

wings are umber brown above, the hinder pair bluish white in the posterior third.

All three insects are Indian as well as Malayan, and one, if not the others, occurs in China.

I. H. BURKILL.

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## FRAGMENTS OF MALAYAN GEOGRAPHIC BOTANY.

### No. I. Enumeration of Pahang plants collected by the late A. M. Burn Murdoch.

On a journey of inspection down the Pahang river in June, 1913, the late Mr. A. M. Burn Murdoch, took with him a collector from the Botanic Gardens, Singapore, and obtained the species here enumerated.

The collecting began near Temerloh, which is 75 miles in a straight line from the coast, and was continued down the tortuous course of the river to its mouth, whence again northwards, it was carried up the coast to Balok.

Nos. 151-179 came from Temerloh and its neighbourhood. Nos. 180-192 came from places on the first 60 miles of this river's course below Temerloh. Nos. 193-200, and 301-311 came from the neighbourhood of the Chenik river where is a forest reserve. Nos. 312-332 were collected below the Chenik river, chiefly about Kwala Pahang. Near Kuantan, Balok and Beserah were collected Nos. 201-224 and Nos. 333-350.

There is a paper by Mr. H. N. Ridley on the flora of this part of the Peninsula in the Transactions of the Linnean Society of London, 2nd Series, Botany, iii., pp. 267-408, enumerating very many more plants than are here recorded; but nevertheless Mr. Burn Murdoch's bundles add much information towards a knowledge of the distribution of plants in the Peninsula.

There is a further brief notice of the flora of the lower part of the Pahang river in the Journal of the Straits Branch of the Royal Asiatic Society, part 25 (1894) pp. 33-37.

Mr. Ridley has kindly described the novelties of the collection in the Journal of the Straits Branch of the Royal Asiatic Society, No. 68 (1915), pp. 12-14.

Here after each name an indication is given of the dispersal which that plant has in the Peninsula: and unfortunately the scantiness of our knowledge of the flora of the Eastern side is made evident in it.



*Unona longiflora*, Roxb. Chenik, No. 197.

Distr: A northern plant extending southwards, at any rate all down the west side, to Singapore, now first obtained on the east side.

*Polyalthia Teysmanni*, King. Temerloh, No. 154.

Distr: Selangor and Pahang, southwards.

*Nymphaea stellata*, Willd. Semantan road, No. 156: Tasek Chenik, No. 308.

Distr: Here and there in the Peninsula; but hardly recorded from the southern parts.

*Crataeva macrocarpa*, Kurz. Tasek Chenik, No. 302.

Distr: From the north to Malacca on the west coast and in Pahang.

*Pittosporum ferrugineum*, Ait. Kwala Pahang, No. 326.

Distr: Probably throughout the Peninsula, though at present unknown from the east coast except at Kwala Pahang.

*Xanthophyllum glaucum*, Wall. Tasek Chenik, No. 307.

Distr: From the north to Perak and Pahang.

*Sida cordifolia*, Linn. Kwala Pahang, No. 332.

Distr: In places chiefly near the coast as a weed.

*Elaeocarpus paniculata*, Wall. Temerloh, No. 162.

Distr: Apparently throughout the Peninsula.

*Elaeocarpus stipularis*, Blume. Pahang river between Lubok Paku and Binking, No. 189.

Distr: Apparently throughout the Peninsula.

*Hiptage madhoblota*, Gaertn. Kuantan, No. 219.

Distr: From the north southwards to Kuala Lumpur and the Pahang river.

*Aglaia cordata*, Hiern. Kwala Bera, below Temerloh, No. 173.

Distr: From Perak to Singapore on the west side; from the east now for the first time collected.

*Chailletia setosa*, King. Balok, No. 214.

Distr: Perak to Malacca, and on the Pahang river.

*Cansjera Rheedei*, Gmel., var. Tanjong Tembeling near Kuantan, No. 222.

Distr: Mangrove swamps round the coast.

*Euonymus javanicus*, Blume. Kwala Pahang, No. 320.

Distr: Apparently general in the Peninsula.

*Trigonachras acuta*, Radlk. Kuantan, No. 37.

Distr: Singapore, Pahang and Malacca.

*Allophyllus Cobbe*, Blume. Chenik reserve, No. 301.

