmein—Parish.

28. **Hypodematium** Kunze  
(Ching 1935b)

*H. crenatum* (Forsk.) Kuhn. Anisakan—422, 428; Mt. Popa—548, 6620; Yetagone, Chin Hills—7333. First records for Burma.

TRIBE 2. GONIOPTERIDEAE

29. **Cyclosorus** Link  
(Ching 1938a)

- C. crinipes* (Hk.) Ching. Kengtung State—Rock 2089; Yanka, Kengtung—9234; Mong Nai, S. S. S.—7852; Takaw Ferry—9287; Sin Lum Kaba—347; Mogok—151; Kyaukthanba, Pyinmana—7125.  
*C. extensus* (Bl.) Ching. Tenasserim—Parish.  
*C. multijugus* (Bak.) F. G. D. Falam, Chin Hills—7289. First record for Burma.  
*C. interruptus* (Willd.) Ching. Tenasserim Distt.—Parish; Kyauktalon, Moulmein Distt.—6837; 6842; Mt. Popa—6604; Goteik Gorge—204.  
*C. gongyloides* (Schkuhr.) Link. Kyain, Moulmein—6859; Mingaladon—603; Inle Lake, S. S. S.—187, 7880; Kengtung—9190. First records from Burma.  
*C. molliusculus* (Wall.) Ching. Kengtung State—Rock 3187, 2189.  
*C. parasiticus* (L.) Farwell. Thandaung—66; Namkham—300; Pangwai, Kengtung State—9203. First records for Burma.

- C. subpubescens* (Bl.) Ching. Kyauktalon, Moulmein—6837A, 6840, 6841; Kyain, Moulmein—6858; Mt. Popa—6627A; Rangoon—188, 6627; Maymyo—415, 423; Goteik Gorge—210; Namkham—222; Falam, Chin Hills—7248; Pyinmana—7109.
- C. burmanicus* Ching. Kengtung State—Rock 2247.
- C. meeboldi* (Rosenst.) Ching. Tenasserim—Meebold 2152 (type).
- C. truncatus* (Poir.) Farwell. Kengtung State—Rock 1966; Yanka, Kengtung State—9226 sens lat.
- C. hirtisorus* (C. Chr.) Ching. Kengtung State—Rock 2208 (type), 2235; Loimwe, Kengtung—514; Mogok—55A (?).
- C. subelatus* (Bak.) Ching. Kengtung State—Rock 2113; Kengtung—9185, 9185A; Mogok—152; Namkham—323, 324.

30. *Goniopteris* Presl

(Ching 1938a)

- C. prolifera* (Retz) Presl. Mergui—Hope; Kengtung State—Rock 2115; N'Bapa—288; Kalemyo—7202; Tiddim, Chin Hills—601.

31. *Abacopteris* Fee emend.

(Ching 1938a)

- A. triphylla* (Sw.) Ching. Tenasserim—Parish; Kyain, Amherst Distt.—6866; Stilwell Rd.—Young 39.
- A. triphylla* var. *parishii* (Bedd.) Ching. Tenasserim—Beddome.
- A. rubra* Ching. Thandaung—54, 6787; Loimwe, Kengtung—532, 9122.
- A. rubra* var. *hirsuta* Ching. Kengtung State—Rock 2136; Maymyo 41; Stilwell Rd.—Young 33.
- A. prestiana* Ching. Namkham—246; Yetagone, Ching Hills—7309.
- A. multilineatum* (Wall.) Ching. Moulmein—Parish; Kyain, Amherst Distt.—6856; Sin Lum Kaba—339; Namkham—39, 237; N'Bapa—304; Kengtung State—Rock 1936, 1938, 2142.
- A. penangiana* (Hk.) Ching. Maymyo—412, 421A, 421 (?). First records from Burma.

## ASPLENIACEAE Presl

(Ching 1940b)

## TRIBE I. ATHYRIEAE

32. *Athyrium* Roth.

- A. acrostichoides* (Sw.) Diels. Sin Lum Kaba—266. First record for Burma.
- A. atkinsoni* Bedd. Sin Lum Kaba—354. First record for Burma.
- A. australe* (R. Br.) Presl. Burma—Beddome.
- A. boryanum* Tagawa (= *Dryothyrium* Ching). Toungoo—Maymyo Herb. 565.
- A. brevisorum* (Wall.) Moore. Taungdong Mts. near Ava—Wallich.
- A. dissitifolium* (Bak.) C. Chr. Kengtung State—Rock 2666, Rock 2691; Loimwe—511, 512, 9208; Taunggyi—179, 9390; Kalaw—23; Maymyo—418 (?); Falam, Chin Hills—7351; Haka, Chin Hills—7570.
- A. dissitifolium* f. *subbipinnata*. Tiddim Chin Hills—600; Haka—7694.
- A. drepenopterum* (Kze.) R. Br. Between Sadon and Yunnan border—Rock 4776; Mogok—112, 144.
- A. drepenopterum* var. *funebre* Christ. Between Sadon and Yunnan border—Rock 7477.
- A. falcatum* Bedd. Mt. Popa—541. First record for Burma.
- A. macrocarpum* (Bl.) Bedd. Near Kambaiti—Rock 7484.
- A. nigripes* (Bl.) Moore. Between Sadon and Yunnan border—Rock 7519.
- A. niponicum* (Mett.) Hance. Taunggyi—177, 177A. First record for Burma.
- A. procerum* (Wall.) Milde. Mogok—131; N'Bapa—280, 286; Haka, Mossy Forest—7511. First records for Burma.
- A. setiferum* C. Chr. Between Sadon and Yunnan border—Rock 7518, Rock 7520.
- A. spectabile* (Wall.) Presl. Goteik Gorge—211; Takaw, Kengtung State—9286. First records for Burma.
- A. strigillosum* Moore. Between Sadon and Yunnan border—Rock 7420 (?).

33. *Cystopteris* Bernhardi

*C. tenuisecta* (Bl.) Mett. Moulmein Mts.—Bedd.; Mooleyit, Tavoy—Parish.

34. *Diplaziura* Swartz

*D. bantamense* Bl. Tenasserim—Parish; Stilwell Rd.—Young.

*D. dilatatum* Bl. f. *diversifolium* (Wall.) Kengtung State—Rock 2134.

*D. dilatatum* Bl. f. *latifolium* (Don). Kengtung State—Rock 2036, Rock 2184; between Sadon and Yunnan border—Rock 7443; Loinwe—9141A; Mogok—102, 149, 342.

