

Studies on Pacific Ferns, Part III

The Lindsaeoid Ferns

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THE PRESENT STUDY arose from the fact that the genus *Lindsaea* has proved of particular interest from a cyto-taxonomic viewpoint, and, as the author hopes to deal with some of these ferns in the Pacific islands from that aspect, he took the opportunity of a period spent at the Herbarium of the Royal Botanic Gardens, Kew, to examine the collections located there. It quickly became evident that the species of lindsaeoid ferns, particularly those of New Caledonia, were poorly understood. There was not sufficient time and, in some cases, not sufficient material to completely clear up all doubtful aspects, but it is hoped that the present paper will go some distance towards clarifying the situation. To accomplish the task fully for the Pacific and neighbouring regions would require a work almost as large as the excellent revision of *Lindsaea* in the New World by Kramer (*Acta Bot. Neerlandica* 6, 97–290, 1957).

Taxonomically, the lindsaeoid ferns have proved a difficult group almost everywhere, and this is especially apparent in New Caledonia where both specific and generic distinctions are extremely doubtful. It is possible that they are a very old group whose close relationships are more apparent than real. This possibility has already been indicated by the limited cytological work published to date.

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Lindsaea dimorpha Bailey.

Lindsaea dimorpha Bailey. Handbook, Queensland Ferns 19, 1874.

L. anogrammoides C. Chr. Viert. Nat. Ges. Zurich 70, 223, 1925.

Christensen himself suggested that these two were closely related, and comparison of his type with Australian material shows that there is nothing to distinguish the New Caledonian specimen. It should consequently be recognized as *L. dimorpha*.

SPECIMENS EXAMINED: Franc 1308 in Herb. C. Chr. (Christensen's type; B. M.), Bailey unnumbered (Kew).

Lindsaea lapeyrousii (Hk.) Bak.

Davallia lapeyrousii Hk. 2nd. Cent. f. 56, 1861.

Lindsaea lapeyrousii (Hk.) Bak. Syn. Fil. 106, 1874.

L. kajewskii Copel. Journ. Arnold Arb. 12, 48, 1931.

In describing *L. kajewskii*, Copeland suggested that it was possibly related to *L. lapeyrousii*, but he apparently did not see Hooker's type specimen. Almost all recent collections of *L. lapeyrousii* have come from Fiji, where it is not uncommon, whereas Kajewski's specimen was obtained from Vanikoro Island in the Santa Cruz group. Hooker's type has, however, the locality given as "Vanicolla Island," which appears to be nothing more than an older rendering of Vanikoro, so that both specimens originated from the same island. The lack of subsequent material can be due only to the infrequency of collecting there. Copeland's paper gives the collection number as Kajewski 523, whereas a Kajewski specimen from Vanikoro at Kew inscribed "*Lindsaea kajewskii* n. sp." is numbered 533. The director of the Arnold Arboretum has

kindly informed me that the specimen there, used by Copeland, is also 533, so that the number quoted in the published description is obviously an error.

SPECIMENS EXAMINED: From Vanikoro—Herb. Hk. without collector (Kew), Kajewski 533 (Kew).

Lindsaea nervosa Mett.

Lindsaea nervosa Mett. Ann. Sc. Nat. IV, 15, 62, 1861.

A comparison of New Caledonian material collected by Vieillard showed a discrepancy for a particular collection number. Mettenius gave the type specimen of his *L. nervosa* as Vieillard 1540, locality Mons Dore, which is presumably Mont Dore, whereas sheets at both Kew and the British Museum (Natural History) bearing that number were specimens of *Schizoloma prolongata*, collected at Wagap. The Mettenius type obtained from Paris proved to be exactly what other collectors had understood as *Lindsaea nervosa*, and did indeed have the number and locality given in the published description. It appears that two widely separated collections have received the same number. Accidents such as this have contributed in some measure to the confusion surrounding many species from New Caledonia.

Schizoloma prolongata (Fourn.) Brownlie, comb. nov.

Lindsaea prolongata Fourn. Ann. Sc. Nat. V, 18, 334, 1873.