Distr: A very common plant in the Peninsula.



- Jagera speciosa*, Blume. Chenik, No. 199.  
Distr: Selangor and Pahang.
- Dodonaea viscosa*, Jacq. Kwala Pahang, No. 328.  
Distr: Around the Peninsula at rather widely spaced places.
- Desmodium polycarpum*, D.C. Kuantan, No. 335; also var., *ovatifolium*, Wall. Kuantan, No. 334.  
Distr: Common throughout the Peninsula.
- Desmodium umbellatum*, D.C. Basrah, No. 202.  
Distr: All round the coasts of the Peninsula.
- Uraria crinita*, Desv. Binking, No. 192.  
Distr: Very general in the Peninsula.
- Pueraria phaseoloides*, Benth. Pulau Rusa, No. 315.  
Distr: From the north, southwards to Negri Sembilan.
- Canavalia lineata*, D.C. Karang river at Basrah, No. 217.  
Distr: Around the coasts.
- Canavalia obtusifolia*, D.C. Semantan road, No. 159.  
Distr: Around the coasts and up the Pahang river.
- Dunbaria Scortechinii*, Prain. Pulau Rusa, No. 314.  
Distr: Southern Siam to Perak, and the Pahang river.
- Flemingia congesta*, Roxb. Pulau Rusa, No. 316.  
Distr: From the north to Malacca and the Pahang river.
- Derris sinuata*, Thwaites. Kwala Pahang, No. 331.  
Distr: Around the coasts of the Peninsula.
- Cassia nodosa*, Ham. Temerloh, No. 153.  
Distr: From the north to Malacca and the Pahang river.
- Cassia siamea*, Lamk. Kwala Bera, below Temerloh, No. 180.  
Distr: From the north to Malacca and the Pahang river.
- Cassia mimosoides*, Linn. Tasek Chenik, No. 312.  
Distr: Throughout the Peninsula.
- Bauhinia integrifolia*, Roxb. Lubok Paku, No. 182.  
Distr: Throughout the Peninsula.
- Saraca triandra*, Baker. Foot of Bukit Basrah, without number.  
Distr: From the north, southwards to Malacca and the Pahang river.
- Acacia pennata*, Willd. Binking, No. 191.  
Distr: From the north to Malacca and the Pahang river.
- Parinarium nitidum*, Hook. f. Kwala Pahang, No. 325.  
Distr: Setul to Malacca, in Singapore and on the Pahang river.
- Carallia lucida*, Roxb. Pahang river between Lubok Paku and Binking, No. 188.  
Distr: All down the west side of the Peninsula, and now first collected on the east side.



- Combretum stenopetalum*, Heurck and Muell. Arg. Pahang river between Lubok Paku and Binking, No. 190.  
Distr: Probably an addition to the known flora of the Peninsula.
- Barringtonia spicata*, Blume. Chenik, No. 195.  
Distr: Trang to Malacca on the west side, Pahang on the east side.
- Barringtonia fusiformis*, King. Chenik, No. 198.  
Distr: Perak and Selangor on the west side, Pahang on the east side.
- Pternandra coerulescens*, Jack. Chenik, No. 196.  
Distr: General through the Peninsula.
- Memecylon dichotomum*, C. B. Clarke. Temerloh, No. 164.  
Distr: Kedah to Malacca on the west side, on the east side along the Pahang river, whence it has been brought twice before.
- Sarcocephalus subditus*, Miq. Pahang river between Lubok Paku and Binking, No. 185.  
Distr: From Perak, southwards to Singapore, and on the Pahang river.
- Sarcocephalus Junghuhnii*, Miq. Kuantan, on Bukit Galing, No. 340.  
Distr: Known hitherto from the western side of the Peninsula and from Singapore, but its wide distribution outside made probable its occurrence on the eastern side.
- Mussaenda mutabilis*, Hemsl. Vern.—Balik Adap as in Sungei Ujong. Temerloh, No. 170.  
Distr: Known to occur all down the east of the Peninsula and in Pahang.
- Gardenia carinata*, Wall. Vern.—Laca Hutan. Temerloh, No. 169.  
Distr: Penang and Perak to Malacca; now also obtained in central Pahang; recorded as obtained by Murton in Singapore (? cultivated only).
- Gardenia tubifera*, Wall. Bukit Berhala, Tasek Chenik, No. 304.  
Distr: General throughout the Peninsula.
- Gardenia tentaculata*, Hook. f. Tasek Chenik, No. 311.  
Distr: Apparently general throughout the Peninsula from Penang, Province Wellesley, and Tringganu southwards. It has been obtained before twice on the Pahang river.
- Diplospora velutina*, King and Gamble. Bukit Galing, Kuantan, No. 344.  
Distr: Hitherto recorded for Perak only.
- Canthium didymum*, Roxb. Pulau Lantai, No. 306.  
Distr: General throughout the Peninsula.
- Canthium parvifolium*, Roxb. Bukit Ubi, Kuantan, No. 349.  
Distr: General throughout the Peninsula.