*D. esculentum* (Retz) Sw. Kengtung State—Rock 2114; Teeyang, Tenasserim Distt.—Parish; Tavoy—8015; Kyain, Amherst Distt.—6857; Kalemyo—7228.

*D. japonicum* (Thbg.) Bedd. Stilwell Rd.—Young 78.

*D. lanceum* (Thbg.) Presl. Stilwell Rd.—Young 7. First record for Burma.

*D. leptophyllum* (Bak.) Christ. Kengtung—9172A; Haka, Chin Hills—7572. First records for Burma.

*D. lobbianum* (Hk.) Moore. Kengtung State—Rock 1937.

*D. megaphyllum* (Bak.) Christ. Salween River at Kengtung Road—9290. First record for Burma.

*D. opacum* (Don) Christ. Loinwe, Kengtung State—9141. First record for Burma.

*D. pallidum* (Bl.) Moore. Tenasserim—Parish.

*D. peterseni* Kze. Thandaung (?)—6736. First record for Burma.

*D. polypodioides* Bl. Between Sadon and Yunnan border—Rock 7434; Takaw, Kengtung State—9294; Haka, Chin Hills—7482.

*D. siamense* C. Chr. f. *acuminata*. Loimwe, Kengtung—506. First record for Burma.

*D. sikkimense* (Cl.) C. Chr. Kengtung State—Rock 2183.

*D. silvaticum* (Bory) Sw. Chappedong Hill, Burma—Clarke.

*D. tomentosum* Bl. Tenasserim—Parish.

*D. viridissimum* Christ. Kengtung State—Rock 2131.

35. *Diplaziopsis* C. Chr.

*D. javanica* (Bl.) C. Chr. Stilwell Rd.—Young 29. First record for Burma.

## TRIBE 2. ASPLENIEAE

36. *Phyllitis* Hill

*P. delavayi* (Franch) C. Chr. Upper Burma—Ind. Fil.

37. *Thamnopteris* Presl.

*T. nidum* L. Tenasserim Distt.—Parish; beyond Sadon near Yunnan border—Rock 7467; Loiye, Bhamo Distt.—410; Yanka, Kengtung State—9229.

*T. phyllitidis* (Don) Presl. Kengtung State—Rock 2181.

*T. grevillei* (Wall.) Moore. Tavoy Island—Parish.

38. *Asplenium* L.

*A. ensiforme* Wall. Ta-ok—Parish; Tennasserim—Hope; Moulmein—Clarke; Nattaung, Karenni—9457; Ashe-myin-Anauk-myin, Lawk Sawk State—8703, 8717; Sampu, Namkhok State—8359; Mt. Victoria, Chin Hills; 8595, 8598; Mogok, Taungme—110; Sin Lum Kaba—402; N'Bapa—209; Pangyang, Manglun State—8071; Adung Valley, Burma-Tibet frontier—Ward 9334.

*A. griffithianum* Hk. Mergui and Tavoy—Beddome; Stilwell Rd.—Young 64; Burma-Tibet frontier, Nam Tamai Valley—Ward 9165.

*A. amboinense* Willd. Mergui and Tavoy—Parish.

*A. normale* Don. Ta-ok—Parish; Loimwe, Kengtung State—9121; Stilwell Rd.—Young 82.

*A. normale* var. *minus*—Kambaiti—Rock 7508.

*A. longissimum* Bl. Moulmein southwards—Parish.

*A. wightianum* Wall. Burma—Beddome.

*A. tenerum* Forst. Tenasserim Distt.—Parish.

*A. pellucidum* Lam. Madremacan Is., Nergui—Parish; Moulmein—Bedd.



- A. cheilosorum* Kunze. Zwakabin—Parish; Nattaung, Karrenni—9479, 9418; between Sadon and Yunnan border—Rock 7425; Stilwell Rd.—Young 89.
- A. unilaterale* Lam. Zwegababin, Moulmein—7024; Nattaung, Karrenni—9477; Mt. Popa—6602.
- A. unilaterale* var. *rahaense* (Yabe) Hay. Between Pang Ma Ki Hat and the Siamese border—Rock 1947; Stilwell Rd.—Young 12.
- A. unilaterale* var. *delicatulum* Par. Mergui—Parish; Ta-ok—Parish.
- A. unilaterale* var. *udum* Atk. Htam Sang Caves, Hopong State—8269; Sampu, Namkhok State—8291; Mt. Victoria—8456, 8498, 8568; Haka—7574; Stilwell Rd.—Young 68.
- A. adiantoides* (L.) C. Chr. Moulmein southwards—Clarke; Hopong, Hopong State—8264 (?), 8087 (?).
- A. macrophyllum* Sw. Stilwell Rd.—Young 16. First record for Burma.
- A. urophyllum* Wall. Henzada—6900. First record for Burma.
- A. exiguum* Bedd. Kalaw—15; Taunggyi—8093, 9391. First records for Burma.
- A. rockii* C. Chr. Near N'Bapa ford, Burma-Yunnan border 290A. First record for Burma.
- A. laciniatum* Don. Kalaw—16; between Sadon and Yunnan border—Rock 7422.
- A. planicaule* Wall. Between Sadon and Yunnan border—Rock 7417; Mogok—103, 120; Taunggyi—9313; Thandaung 6714A; Haka, Chin Hills—7366, 7556, 7579.
- A. crinicaule* Hance. Mt. Nwalabo, Tavoy Distt. (?)—8245; Sin Lum Kaba—398; Stilwell Rd.—Young. First records for Burma.
- A. praemorsum* Sw. Thandaung—6714. First record for Burma.
- A. nitidum* Sw. Tenasserim Distt.—Parish.
- A. cuneatum* Lam. Stilwell Rd.—Young. First record for Burma.
- A. bullatum* Wall. Adung Valley, Burma-Tibet frontier—Ward 9185.
- A. tenuifolium* Don. Kalamataung, Martaban—Parish; Bernardmyo, Mogok—123; Mt. Victoria, Chin Hills—8515; Ashe-myin Anauk-myin, Lawk Sawk State—8709; Sampu, Namkhok State—8332; Pangwai, Kengtung State—9215; Panyang, Manglun State—8073.
- A. schilleifolium* (Lam.) C. Chr. Maymyo Herb. 588.

39. **Ceterach** Garsault

- C. paucivenosa* Ching. Adung Valley, Burma-Tibet frontier—Ward 9230. First record for Burma.

