

A PRELIMINARY PHYTOCHEMICAL SURVEY OF PLANTS IN CROCKER RANGE, SABAH, MALAYSIA

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ABSTRACT

A phytochemical screening of alkaloids, steroids or triterpenes and saponins was carried out on 103 leaf samples from 102 plant species representing 78 genera and 41 families. All plant materials were collected during the Crocker Range Scientific Expedition. From the samples screened, a total of 4, 19 and 53 leaf samples were found to give positive results for alkaloids, steroids/triterpenes and saponin, respectively.

INTRODUCTION

In Sabah, the earliest phytochemical screening activity was conducted by Arthur (1954) on plants collected in the area of Jesselton (now Kota Kinabalu), Gunung Kinabalu, Ranau and Keningau. A total of 205 plant species were screened for their chemical contents such as alkaloids, triterpenoids and saponins. There was a long period of inactivity until Said et al. (1987) reported results of a similar phytochemical screening of plants around Danum Valley Field Centre. As for Crocker Range, Ahmad and Mat-Salleh (1988) had reported some screening on 148 plant samples. Phytochemical screenings were also carried out on plants collected from Tawau Hills Park (Wan-Yaacob et al. 1995) and SayapKinabalu Park (Said et al. 1995). The last phytochemical screening reported was for alkaloidal contents of plants from Gunung Danum area (Wan-Yaacob et al. 2000).

The purpose of this note is to report the screening conducted on plant samples collected during the Crocker Range Scientific Expedition. Sampling areas include the Mahua Base Camp, Tikolod, Kimanis road and Ulu Sinagang.

MATERIALS AND METHODS

Plant samples were collected during the Crocker Range Scientific Expedition, which was conducted for 10 days in October 1999. Leaf samples for phytochemical screening were collected after taking voucher specimens for deposits at the Herbarium, Universiti Kebangsaan Malaysia (UKMB). Sample collection was limited to flowering and/or fruiting plant species for easier identification. In spite of that many collected samples are yet to be identified to species level. The presence of all alkaloids was determined using the method of Culvenor and Fitzgerald (1963). For steroids or triterpenes, the Liebermann-Burchard test was used (Said et al. 1990) and the froth test for saponins (Simes et al. 1959).

RESULTS AND DISCUSSION

The list of plant species is given in Table 1. A total of 103 flowering plant samples representing 102 species, 78 genera and 41 families were collected for screening.

Table 1. List of species screened for alkaloids, steroids and saponins (+ presence, - absence; 4+ strongly positive, 1+ weakly positive).

| FAMILY/SPECIES | Part | Voucher no. ALM | Alkaloid | Steroid/ Triterpene | Saponin | BSLT (ppm) |
|-----------------------------------|------|-----------------|----------|------------------------|---------|------------|
| Acanthaceae | | | | | | |
| <i>Filletia</i> sp. | L | 5126 | - | + | + | |
| <i>Justicia gendarussa</i> | L | 5258 | - | - | + | |
| <i>Semnostachya</i> sp. | L | 5274 | - | - | - | |
| Actinidaceae | | | | | | |
| <i>Saurauia</i> sp.1 | L | 5127 | - | + | + | |
| <i>Saurauia</i> sp.2 | L | 5270 | - | + | - | |
| Annonaceae | | | | | | |
| <i>Polyalthia aff. insignis</i> | L | 5336 | - | + | + | |
| Apocynaceae | | | | | | |
| <i>Alstonia angustifolia</i> | L | 5323 | 2+ | + | + | |
| <i>Parsonia alboflavescens</i> | L | 5338 | - | - | - | |
| Cecropiaceae | | | | | | |
| <i>Poikilospermum cordifolium</i> | L | 5315 | - | + | + | |
| Commelinaceae | | | | | | |
| <i>Commelina</i> sp. | L | 5139 | - | - | - | |
| <i>Pollia thyrsifolia</i> | L | 5135 | - | - | + | |
| Compositae | | | | | | |
| <i>Blumea</i> sp. | L | 5321 | - | - | + | |
| <i>Elephantopus mollis</i> | L | 5136 | - | + | - | |
| Convolvulaceae | | | | | | |
| <i>Jacquemontia paniculata</i> | L | 5243 | - | + | - | |
| Cunoniaceae | | | | | | |
| <i>Weinmania blumei</i> | L | 5324 | - | - | + | |
| Ebenaceae | | | | | | |
| <i>Diospyros</i> sp. | L | 5331 | - | + | + | |

Euphorbiaceae

| | | | | | |
|------------------------------------|---|------|----|---|----|
| <i>Antidesma cuspidatum</i> | L | 5273 | 2+ | - | 2+ |
| <i>Baccaurea lanceolata</i> | L | 5271 | - | - | - |
| <i>Bridelia glauca</i> | L | 5334 | - | - | - |
| <i>Bridelia stipularis</i> | L | 5353 | - | + | - |
| <i>Glochidion brunneum</i> | L | 5233 | - | - | + |
| <i>Glochidion hypoleucum</i> | L | 5292 | - | - | - |
| <i>Glochidion</i> sp. | L | 5311 | - | - | + |
| <i>Homalanthus caloneurus</i> | L | 5183 | - | - | - |
| <i>Mallotus philippensis</i> | L | 5327 | - | + | - |
| <i>Melanolepis multiglandulosa</i> | L | 5328 | - | - | + |
| <i>Bischofia javanica</i> | L | 5335 | - | - | + |