- Ixora stricta*, Roxb. Temerloh, No. 158; Kwala Pahang No. 319.  
Distr: General throughout the Peninsula.
- Ixora humilis*, King and Gamble. Balok, on Bukit Kapis, No. 215.  
Distr: Penang, Temerloh, Perak and Selangor, and on the east coast in Pahang.
- Ixora* cf. *concinna*, R. Br. Chenik reserve, No. 200.  
Distr: *I. concinna* occurs generally through the Peninsula.
- Pavetta humilis*, Hook., f. Balok, on Bukit Kapis at 300 ft., No. 211.  
Distr: From the west coast at Malacca to the east coast at Balok.
- Prismatomeris albidiflora*, Thwaites. Temerloh, No. 179.  
Distr: General throughout the Peninsula.
- Vernonia arborea*, Buch.-Ham. Bukit Galing at Kuantan, No. 339.  
Distr: General along the west side of the Peninsula, and probably also along the east side; but so far only collected on the Pahang river and at Kuantan.
- Plumbago zeylanica*, Linn. Semantan road, No. 157.  
Distr: In most parts of Peninsula apparently.
- Ardisia crenata*, Roth. Balok, No. 209; Kwala Pahang, No. 330.  
Distr: General throughout the Peninsula.
- Ardisia littoralis*, Andr. Kwala Pahang, No. 329.  
Distr: General around the Peninsula; but not necessarily on the coast.
- Sideroxylon ferrugineum*, Hook. and Arn. Kwala Pahang, No. 317.  
Distr: All down the western side of the Peninsula; on the eastern side only known from the mouth of the Pahang river and Pulau Tioman.
- Symplocos Curtisii*, Oliv. Balok, on Bukit Kapis, No. 216.  
Distr: Occurs in Penang, Perak, Selangor, Negri Sembilan and Pahang.
- Symplocos spicata*, Roxb. Pulau Lantai, No. 305.  
Distr: From the north to Malacca and in Pahang.
- Jasminum bifarium*, Wall. Pahang river between Lubok Paku and Binking, No. 184.  
Distr: All down the west side of the Peninsula, and general apparently in Pahang (and probably down the east side).
- Ervatamia malaccensis*, King and Gamble. Temerloh, with out number.  
Distr: All down the west side of the Peninsula; now first collected on the eastern side.
- Parsonsia spiralis*, Wall. Balok, No. 205.  
Distr: Down the west coast of the Peninsula; now first collected on the eastern side.



*Aganosma marginata*, G. Don. Pahang river between Lubok Paku and Binking, No. 187.

Distr: Apparently in all parts of the Peninsula.

*Tylophora* sp., very near to *T. asthmatica*, W. & A. Kwala Pahang, No. 327.

Distr: This species of *Tylophora* occurs from Tringganu to Kwala Pahang.

*Hoya latifolia*, G. Don. Chenik, No. 194.

Distr: Pahang, Johore and Singapore.

*Fagraea fragrans*, Roxb. Pulau Berhala, No. 303.

Distr: In several parts of the Peninsula, chiefly near the coast (vide Burn Murdoch, Trees and timbers of the Malay Peninsula, ii., 1912, p. 3).

*Norrisia malaccensis*, Gardn. Bukit Galing at Kuantan, No. 348.

Distr: In Perak and Malacca; and now also known from Pahang.

*Ipomoea pes-caprae*, Roth. Karang river at Basrah, No. 218.

Distr: Probably all round the coasts.