OLEANDRACEAE Ching  
(Ching 1940b)40. **Oleandra** Cav.

- O. cumingii* J. Sm. Taungwine Range, Moulmein—Parish; Madremacan, Mergui—Parish.
- O. musifolia* (Bl.) Presl. Thandaung—60. First record for Burma.
- O. neriformis* Cav. Dauna-taung east of Moulmein—Parish.
- O. undulata* (Willd.) Ching. Moulmein—Baker; Kengtung State—Rock 2026.
- O. wallichii* (Hk.) Presl. Burma—Beddome.

BLECHNACEAE Ching  
(Ching 1940b)

## TRIBE 1. BLECHNEAE

41. **Blechnum** L.

- B. orientale* L. Moulmein—Parish; Taungwine, Moulmein—6350; Kyain, Amherst Distt.—6855; Taung Thonta, Tavoy—8011; Rangoon—8131; Thandaung—59; Mogok—620; Namkham—4, 18, 19, 223; Panyang, Manglun State—8084.

## TRIBE 2. WOODWARDIEAE

42. **Woodwardia** Smith  
(Ching 1931a)

- W. japonica* (L.) J. E. Smith. Kengtung State—Rock 2006; Loimwe, Kengtung State—9102.
- W. unigemmata* Nakai. Adung Valley, Burma-Tibet frontier—Ward 9309. First record for Burma.

## TRIBE 3. BRAINEAE

43. *Brainea* J. Sm.

- B. insignis* (HK.) J. Sm. Mooleyit, Tavoy—Parish; Yunzalin Mts.—Parish; Mogok—139; east of Pangyang, Manglun State—very common, trunks 3 ft. high; Loimwe—9235; Kengtung State—Rock 2028.

## PLATYCERACEAE Ching

(Ching 1940b)

44. *Platyserium* Desv.

- P. coronarium* (Konig) Desv. Mergui and Islands—Parish.  
*P. wallichii* Hk. Tenasserim—Beddome; Taungwine, Moulmein—Parish; Moulmein—31; Pinyinmana—500; Thandaung—8397; Anisakan, Maymyo—419; Kalemwo—7223; Bhamo.

## GRAMMITACEAE Presl emend.

(Ching 1940b)

45. *Ctenopteris* Blume

- C. khasyana* (Hk.) Dickason. Nam Tamai Valley, Upper Burma—Ward 9146. First record for Burma.  
*C. subfalcata* (Bl.) Dickason. Between Sadon and Yunnan border—Rock 7400; Nattaung, Karenni—9460; Haka, mossy forest—7578.

## POLYPODIACEAE Presl (sensu propria)

(Ching 1940b)

## SUBFAMILY 1. POLYPODIOIDEAE

45. *Polypodium* L.

(Ching 1933d)

- P. manmeiense* Christ. Taunggyi—471, 8112, 8115, 9050; Loimwe, Kengtung State—534; Pangyang, Manglun State—8059; Nattaung, Karenni—9458. First records for Burma.  
*P. microrhizoma* Clarke. Maymyo Herb. 25678.  
*P. nipponicum* Mett. Burma—Ind. Fil.  
*P. amoenum* Wall. Between Sadon and Yunnan border—Rock 7455; Pangyang, Manglun State—8058; Nattaung, Karenni—9471; Mogok—137; Sin Lum Kaba—375; Stilwell Rd.—Young 83.  
*P. argutum* Wall. Between Sadon and Yunnan border—Book 7500.  
*P. pseudocannatum* Copel. Kyaukme Taung, Tavoy Distt.—8009.  
*P. subauriculatum* Bl. Tenasserim Distt.—Parish.  
*P. beddomei* Bak. Waytamargay, S. S. S.—Parish.

## SUBFAMILY 2. PLEOPELTIOIDEAE

47. *Neocheiropteris* Christ

(Ching 1933b)

- N. ensata* (Thbg.) Ching. Stilwell Rd.—Young 11. First record for Burma.  
*N. phyllomanes* (Christ) Ching. Htam Sang Caves, Hopong State—8268; Namkham—40; Kanpetlet, Chin Hills—8429; Yetagone, Chin Hills—7752. First records from Burma.  
*N. lancifolia* (Alston) Dickason. Nam Tamai, Upper Burma—Ward 9172 (type).

48. *Lepisorus* (J. Sm.) Ching

(Ching 1933b)

- L. contortus* (Christ) Ching. Sin Lum Kaba—633; Kalaw—629. First records for Burma.  
*L. excavatus* (Bory) Ching var. *scolopendrinum* (Ham.) Ching. Maymyo Herb.—1774; Sin Lum Kaba—365 probably. First records for Burma.  
*L. macrosphaerus* (Bak.) Ching. Kalaw—631; Sin Lum Kaba—367, 371, 377. First records from Burma.  
*L. macrosphaerus* var. *asterolepis* (Bak.) Ching. Taunggyi—8378, 9047; Sampu, Namkhok State—8363; Molahein Mt., Lawk Sawk State—8744; Mt. Popa—563; Mt. Victoria—8486,

- 8590; Falam, Chin Hills—7244; Haka, Chin Hills—7399, 7418, 7598. First records for Burma.
- L. obscure-venulosus* (Hay.) Ching. Kalaw—630, 628 (near). First records for Burma.
- L. oligolepidus* (Bak.) Ching. Between Sadon and Yunnan border—Rock 7494; Thandaung—6726.
- L. oosphærus* (C. Chr.) Ching. Kalaw—9592; Taunggyi—8125, 8786, 9048; Loimwe, Kengtung State—502. First records for Burma.
- L. pseudonudus* Ching. Between Sadon and Yunnan border—Rock 7498; Thandaung—6786.
- L. sinensis* (Christ) Ching. Between Sadon and Yunnan border—Rock 7488; Lin Lum Kaba—364.
- L. sordidus* (C. Chr.) Ching *forma rostrata* (C. Chr.) Ching. Between Sadon and Yunnan border—Rock 7509.
- L. subconfluens* Ching. Namkham—302A (?). First record for Burma.
- L. sublinearis* (Bak.) Ching. Between Sadon and Yunnan border—Rock 7424; Loi Maing, Sampu, Namkhok State—8364; Haka, Chin Hills—7558, 7576.
- L. sublinearis* var. Kalaw—4. First record for Burma.
- L. thunbergianus* (Klf.) Ching. Between Sadon and Yunnan border—Rock 7421; Sin Lum Kaba—633; Mogok-Bernardmyo Rd.—172; Namkham—632; Mt. Popa—560; Thandaung—51.