Fagaceae

| | | | | | |
|----------------------------|---|------|---|---|---|
| <i>Lithocarpus elegans</i> | L | 5251 | - | - | + |
| <i>Lithocarpus</i> sp. | L | | - | - | - |

Flacourtiaceae

| | | | | | |
|--------------------------|---|------|---|---|---|
| <i>Caseana velutinos</i> | L | 5332 | - | - | + |
|--------------------------|---|------|---|---|---|

Gesneriaceae

| | | | | | |
|--------------------------|---|------|---|---|----|
| <i>Cyrtandra chrysea</i> | L | 5300 | - | + | 2+ |
|--------------------------|---|------|---|---|----|

Guttiferae

| | | | | | |
|---------------------|---|------|---|---|---|
| <i>Garcinia</i> sp. | L | 5125 | - | - | - |
|---------------------|---|------|---|---|---|

Icacinaceae

| | | | | | |
|-------------------------------|---|------|---|---|----|
| <i>Gomphandra lysipetala</i> | L | 5290 | - | + | 3+ |
| <i>Gomphandra</i> sp. | L | 5263 | - | | - |
| <i>Stemonurus malaccensis</i> | L | 5285 | - | + | + |

Leeaceae

| | | | | | |
|---------------------|---|------|---|---|---|
| <i>Leea aequata</i> | L | 5337 | - | - | + |
| <i>Leea indica</i> | L | 5260 | - | - | - |

Leguminosae

| | | | | | |
|------------------------------|---|------|---|---|----|
| <i>Crotalana pallida</i> | L | 5218 | - | - | + |
| <i>Derris</i> sp. | L | 5254 | - | - | + |
| <i>Fordia splendidissima</i> | L | 5266 | - | - | 2+ |
| <i>Saraca declinata</i> | L | 5298 | - | - | - |
| <i>Senna tora</i> | L | 5351 | - | - | + |
| <i>Tephrosia vogelii</i> | L | 5210 | - | + | - |

Loganiaceae

| | | | | | |
|--------------------|---|------|---|---|----|
| <i>Fagraea</i> sp. | L | 5250 | - | + | 2+ |
|--------------------|---|------|---|---|----|

Melastomataceae

| | | | | | |
|---------------------------|---|------|---|---|----|
| <i>Anplectrum</i> sp. | L | 5313 | - | - | + |
| <i>Medinella speciosa</i> | L | 5317 | - | + | + |
| <i>Melastoma</i> sp. 1 | L | 5177 | - | + | 2+ |
| <i>Melastoma</i> sp. 2 | L | 5259 | - | - | + |

Moraceae

| | | | | | |
|------------------------------|---|------|---|---|----|
| <i>Ficus deltoidea</i> | L | 5203 | - | - | - |
| <i>Ficus endospermifolia</i> | L | 5320 | - | - | + |
| <i>Ficus macilenta</i> | L | 5310 | - | - | 2+ |
| <i>Ficus obscura</i> | L | 5131 | - | - | + |
| <i>Ficus racemosa</i> | L | 5358 | - | - | + |
| <i>Ficus septica</i> | L | | - | - | - |
| <i>Ficus sinuata</i> | L | | - | - | - |
| <i>Ficus</i> sp. | L | 5215 | - | - | - |

Myristicaceae

| | | | | | |
|------------------|---|------|---|---|---|
| <i>Knema</i> sp. | L | 5296 | - | - | - |
|------------------|---|------|---|---|---|

Myrsinaceae

| | | | | | |
|-------------------------|---|------|---|---|----|
| <i>Ardisia colorata</i> | L | 5267 | - | - | - |
| <i>Maesa ramentacea</i> | L | 5302 | - | - | 3+ |
| <i>Maesa procera</i> | L | 5217 | - | - | + |

Myrtaceae

| | | | | | |
|--------------------------------|---|------|---|---|----|
| <i>Decaspermum parviflorum</i> | L | 5252 | - | - | + |
| <i>Syzygium</i> sp. | L | 5278 | - | - | 2+ |

Nepenthaceae

| | | | | | |
|------------------------|---|------|---|---|---|
| <i>Nepenthes fusca</i> | L | 5222 | - | - | + |
|------------------------|---|------|---|---|---|

Oleaceae

| | | | | | |
|-------------------------------|---|--|---|---|---|
| <i>Chionanthus ramiflorus</i> | L | | - | - | - |
|-------------------------------|---|--|---|---|---|

Pandaceae

| | | | | | |
|-----------------------|---|------|---|---|---|
| <i>Galearia fulva</i> | L | 5239 | - | - | - |
|-----------------------|---|------|---|---|---|