*Ipomoea littoralis*, Boiss. Tanjong Tembeling near Kuantan, No. 221.

Distr: On the coast near Malacca and near Kwala Pahang.

*Merremia hastata*, Hallier f. Balok, No. 207.

Distr: General through the Peninsula.

*Cordia premnifolia*, Ridl., in Journal R. Asiatic Society, Straits Branch, No. 68, p. 12. Pahang river between Lubok Paku and Binking, No. 186.

Distr: An addition to the Malay Flora, known from Kwala Lipis and the Pahang river.

*Didymocarpus crinita*, Jack. Temerloh, No. 165.

Distr: Through the Peninsula.

*Justicia ptychostoma*, Nees. Temerloh, No. 167 and 168.

Distr: From the north southwards to Negri Sembilan and Pahang.

*Justicia remotiflora*, Ridl., in Journal R. Asiatic Society, Straits Branch, No. 68, p. 12. Temerloh, No. 175.

Distr: An addition to the known Malay Flora.

*Vitex trifolia*, Linn. Kwala Pahang, No. 313.

Distr: On the coast at Penang, Malacca, Singapore and Pahang.

*Clerodendron neriifolium*, Wall. Tanjong Api at Kuantan, No. 220.

Distr: On the coast round the Peninsula.

*Nepenthes ampullaria*, Jack. Kuantan, No. 338.

Distr: Throughout the Peninsula, south of Penang and Perak.

*Alseodaphne peduncularis*, Hook. f. Temerloh, No. 166.

Distr: From Penang and Perak to Negri Sembilan on the west side; now also in Pahang.



- Litsea johorensis*, Gamble. West of Temerloh, No. 171.  
Distr: Johore, and now also known from Pahang.
- Litsea amara*, Blume. Temerloh, No. 161.  
Distr: General throughout the Peninsula.
- Neolitsea zeylanica*, Merrill. Kwala Pahang, No. 321.  
Distr: Down the east side to Singapore; but from the west side only as yet collected in Pahang.
- Loranthus grandifrons*, King. Temerloh, No. 151.  
Distr: Down the east side to Malacca, and in Pahang.
- Henslowia varians*, Blume. Kwala Pahang, No. 318.  
Distr: Throughout the Peninsula.
- Glochidion littorale*, Blume. Sungei Balok, No. 204.  
Distr: Down the east coast to Singapore and in Pahang.
- Glochidion laevigatum*, Hook. f. Sungei Balok, No. 206.  
Distr: Penang to Singapore, and in Pahang.
- Ostodes macrophylla*, Benth. & Hook. f., var. Semantan road station, No. 160.  
Distr: Perak, Malacca, Singapore and Pahang.
- Mallotus* sp. Very like some Philippine specimeus of *M. ricinoides*, Muell. Arg. Male flowers only. Basrah, No. 201.
- Thismia racemosa*, Ridl., in Journal R. Asiatic Society, Straits Branch, No. 68, p. 13. Six miles south east of Temerloh, No. 178.  
An addition to the known Malay Flora.
- Thrixspermum Calceolus*, Reichb. f. Tanjong Tembeling at Kuantan, without number.  
Distr: From Penang to Singapore, and in Pahang.
- Renanthera alba*, Ridl. Balok, No. 208.  
Distr: Singapore and Pahang.
- Tropidia squamata*, Blume. Bukit Galing near Kuantan, No. 345.  
Distr: From Kedah to Singapore on the west side; in Pahang on the east side.
- Gastrochilus plicatus*, Ridl. Balok, Bukit Kapis, No. 212.  
Distr: Known from the central range in Perak, from Kuantan, and now from the Pahang coast.
- Gastrochilus biloba*, Ridl. Balok, Bukit Kapis, No. 210.  
Distr: Known from the central range in Perak, Pahang and Selangor; and now from the Pahang coast.
- Amomum ochreum*, Ridl. Bukit Galing at Kuantan, No. 347.  
Distr: Selangor and Pahang.
- Amomum uliginosum*, Koen. Bukit Galing at Kuantan, No. 342.  
Distr: From Penang and Perak to Johore, and in Pahang.



*Hornstedtia megacheilos*, Griff. Bukit Galing at Kuantan, No. 341.

Distr: From Penang and Perak to Singapore, on the west side; also in Pahang.