49. **Hymenolepis** Kaulfuss  
(Christensen 1929)

- H. henryi* Hieron. Stilwell Rd.—Young. First record for Burma.

50. **Lemmaphyllum** Presl  
(Christensen 1929)  
(Ching 1933b)

- L. subrostratum* (C. Chr.) Ching. Dauna Taung, east of Moulmein—Parish; Sampu, Namkhok State—8353; between Sadon and Yunnan border—Rock 7493; Falam, Chin Hills—7273; Stilwell Rd.—Young 9.

TRIBE 2. PHYMATODEAE

51. **Phymatodes** Presl  
(Ching 1933d)

- P. griffithiana* (Hk.) Ching. Between Sadon and Yunnan border—Rock 7528; Yatagone, Chin Hills—7350.
- P. rhyncophylla* (Hk.) Ching. Dauna Taung, Parish; Mooleyit, Tenasserim—Beddome; between Sadon and Yunnan border—Rock 7513; Loije—Sin Lum Kaba Rd.—390; Nattaung, Karenni—9453.
- P. crenato-pinnata* (Cl.) Ching. Kalaw—9588; Taunggyi—181, 8771; Loimwe, Kengtung State—526. First records for Burma.
- P. trisecta* (Bak.) Ching. Maymyo Herb.
- P. oxyloba* (Wall.) Presl. Daung Taung—Parish; Thandaung—53; Nattaung, Karenni—9452; Molahein Mt., Lawksawk State—8760; Pangyang, Manglun State—8066; Loimwe, Kengtung State—525; Tiddim, Chin Hills—626.
- P. sp. nov.* Mt. Popa—538. First record for Burma.
- P. lucida* (Roxb.) Ching. Kalaw—27, 405; Sin Lum Kaba—341. First records for Burma.

52. **Selliguea** Bory emend.  
(Ching 1933c)

- S. fée* Bory. Tenasserim and Mergui—Parish.

53. **Microsorium** Link  
(Ching 1933c)

- M. normale* (Don) Ching. Mooleyit, Tenasserim—Beddome; Mergui—Parish; between Sadon and Yunnan border—Rock 7510; Sampu, Namkhok State—8338; Ashe-myin Anaukmyin, Lawksawk State—8702.

- M. hymenodes* (Kze.) Ching. Yetagone, Chin Hills—7754; Stilwell Rd.—Young. First records from Burma.
- M. superficiale* (Bl.) Ching. Between Sadon and Yunnan border—Rock 7497; Sin Lum Kaba—400; Pangwai, Kengtung State—9202; Taungteik, Chin Hills—7298.
- M. punctatum* (L.) Copel. Kengtung State—Rock 2138; Bhamo—412; Goteik Gorge—207; Hrawng Vung, Haka, Chin Hills—7637; Moulmeingyun—6913; Moulmein—6852; Tavoy—7986.
- M. zippelii* (Bl.) Ching. Sin Lum Kaba—408. First record for Burma.
- M. membranaceum* (Don) Ching. Tenasserim Distt.—Parish; between Sudan and Yunnan border—Rock 7478; Thandaung—52. Taunggyi—8118, 9029.
- M. hancockii* (Bak.) Ching. Tenasserim—Parish; Kengtung State—Rock 2135; Loimwe, Kengtung State—9143.
- M. zosteriforme* (Wall.) Ching. Mooleyit, Tenasserim—Parish.
- M. pteropus* (Bl.) Ching. Kyain, Amherst Distt.—6866A; Stilwell Rd.—Young 32.

54. *Colysis* Presl  
(Ching 1933c)

- C. hemionitidea* (Wall.) Presl. Tenasserim Distt.—Parish.
- C. pedunculata* (Hk. & Grev.) Ching. Stilwell Rd.—Young. First record for Burma.
- C. henryi* (Bak.) Ching. Stilwell Rd.—Young 67. First record for Burma.
- C. latiloba* Ching. Sin Lum Kaba—349. First record for Burma.
- C. flexiloba* (Christ) Ching var. *undulato-repanda* (C. Chr.) Ching. Sin Lum Kaba—407. First record from Burma.
- C. elliptica* (Thbg.) Ching. Tenasserim—Parish; Stilwell Rd.—Young 69.
- C. elliptica* var. *pothifolia* (Don) Ching. Ashe-myin Anauk-myin, Kawksawk State—8710; Sampu, Namkhok State—8295, 8324; Loimwe, Kengtung State—9144; Namkham 319.

55. *Leptochilus* Kaulf.  
(Ching 1933c)

- L. decurrens* Bl. Kengtung State—Rock 2137; Goteik Gorge—214; Thandaung—6790.
- L. lanceolatus* Fée. Burma—Beddome.
- L. axillaris* (Cav.) Kaulf. Tenasserim—Parish; Pegu—Clarke.

56. *Arthromeris* J. Smith  
(Ching 1933d)

- A. tenuicauda* (Hk.) Ching. Tibetan-Burmese border—Ching.
- A. wallichiana* (Spreng) Ching. Moulmein—Clarke; Sin Lum Kaba—Loije Rd. 42nd mile—350.
- A. wardii* (Cl.) Ching. Maikha-Salween—Forrest 25974.
- A. lehmanni* (Mett.) Ching. Dauna Taung—Parish; Upper Burma—Forrest 24922; Kalaw—9591; Taunggyi—180, 8104, 8787, 8698, 8699.
- A. lehmanni* var. *mairei* (Brause) Ching. Tiddim, Chin Hills—627. First record for Burma.
- A. lehmanni* var. *auriculata* Ching. Upper Burma—Forrest 24922.
- A. himalayense* (Hk.) Ching. Dauna Taung—Parish.

57. *Pseudodrynaria* C. Chr.

- P. coronans* (Wall.) C. Chr. S. E. of Moulmein—Parish; Toungoo—Parish; Tenasserim—Beddome; Yanka, Kengtung State—9222; Manhsum, Manglun State—9678; Mong Yang, Kengtung State; Stilwell Rd.—Young; between Muang Len and Muang Hpyak—Rock 2033.