Rhamnaceae

| | | | | | |
|---------------------------|---|------|---|---|----|
| <i>Alphitonia excelsa</i> | L | 5241 | - | - | 4+ |
|---------------------------|---|------|---|---|----|

Rhizophoraceae

| | | | | | |
|---------------------|---|--|---|---|---|
| <i>Carallia</i> sp. | L | | - | - | - |
|---------------------|---|--|---|---|---|

Rubiaceae

| | | | | | |
|-----------------------|---|------|---|---|---|
| <i>Ixora javanica</i> | L | 5284 | - | - | - |
|-----------------------|---|------|---|---|---|

| | | | | | |
|----------------------------------|---|------|----|----|----|
| <i>Lansianthus kinabaluensis</i> | L | 5262 | - | - | - |
| <i>Lasianthus maingayi</i> | L | 5283 | - | - | - |
| <i>Lansianthus rhinozerotis</i> | L | 5130 | - | - | - |
| <i>Morinda citrifolia</i> | L | 5354 | - | - | - |
| <i>Mussaenda</i> sp. | L | 5303 | - | - | - |
| <i>Pavetta axillaris</i> | L | 5275 | 2+ | 2+ | + |
| <i>Pleiocarpidia enneandra</i> | L | 5348 | - | - | + |
| <i>Pleiocarpidia suberosa</i> | L | 5236 | - | - | - |
| Rutaceae | | | | | |
| <i>Citrus macrocarpa</i> | L | 5269 | - | - | - |
| <i>Clausena excavata</i> | L | 5347 | - | - | + |
| <i>Melicope incana</i> | L | 5250 | - | - | + |
| <i>Micromelon minutum</i> | L | 5349 | - | - | - |
| <i>Murraya paniculata</i> | L | 5330 | - | - | - |
| Sapindaceae | | | | | |
| <i>Allophylus cobbe</i> | L | 5122 | - | - | + |
| <i>Guioa bijuga</i> | L | 5257 | - | - | 2+ |
| <i>Lepisanthes fruticosa</i> | L | 5345 | - | - | - |
| Solanaceae | | | | | |
| <i>Solanum nigrum</i> | L | 5140 | - | - | - |
| Sonneratiaceae | | | | | |
| <i>Duabunga mollucana</i> | L | 5318 | - | - | 2+ |
| Sterculiaceae | | | | | |
| <i>Kleinhovia hospita</i> | L | 5329 | - | - | 4+ |
| <i>Sterculia stipulata</i> | L | 5261 | - | - | - |
| Symplocaceae | | | | | |
| <i>Symplocos confusa</i> | L | 5214 | - | - | - |
| Theaceae | | | | | |
| <i>Eurya acuminata</i> | L | 5314 | - | - | - |
| <i>Schima wallichii</i> | L | 5319 | - | - | 2+ |
| <i>Ternstroemia coriacea</i> | L | 5174 | - | - | 3+ |
| Ulmaceae | | | | | |
| <i>Trema orientalis</i> | L | 5242 | - | - | - |
| Umbelliferae | | | | | |
| <i>Sanicula europea</i> | L | 5138 | - | - | + |

Urticaceae

| | | | | | |
|------------------------------|---|------|---|---|---|
| <i>Denrocnide elliptica</i> | L | 5123 | - | - | - |
| <i>Leucosyke capitellata</i> | L | 5276 | - | - | - |

Vitaceae

| | | | | | |
|---------------------------------|---|------|---|---|----|
| <i>Ampelocissus ochracea</i> | L | 5232 | - | - | - |
| <i>Tetrastigma diepenhostii</i> | L | 5265 | - | - | - |
| <i>Tetrastigma dubium</i> | L | 5228 | - | - | + |
| <i>Tetrastigma glabratum</i> | L | 5172 | - | - | - |
| <i>Tetrastigma hookeri</i> | L | 5237 | - | - | 2+ |
| <i>Tetrastigma pedunculare</i> | L | 5226 | - | - | + |

Alkaloids — Out of 103 samples screened only three (2.91%) species gave positive reaction for alkaloids. They are *Alstonia angustifolia* (Apocynaceae), *Antidesma cuspidatum*, and *Pavetta axillaris* (Rubiaceae).

Steroids/Triterpenes — Positive reactions were obtained from 22 samples (21.36%). This is comparatively normal for a phytochemical survey. Latiff and Said (1989) recorded a range of 21-27% positive reaction for steroids/triterpenes. Plants of Acanthaceae, Actinidiaceae, Annonaceae, Apocynaceae, Cercopiaceae, Compositae, Ebenaceae, Euphorbiaceae, Icacinaceae, Loganiaceae, Melastomataceae, Rubiaceae, Rutaceae, and Solanaceae gave positive reactions.

Saponins — A total of 55 species (53.92) gave positive reactions for saponins. Very strong reactions were observed in leaf samples belonging to *Gomphandra lysipetala* (Icacinaceae), *Maesa ramentacea* (Myrsinaceae), *Alphitonia excelsa* (Rhamnaceae), and *Kleinhovia hospita* (Sterculiaceae).

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