*Donax arundinastrum*, Lam.; (*Clinogyne grandis*, Benth.), Kwala Bera, below Temerloh, No. 181.

Distr: Throughout the Peninsula.

*Xyris anceps*, Lam. Kuantan, No. 333.

Distr: In most parts of the Peninsula.

*Iguanura geonomaeformis*, Mart. Kwala Bera, below Temerloh, No. 174.

Distr: From Perak to Singapore, on the west side; and also in Pahang.

*Calamus Guruba*, Buch.-Ham. Chenik, No. 193.

Distr: From the north southwards to Perak and Pahang.

*Amorphophallus* sp. Bukit Galing at Kuantan, No. 343.

*Homalonema rostratum*, Griff. Semantan road, No. 155.

Distr: Selangor and Pahang to Johore.

*Cryptocoryne cordata*, Griff. Balok, on Bukit Kapis, No. 213.

Distr: Malacca and Pahang.

*Eriocaulon sexangulare*, Linn. Tasek Chenik, No. 310.

Distr: Penang, Negri Sembilan, Malacca, Pahang, Johore, Singapore, and probably wider.

*Lepironia mucronata*, Rich. Tasek Chenik, No. 309.

Distr: Dindings to Singapore, on the west side; and on the east in Pahang.

*Rhynchospora aurea*, Vahl. Kuantan, No. 336.

Distr: Throughout the Peninsula.

*Andropogon Wightianus*, Steud. Kwala Pahang, No. 323.

Distr: Within the Peninsula only known from the Pahang coast.

*Thuarea sarmentosa*, Pers. Balok, No. 203.

Distr: On the coasts round the Peninsula.

*Spinifex squarrosus*, Linn. Kwala Pahang, No. 324.

Distr: On the east coast in Tringganu and Pahang; and on the west coast in northern Johore.

*Aspidium singaporeanum*, Baker. Six miles south-east of Temerloh, No. 177.

Distr: Throughout the Peninsula.

*Diplazium speciosum*, Mett. Temerloh, No. 176.

Distr: Apparently throughout the Peninsula.



*Asplenium macrophyllum*, Swartz. Tanjong Tembeling at Kuantan, No. 223.

Distr: All through the Peninsula, on the western side; from the eastern side only obtained as yet in Pahang.

*Lycopodium Phlegmaria*, Linn. Tanjong Tembeling at Kuantan, No. 224.

Distr: Throughout the Peninsula.

I. H. BURKILL.

## ORCHID NOTES.

So little is known of the botany of eastern Johore that it is of interest to record the receipt from Mr. St. V. B. Down, of the following three orchids collected by him on the Sedili river near Dohol:—

*Eria vestita*, Lindl.

*Eria velutina*, Lindl., 30 feet above the river on a *Lagerstroemia indica*, associated with *Drynaria*.

*Dendrobium Serra*, Lindl.

### ***Dendrobium crumenatum*, Sw.—the Pigeon-orchid.**

From Mr. F. J. Hallifax, President of the Municipal Commission, Singapore, the Gardens have received specimens of a salmon flowered *Dendrobium crumenatum*, Sw. The plant grows on Goodwood Hill, Singapore, uncultivated, in Mr. Hallifax's garden. Its stems are of a bright chestnut colour.

### ***Thecostele secunda*, Ridl.**

*Thecostele secunda*, Ridl., flowered in the Botanic Garden, in October, 1914, producing four downwardly directed (rigid, not pendulous) racemes with respectively 6, 7, 11 and 17 horizontal flowers. It flowered again in April, 1915. The plant was brought from Sarawak, by Mr. J. W. Anderson, in 1912. Its leaves measure 9 by 1½ inches.

A description of the colour of the flower is desirable. The interior sepal is honey-coloured with a slight claret flush outside near the tip and a light claret median line within in the lower half; the lateral sepals are similarly coloured but the line within is obscure. The lateral petals are honey-coloured becoming paler towards the tip, the margin below this pale part and the median line within being claret. The lip has on the median lobe a whitish ground with a well defined claret V in the centre and ill defined lateral Vs on each side of it merged into it at the contiguous extremities. These are formed by claret coloured hair; a small yellowish honey-coloured spot lies above the central V with a claret dot on each side of it,