58. *Drynaria* Bory

- D. propinqua* (Wall.) J. Sm. Kalaw—6A; Maymyo—420; Taunggyi—478; Pangwai, Kengtung State—7882, 9207; Mt. Popa—558; Kalemmyo—7230; Stilwell Rd.—Young.
- D. quercifolia* (L.) J. Sm. Moulmein—578; Rangoon (very common)—163, 168, 190; Wakema—7822; Bhamo—414; Kalewa—7190.

59. *Pyrrhosia* Mirbel  
(Ching 1935a)

= *Cyclophorus* Desv.

- C. mollis* (Kze.) Presl. Shan Hills—Collett; Thandaung—6745; Kalaw—625; Taunggyi—7845, 8113, 8657; Hopong—8262; Sin Lum Kaba—343; Haka, Chin Hills—7420.
- C. flocculosus* (Don) C. Chr. Between Sadon and Yunnan border—Rock 7462; Mogok—170; Mt. Popa—493, 503; Kalaw—L. P. Khanna.
- C. penangianus* (Hk.) Ching. Tenasserim—Parish.
- C. stigmoseus* (Sw.) Desv. Tenasserim—Beddome; Tavoy—Parish.
- C. beddomeanus* (Gies.) C. Chr. Wetwun, near Myamyo—62; Htam Sang Gaves, Hopong State—8100, 8261. First records for Burma.
- C. subfurfuraceus* (Hk.) C. Chr. Stilwell Rd.—Young. First record for Burma.
- C. pannosus* (Mett.) C. Chr. Tenasserim—Parish.
- C. nudus* (Gies.) C. Chr. Between Bhamo and Tengyueh—Rock 7825.
- C. heteractis* (Mett.) C. Chr. Between Sadon and Yunnan border—Rock 7491; Sin Lum Kaba—329, 356, 373, 397; Thandaung—65, 6713, 6781.
- C. lanceolatus* (L.) Alston. Mergui—Parish; Rangoon—164; Mt. Popa—557; Maymyo—417; Namkham—298; Stilwell Rd.—Young 18.
- C. spissus* (Bory) Desv. Tavoy—7989; Rangoon—6560, 8033, 8050; Syriam—464; Moulmeingyun—6921; Maubin Distt.—8056.
- C. confluens* (R. Br.) C. Chr. Tenasserim—Parish; Kyain, Amherst Distt.—6872.
- C. nummulariaefolius* (Sw.) C. Chr. Tavoy—Parish; Taung Thonta, Tavoy—8016; Namkhok State—fairly common.
- C. angustatus* (Sw.) Desv. Madremacan, Mergui—Parish.

60. *Drymoglossum* Presl

- D. piloselloides* (L.) Presl. Tavoy and Mergui—Parish; Kyaukme Taung, Tavoy—8008; Rangoon—106, 6699.

LOXOGRAMMACEAE Ching  
(Ching 1940b)

61. *Loxogramme* Presl

- L. lanceolata* (Bl.) Presl. Stilwell Rd.—Young. First record for Burma.
- L. chinensis* Ching. N'Bapa, Burma-Yunnan border—290. First record for Burma.
- L. involuta* (Don) Presl. Namkham—249; Mogok—264; Sin Lum Kaba—336.
- L. avenia* (Bl.) Presl. Mongnai, S. S. S.—7854. First record for Burma.

ANTROPHYACEAE Ching  
(Ching 1940b)

62. *Antrophyum* Kaulf.

- A. coriaceum* (Don) Wall. Mergui—Clarke; Mogok—140.
- A. obovatum* Baker. Between Sadon and Yunnan border—Rock 7501.
- A. parvulum* Blume. Sin Lum Kaba—399. First record for Burma.
- A. rectulatum* (Forst.) Klf. Tenasserim Distt.—Parish; Stilwell Rd.—Young.

VITTARIACEAE Presl emend.  
(Ching 1940b)

63. *Vittaria* Smith  
(Ching 1931e)

- V. elongata* Sw. Moulmein—Parish 83, 513; Moulmeingyun—6912.
- V. merrillii* Christ. Stilwell Rd.—Young. First record for Burma.
- V. sikkimense* Kuhn. Kalama Taung—Parish; Moulmein—Clarke; Tenasserim—Beddome; Pang Yang, Manglun State—9762; between Sadon and Yunnan border—Rock 7419.
- V. caricina* Christ. Mergui—Wight; between Sadon and Yunnan border—Rock 7395.

- V. linearifolia* Ching. Upper Burma—G. Forrest 26550.  
*V. flexuosa* Fée. Thandaung—6746. First record for Burma.  
*V. scolopendrina* (Bory) Thwait. Rangoon, Cabin Island in Victoria Lake. First record for Burma.  
*V. amboinensis* Fée. Martaban—Beddome; Kalama Taung—Parish.  
*V. himalayensis* Ching. Sin Lum Kaba—355. First record for Burma.  
*V. doniana* Hieron. Between Sadon and Yunnan border—Rock 7423; Haka, Chin Hills—7368, 7557, 7580, 7696.  
*V. doniana* var. *angusta* Hieron. Between Sadon and Yunnan border—Rock 7398.

ELAPHOGLOSSACEAE Ching  
 (Ching 1940b)

64. **Elaphoglossum** Schott

- E. petiolatum* (Sw.) Urban. N'Bapa, Burma-Yunnan border—393. First record for Burma.

HYMENOPHYLLACEAE  
 (Copeland 1933, 1937, 1938)

65. **Cephalomanes** Presl

- C. javanica* (Bl.) van den Bosch. Madremacan, Mergui—Parish; Zinyaik, Martaban—Maymyo Herb. 13429; Kyain, Amherst Distt.—6868.

66. **Crepidomanes** Presl

- C. bipunctatum* (Poiret) Copel. Moulmein—Parish.  
*C. latealatum* (v. d. B.) Copel. Haka, Chin Hills—7559. First record for Burma.  
*C. latemarginale* (Eaton) Copel. Moulmein—Parish.  
*C. plicatum* (v. d. B.) Copel. Burma—Beddome.

67. **Hymenophyllum** Smith

- H. barbatum* (v. d. B.) Baker. Between Sadon and Yunnan border—Rock 7442; Stilwell Rd.—Young.

68. **Mecodium** Presl

- M. australe* (Willd.) Copel. Tenasserim—Parish; between Sadon and Yunnan border—Rock 7445.  
*M. exsertum* (Wall.) Copel. Tenasserim—Parish; Thandaung—11, 6761.  
*M. polyanthos* (Sw.) Copel. Tenasserim—Parish; between Sadon and Yunnan border—Rock 7396.