L. cheiroides Fourn. Ann. Sc. Nat. V, 18, 334, 1873.

Comparison of the collections at Kew and the British Museum with one of Fournier's type specimens of *L. cheiroides* (Balansa, 1602) leads to the conclusion that these are all better regarded as examples of one variable species. The name *L. cheiroides* has been applied to a form with a markedly elongated apical portion of the frond and with the lobing of the sterile pinnules accentuated to serrations. *L. prolongata* as understood by Fournier and others has pinnules with rounded lobes, and the terminal division of the frond is not elongated. However, varia-

tion from rounding to serration of the pinnules may be observed even within a single specimen, and since the other characters appear to be identical there are no grounds for retaining them as separate species. It appears possible that these may also grade into *Schizoloma heterophyllum* var. *majus* (Christensen, Viert. Nat. Ges. Zurich 77, 8, 1932). On the basis of Holttum's understanding of the lindsaeoid genera (Flora of Malaya 2, 320, 1954), it should be placed in the genus *Schizoloma*.

SPECIMENS EXAMINED: MacGillivray 27 (B.M.), unnumbered (Kew), Herb. Macleay unnumbered (Kew), Vieillard 1540 (Kew and B.M.), Balansa 1602 (Paris), le Rat 943 and 965 (Kew), Franc 11 and 33 (B.M.) and 365 and 679 (Kew), Pancher unnumbered (B.M.), Compton 541 (B.M.), Buccholz 1260 (Kew).

Tapeinidium flavicans (Mett. ex Fourn.) Hier. Hedwigia 62, 13, 1920.

Lindsaea flavicans Mett. Mem. Soc. Sc. Nat. Cherb. 10, 317, 1867 (nomen); Fourn. Ann. Sc. Nat. V, 18, 334, 1873.

L. tenuifolia Mett. Ann. Sc. Nat. IV, 15, 64, 1861 (non Bl.).

L. balansae Fourn. Ann. Sc. Nat. V, 18, 335, 1873.

L. campylophylla Fourn. Ann. Sc. Nat. V, 18, 335, 1873.

Davallia lenormandi Bak. Syn. Fil. 471, 1874.

Odontosoria lenormandi (Bak.) C. Chr. Ind. Fil. 465, 1906.

This is another example of several graded forms having been described under different names. Baker's *Davallia lenormandi* is represented at Kew by Vieillard 1548 and 1549 and by Pancher unnumbered. These specimens show considerable variation in degree of fineness and dissection of the fronds, but all are recognized as the one species. A single sheet, MacGillivray 14, which is given by Fournier as an example of *Lindsaea flavicans*, is identical with the most dissected form of Baker's species. Balansa 1652, the type of *L. balansae*, is another very dissected form with somewhat more open habit but is otherwise indistinguishable. This possibility had already been suggested by Christensen (Viert.

Nat. Ges. Zurich 74, 60, 1929). Similarly Balansa 854, the type specimen of *L. campylophylla*, differs only in the slightly longer tertiary and quaternary segments. All should be united under the one species *Tapeinidium flavicans*. It seems possible that the related species *T. moorei* (Hk.) Hier. may even represent a decidedly coarse form of the same species, but enough comparative material was not available to decide this with certainty.

Christensen identified *Lindsaea tenuifolia* of Mettenius with *Sphenomeris chusana* (L.) Copel., which does occur in New Caledonia, but Vieillard 1548 and 1549, which Mettenius gives as his species, represent Baker's *Davallia lenormandi*. Since that has been reduced to *Tapeinidium flavicans*, *Lindsaea tenuifolia* Mett. must also be a synonym of that species.

SPECIMENS EXAMINED: MacGillivray 14 (B.M.), unnumbered (Kew), Vieillard 1548 and 1549 (Kew), Pancher unnumbered (Kew), Balansa 854 and 1652 (Paris), Schlechter 15046 (Kew and B.M.).

Sphenomeris chusana (L.) Copel.

Lindsaea retusa Mett. Ann. Sc. Nat. IV, 15, 63, 1861.

This appears to have been an incorrect identification, because the plant is not the same as *L. retusa* of Indonesia. Mettenius gives his specimen as Vieillard 1547, but an examination of the sheet used by him shows this to be a large example of the widespread *Sphenomeris chusana* which has been collected frequently in New Caledonia.

SPECIMEN EXAMINED: Vieillard 1547 (Paris).

SUMMARY

Five species of the genus *Lindsaea* from New Caledonia and one from Vanikoro Island are reduced to synonyms either of other species of *Lindsaea* or of species of related lindsaeoid ferns. One species has also been transferred from *Lindsaea* to *Schizoloma*. A number of confusing aspects of collections of *Lindsaea* from New Caledonia have been clarified.

Further collections from New Caledonia appear to be necessary to elucidate the relationships among the three species *L. macgillivrayi* Carr., *L. nervosa* Mett., and *L. neocaledonica* Compton, and to define the specific limits within the genus *Schizoloma*.