69. **Meringium** Presl

- M. denticulatum* (Sw.) Copel. Moulmein Mts.—Parish; Stilwell Rd.—Young.

70. **Microgonium** Presl

- M. henzaianum* (Parish) Copel. Henzai Basin—Parish; Moulmein and Pegu—Parish.  
*M. motleyi* (v. d. B.) Copel. Tenasserim—Beddome.  
*M. parvifolium* (Bak.) Copel. Taungkya Tsakan, between Kaukareek and Myawadi—Parish.

71. **Vandenboschia** Copeland

- V. auriculata* (Bl.) Copel. Mergui—Maymyo Herb. 13432, Stilwell Rd.—Young 73, 88; Nam Tamai Valley, Burma-Tibet frontier—Ward 9151.  
*V. gigantea* (Bory) Dickason. Stilwell Rd., Burma border—Young. First record for Burma.  
*V. pyxidifera* (L.) Copel. Tenasserim—Parish.  
*V. radicans* (Sw.) Copel. Mooleyit, Tavoy—Beddome; Sin Lum Kaba-Loiji Rd., 35th Mile—284.

DICKSONIACEAE

72. **Cibotium** Kaulfuss

- C. barometz* (L.) J. Sm. Near Mt. Nwalabo, Tavoy—Parish; Madremacan, Mergui—Parish;

Namkham—37; Mogok—150; Loiye ford; Kengtung—9153; Pangyang, Manglun State—9793; Mongyai, N. S. S.—9628. One of the commonest ferns in Nanglum and Kentung States.

DENNSTAEDTIACEAE Ching  
(Ching 1940b)

73. *Dennstaedtia* Bernhardt

*D. scabra* Wall. Namkham—251; Sin Lum Kaba—360, 392.

74. *Microlepia* Presl

*M. hookeriana* (Wall.) Presl. Stilwell Rd.—Young 201. First record for Burma.

*M. trapeziformis* (Roxb.) Kuhn. Kengtung State—Rock 2230; Thandaung—49; Stilwell Rd.—Young 150.

*M. trichocarpa* Ching ined. Sin Lum Kaba—337; Pangwai, Kengtung State—9416. First records for Burma.

*M. firma* Mett. Mogok—124, 130; Sin Lum Kaba—282; Haka, Chin Hills—7422. First records for Burma.

*M. hirta* (Kaulf.) Presl. Kengtung State—Rock 2088; Mogok—126, 127, 127A, 132; Sin Lum Kaba—346; Mt. Nwalabo, Tavoy—8223.

*M. rhomboidea* Presl. Stilwell Rd.—Young 201. First record for Burma.

*M. pyramidata* (Wall.) Lacaite. Stilwell Rd.—Young 75, 202, 203. First records for Burma.

*M. marginata* (Houtt.) C. Chr. var. *calvescens* (Hk.) C. Chr. Kengtung State—2180.

*M. platyphylla* (Don) J. Sm. Kengtung State—Rock 2232; Loimwe, Kengtung—509, 9113; Lamtok, Haka, Chin Hills—7680; Taungteik—7238.

*M. kurzii* (Cl.) Bedd. Kengtung State—Rock 2083; Mogok-Momeik Rd.—153.

LINDSAYACEAE Ching

75. *Lindsaya* Dryander

*L. cultrata* (Willd.) Sw. Madremacan, Mergui—Parish.

*L. malabaricum* (Bedd.) Bak. Oktada, Martaban Hills, Kalama Range—Rock 750; Stilwell Rd.—Young 204.

*L. orbiculata* (Lam.) Mett. Stilwell Rd.—Young. First record for Burma.

*L. lancea* (L.) Bedd. Rangoon (cultivated)—456.

76. *Schizoloma* Gaudichaud

*S. ensifolia* (Sw.) J. Sm. Moulmein—Parish; 575; Ka-lein-aun, Tavoy Distt.—8020; Kyaukme Taung, Tavoy Distt.—8007.

77. *Stenoloma* Fée

*S. chusanum* (L.) Ching. Kengtung State—Rock 2078; Loimwe, Kengtung State—9105; Pangyang, Manglun State—8074; Namkham—38, 221, 225, 263; Sin Lum Kaba—278, 279, 285; Thandaung—6721; Stilwell Rd.—Young 206.

DAVALLIACEAE Gaudichaud  
(Ching 1940b)

78. *Davallodes* Copeland

*D. membranulosum* (Wall.) Copel. Loimwe, Kengtung State—521. First record for Burma.

79. *Acrophorus* Presl

*A. stipillatus* (Wall.) Moore. Between Sadon and Yunnan border—Rock 7392; Haka, Chin Hills—7506.

80. *Leucostegia* Presl

*L. immersa* (Wall.) Presl. Tenasserim Distt.—Parish; Thandaung—57; Mt. Popa—564; Taunggyi—8683; Loimwe, Kengtung—518.

- L. faberiana* (C. Chr.) Ching. Between Sadon and Yunnan border—Rock 7418.  
*L. hymenophylla* (Parish) Bedd. Moulmein—Parish.  
*L. pulchra* (Don) J. Sm. Moulmein—Parish; Mt. Popa—539, 540.  
*L. dareiformis* (Hk.) Bedd. Dauna Taung—Parish; Moulmein—Clarke.

#### 81. *Humata* Cavanilles

- H. assamica* (Bedd.) C. Chr. Stilwell Rd.—Young 207. First record for Burma.  
*H. alpina* (Bl.) Moore. Mergui and southwards—Parish; road between Amherst and Tavoy—San Tun Yin.  
*H. griffithiana* (Hk.) C. Chr. Loije ford, Burma-Yunnan border—409; Loimwe, Kengtung State—9165; Stilwell Rd.—Young 65. First records for Burma.

#### 82. *Davallia* Smith

- D. pectinata* (Sm.) Desv. Mergui southwards—Parish.  
*D. bullata* Wall. Mergui—Parish; Mogok—142; Loimwe, Kengtung—522.  
*D. lorrainei* Hance. Kalaw (Pipe line)—26. First record for Burma.  
*D. denticulata* (Burm.) Mett. Mergui—Parish; Tavoy—8051; Rangoon, Bird Island—192; Syriam—461; 461A; Maubin Distt.—8057.  
*D. solida* (Forst.) Sw. Merwui—Parish.  
*D. solida* var. *fijiensis* Diels. Rangoon (cultivated)—460.  
*D. speciosa* Mett. Moulmein—Ind. Fil.

#### 83. *Nephrolepis* Schott

- N. acutifolia* (Desv.) Christ. Tavoy—Parish.  
*N. biserrata* (Sw.) Schott. Rangoon (cultivated)—158.  
*N. cordifolia* (L.) Presl. Moulmein—Parish; Kyaukme Taung, Tavoy—8027; Toungoo—544; Mt. Popa—504, 543; Syriam—463; Nattaung, Karenni—9437; Taunggyi—8122A; Pangwai, Kengtung—7879, 9127; Stilwell Rd.—Young; Nam Tamai, Upper Burma—Ward 9179.  
*N. duffii* Moore. Rangoon (cultivated)—156.  
*N. falcata* (Cav.) C. Chr. Martaban—Parish; Kyaukme Taung, Tavoy—8237.

### DIDYMOCHLAENACEAE Ching (Ching 1940b)

#### 84. *Didymochlaena* Desvaux

- D. truncatula* (Sw.) J. Sm. Ta-ok, in damp hollows—Parish.

### PLAGIOGYRIACEAE Bower

#### 85. *Plagiogyria* (Kunze) Metténius

- P. adnata* (Blume) Bedd. Nattoung—Beddome.

### MONACHOSORACEAE Ching (Ching 1940b)

#### 86. *Monachosorum* Kunze

- M. subdigitatum* (Bl.) Kuhn. Between Sadon and Yunnan border—Rock 7404.

### HYPOLEPIDACEAE Ching (Ching 1940b)

#### 87. *Hypolepis* Bernhardt

- H. punctata* (Thbg.) Mett. Kengtung State—Rock 2337; Loimwe—9114; Namkham—261.



SINOPTERIDACEAE Koidzuma  
(Ching 1940b)

TRIBE 1. CRYPTOGRAMMEAE

88. *Cryptogramma* R. Brown

*C. brunoniana* Wall. Adung Valley, 12,000 ft., Upper Burma—Ward 9919. First record for Burma.

TRIBE 2. CHEILANTHEAE

89. *Cheilanthes* Swartz

*C. fragilis* Hk. Moulmein (on limestone rocks)—Parish.

*C. mysurensis* Wall. Thandaung—6727; Manipur River below Falam—7552. First records from Burma.

*C. belangeri* (Bory) C. Chr. Moulmein—Parish; —568; Tavoy—7979; Rangoon—166, 469, 586; Twante—8045.

*C. tenuifolia* (Burm.) Sw. Tavoy—7987; Moulmein—569; Rangoon—586A; White Crow Lake, below Taunggyi—8183. First records from Burma.

*C. argentia* (Gmel.) Kunze. Mergui—Clarke; Zwakabin—Parish.

*C. farinosa* (Forsk.) Klf. sens lat. Zwakabin and Beloogewn (sea level)—Parish; Tavoy, 2500 ft.—8028; Mt. Popa—554, 555, 6603; Taunggyi—36, 621; Wetwun—634; Sin Lum Kaba—265; Taingteik, Chin Hills—7553, 7554; Falam—7567.

*C. farinosa* var. *chrysophylla* Hk. Mergui—Clarke; Zwakabin—Parish.

*C. farinosa* forma *dalhousiae*. Mt. Popa—6603A; Mogok—119; Maymyo Herb.—581.

*C. farinosa* var. nov. Goteik Gorge—215. First record for Burma.

*C. farinosa* var. nov. Thandaung—56. First record for Burma.

*C. rufa* Don. Mergui—Clarke; Zwakabin—Parish; Mt. Popa—6611; Taunggyi—36, 183.

*C.* sp. nov. (near *subrufa* Bak.). Manipur River below Falam, Chin Hills—7551. First record for Burma.

*C. duclouxii* (Christ) Ching. Kalaw—22; Taunggyi—182. First records for Burma.

90. *Doryopteris* J. Sm.

*D. ludens* (Wall.) J. Sm. Moulmein—Parish; Maymyo—105, Goteik Gorge—201; Mt. Popa—476, 6651; Webula, Chin Hills—7762.

TRIBE 3. ONYCHIEAE

91. *Onychium* Kaulfuss

*O. japonicum* (Thbg.) Kunze. Ava—Hope.

*O. lucidum* (Don) Spreng. Loimwe, Kengtung—9149; Sin Lum Kaba—275, 327, 378; Falam, Chin Hills—7240; Haka—7707. First records for Burma.

*O. siliculosum* (Desv.) C. Chr. Amherst—Clarke; Kyain, Amherst Distt.—6863; Toungoo—Maymyo Herb.; Pyinmana—7113; Mogok—Momeik Rd.—118; Myitkyina; Kengtung State—Rock 2073.

PTERIDACEAE Ching  
(Ching 1940b)

TRIBE 1. LONCHITIDEAE

92. *Pteridium* Gleditsch

*P. aquilinum* (L.) Kuhn. Mooleyit, foot of Mt. Nwalabo—Parish; Tenasserim—Hope; Mt. Victoria, Chin Hills—8596; Haka—7670; Mogok—134, 136; Kutkai—218; N'Bapa—262; Molahein Mt., Lawksawk State—8735; Loimwe, Kengtung—9147.

*P. aquilinum* var. *esculentum* Forst. Moulmein southward—Clarke; Maymyo—33; Taunggyi—472; 9006; Namkham—235; Mogok—134.

93. *Histiopteris* J. Smith

*H. incisa* (Thbg.) J. Sm. Kengtung Rd. at Salween River—9281. First record for Burma.

## TRIBE 2. PTERIDEAE

94. *Pteris* Linn.

- P. vittata* L. Common everywhere—Parish; Kyain, Amherst Distt.—6899; Pyinmana—7112; Kalaw—21; Taunggyi—35, 184, 9012, 9298; Takaw, Kengtung State—9292; Maymyo—424; Mogok—109; Momeik State—147; Kalemmyo—7209; Tiddim, Chin Hills—635.
- P. cretica* L. Amherst Distt.—Parish; Kalaw—5; Taunggyi—477; Loimwe, Kengtung—537; 9242; Maymyo—32; Sin Lum Kaba—372; Haka, Chin Hills—7546.
- P. cretica* var., or sp. nov. Sin Lum Kaba—353. First record for Burma.
- P. heteromorpha* Fée. Burma—Parish.
- P. dactylina* Hk. Tang-tung, Upper Burma-Vernay-Cutting Exped. 325 (Ward).
- P. ensiformis* Burm. Kengtung State—Rock 2031; Rangoon (cultivated)—556; Stilwell Rd.—Young.
- P. griffithii* Hk. Tamu, Upper Burma-Vernay-Cutting Exped. 10 (Ward).
- P. pellucida* Presl. Kengtung State—Rock 2246; Kyauktalon, Moulmein Distt.—6833; Stilwell Rd.—Young 42.
- P. nervosa* Wall. Amherst—Parish; Rangoon—636; Syriam—462; Pyinmana—7119; Mt. Popa—550, 551, 562; Sin Lum Kaba—348; Mogok-Momeik Rd.—111.
- P. esquirolii* Christ. Kengtung State—Rock 2188.
- P. semipinnata* L. Mergui, on the Tenasserim River—Parish; Stilwell Rd.—Young.
- P. decrescens* Christ. Goteik Gorge—206. First record for Burma.
- P. grevilleana* Wall. Stilwell Rd.—Young 59. First record for Burma.
- P. khasyana* (Cl.) Ching. Haka, Chin Hills—7311. First record for Burma.
- P. fauriei* Hieron. Pyinmana—7115; Taunggyi—473, 476; Namkham—N'Bapa—244; Mogok—114. First records for Burma.
- P. fauriei* var. *rigida* Hieron. Mogok—113; Kalemmyo-Webula—7210; Haka—7571. First records for Burma.
- P. argyrea* Moore. Tenasserim Distt.—Parish; Kyaukme Taung, Tavoy—8235; Sin Lum Kaba—268; Mogok—101.
- P. aspericaulis* Wall. Zwakabin, Moulmein—7015; Bantai, Kengtung—9251; Stilwell Rd.—Young; Adung Valley, Upper Burma—Cutting Sikkim Exped. 9248 (Ward). First records for Burma.
- P. excelsa* Gaud. Burma—Parish.
- P. longipinnula* Wall. Burma—Ind. Fil.
- P. longipinnula* var. *hirtula* C. Chr. Valley of the Meh Len, Kengtung—Rock 2133 (type).
- P. baurita* L. Moulmein and elsewhere in Tenasserim Distt.—Parish; Nwalabo, Tavoy—8211, 8019; Taungwine, Moulmein—6845; Kyauktalon, Moulmein—6838; Pyinmana—7124; Thandaung—61; Namkham—24, 227; N'Bapa—271; Mogok—637; Loimwe, Kengtung—524, 529.
- P. linearis* Poir. Kalaw—24A; Loimwe, Kengtung—9108. First records for Burma.
- P. longipes* Don. Tenasserim Distt.—Parish; Pegu—Clarke; Kengtung State—Rock 2179; Sin Lum Kaba—328; Mogok—121; Haka, Chin Hills—7272.
- P. wallichiana* Ag. Sin Lum Kaba—331. First record for Burma.
- P. wallichiana* var. *austro-siniea* Ching. Loimwe, Kengtung—9112. First record for Burma.

ADIANTACEAE Presl  
(Ching 1940b)95. *Adiantum* Linn.

- A. parishii* Hk. On top of limestone rock called Zwakabin, Moulmein—Parish; —7041.
- A. philippense* L. Everywhere on the plains—Parish; Kyaukme Taung, Tavoy—8026, 7992; Moulmein—574; Rangoon—10, 160, 470; Thandaung—48; Mt. Popa—549; Taunggyi—475.
- A. soboliferum* Wall. Anisakan Gorge, Maymyo—429. First record for Burma.

- A. edgeworthii* Hk. Fort Stedman, Inle Lake, S. S. S.—Hope; Taunggyi—474; Kalaw—25; Loimwe, Kengtung—510; N'Bapa—309; Sin Lum Kaba—306; Taungteik, Chin Hills—7246, 7565A.
- A. caudatum* L. Kungtung State—Rock 2329; Kengtung—9191; Taunggyi—9014, 9387; Mt. Popa—552, 553, 6607; Wetwun—63; Goteik Gorge—203; Mogok—146; Taungteik, Chin Hills—7241, 7246, 7565.
- A. capillus-veneris* L. Anisakan Gorge—416; Goteik Gorge—213; Kutkai—216; Kalemyo-Webula—7760; Yetagone, Chin Hills—7335; Taungteik, Chin Hills—7241; Ruavan, Haka, Chin Hills—7666.
- A. cuneatum* Langsd. & Fisch. Namkham (cultivated)—220.
- A. flabellulatum* L. Mong Yang, Kengtung State—9795; Namhka River, Manglun State—9794. First records for Burma.
- A. trapeziforme* L. Rangoon (cultivated)—157.

GYMNOGRAMMACEAE Ching  
(Ching 1940b)

TRIBE 1. GYMNOGRAMMEAE

96. *Taenitis* Willd.

- T. blechnoides* (Willd.) Sw. Amherst—Parish; Moulmein—Parish; Tenasserim—Beddome.

TRIBE 2. GYMNOPTERIDEAE

97. *Congiogramme* Fée

- C. fraxinea* (Don) Diels. Tenasserim—Parish; Chin Hills—Dickason.  
*C. petelotii* Tardieu-Blot. Taunggyi—9382; Sin Lum Kaba—344. First records from Burma.

98. *Pityrogramma* Link

- P. calomelanos* (L.) Link. Tavoy—7976; Kyain, Amherst Distt.—6873; Rangoon—189, 585. First records for Burma.

99. *Hemionitis* Linn.

- H. arifolia* (Burm.) Moore. Tenasserim Distt.—Parish; Rangoon—159, 6572; Insein—8157.

ACROSTICHACEAE Presl emend.  
(Ching 1940b)

100. *Acrostichum* Linn.

- A. aureum* L. Amherst—Parish; Rangoon (cultivated)—37.

CERATOPTERIDACEAE C. Chr.  
(Ching 1940b)

101. *Ceratopteris* Brongniart

- C. thalictroides* (L.) Brongn. Moulmein—Parish; Kyaikto—6828; Rangoon—126; Myaungmya—6930.

MARSILEACEAE

102. *Marsilea* Linn.

- M. brachycarpa* A. Br. Pegu—Ind. Fil.; Pinyinana—542.

SALVINIACEAE

103. *Salvinia* (Micheli) Guettard

- S. cucullata* Roxb. Bhamo—4081. First record for Burma.

104. *Azolla* Lamarck

- A. pinnata* R. Br. Rangoon—Dickason. First record for Burma.

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