

## NOTES ON THE FLOWERING PLANTS OF TAWAU HILLS PARK, SABAH

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### ABSTRACT

*The flowering plants of Tawau Hills Park Sabah are as diverse as those of Tabin Wildlife Sanctuary, with the Rubiaceae, Euphorbiaceae, Melastomataceae and Annonaceae being the predominant families. Species-wise the genera Aglaia, Litsea and Polyalthia are predominant. A total of 169 species belonging to 112 genera and 52 families was collected from the area.*

### INTRODUCTION

The Tawau Hills Park is one of the state parks under Taman-Taman Sabah (Sabah Parks). It is located in the Tawau Division, in the extreme eastern part of Sabah, near the Kalimantan border of Indonesia. Unlike the other state parks such as Pulau Tiga, Gunung Kinabalu and Pulau Gaya, which have been quite extensively surveyed and botanized to some extent in the past, Tawau Hills Park has not been investigated for its diversity in flora and fauna. Herbarium records have shown that many interesting and rare plant species had been collected and named from the Tawau area. Though there is no enumeration or list of the plants of the Tawau Division in particular and Sabah in general, it became clear from the works of Willem Meijer in the early 1960s that the area is floristically rich. The possibility of the occurrence of Kalimantan elements in the area is high.

Geologically, the area is comprised of alluvial volcanic soils and lime-stone outcrops. Thus planting of cocoa and oil palm in the area is in high demand, especially on the volcanic soils. The area is hilly with few rivers and streams flowing out. It has three low hills, including Gunung Magdalena and Gunung Maria. Except for the northern part, the park area is almost an island, surrounded completely by the cocoa and oil palm estates. The flora of an isolated area like Tawau Hills Park has considerable phytogeographic interest.

### CHECKLIST OF FLOWERING PLANTS COLLECTED

The following checklist offers a preliminary inventory of the flowering plants occurring in the area. The results represent the collections and observations made during the expedition organized by Sabah Parks and Universiti Kebangsaan Malaysia Sabah Campus.

The taxa are arranged alphabetically, followed by the details of the collections. The specimens will be lodged at the Herbarium Universiti Kebangsaan Malaysia Sabah Campus (UKMS), the Herbarium of Taman Sabah at Gunung Kinabalu, Herbarium Universiti Kebangsaan Malaysia, Bangi (UKMB) and Herbarium of the Sabah Forestry Department at Sepilok (SAN). Where necessary a brief note is also given.

### ACTINIDIACEAE

Sometimes the genus *Saurauia* is classified under Saurauiaceae, a family now considered indistinct from the Actinidiaceae.

*Saurauia euryphylla* Airy-Shaw

Trail from base-camp to Ulu Sungai Tawau hot spring, aft. 160-21 Om,  
Sukup Akin *et al.*, SA 1426; SA 1430.

*S. amoena* Stapf

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1527; A. Latiff *et al.* ALM 3433,

*S. ferox* Korth.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1525.

### ALANGIACEAE

*Alangium ebenaceum* (C.B. Clarke) Harms

Trail from base-camp to Ulu sungai Tawau hot spring, alt. 160-10m,  
Sukup Akin *et al.*, SA 1460. This is one of the commonest species in the area and in Sabah.

### ANISOPHYLLEACEAE

*Anisophyllea disticha* (Jack) Baill.

Trail from base-camp to Ulu sungai Tawau hot spring, alt. 160-210m,  
Sukup Akin *et al.*, SA 1471; Ulu sungai Tawau, alt. 440-500m,  
Sukup Akin *et al.*, SA 1508; A. Latiff *et al.* ALM 3389, ALM 3382,

### ANNONACEAE

By far this is one of the commonest families observed throughout the collecting trips and elsewhere in Sabah (Mat Salleh *et al.*, 1989; Latiff *et al.*, 1987). Species of this family are easily recognized by their tripetalous characteristic and they are highly sought by phytochemists for their alkaloidal content. A total of 12 species belonging to 8 genera was collected and observed. One species each of *Artabotrys*, *Enicosanthum* and *Polyalthia* is yet to be identified.

*Artabotrys* sp.

Trail from base-camp to Ulu Sungai Tawau hot spring, Alt. 160-210m,  
Sukup Akin *et al.*, SA 1423.

*Enicosanthum sp.*

Trail from base-camp to Ulu Sungai Tawau hot spring, Alt. 160-210m, Sukup Akin *et al.*, SA 1472, A. Latiff *et al.* ALM 3428.

*Enicosanthum paradoxum* Becc.

Ulu Sungai Tawau, alt. 440-500, Sukup Akin *et al.*, SA 1519.

*Goniothalamus roseus* Stapf

Trail from base-camp to Ulu Sungai Tawau hot spring, Alt. 160-210m, Sukup Akin *et al.*, SA 1452.

*Goniothalamus uvarioides* King

Ulu Sungai Tawau, alt. 440-500m Sukup Akin *et al.*, SA 1507; A. Latiff *et al.* ALM 3376.

*Neouvaria aff. acumatissima* (Miq.) Airy -Shaw

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1425.

*Polyalthia bullata* King

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 16-210m, Sukup Akin *et al.*, SA 1433, A. Latiff *et al.* ALM 3328.

*Polyalthia sumatrana* (Miq.) Kurz

Ulu sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1511, A. Latiff *et al.* ALM 3361.

*Polyalthia sp.*

Ulu Sungai Tawau, alt. 200m, A. Latiff *et al.* ALM 3340.

*Popowia tomentosa* Maing. ex Hook. f.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1437, SA 1440, A. Latiff *et al.* ALM 3336, ALM 3356.

*P. odoardo* Diels

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1437, SA 1440, A. Latiff *et al.* ALM 3336, ALM 3356. This species is endemic to Borneo.

*Uvaria grandiflora* Roxb.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 145, SA 1470, A. Latiff *et al.* ALM 3423. This is one of the commonest species of the family Annonaceae. It is a woody, gigantic climber which produces large violet-coloured flowers.

**APOCYNACEAE**

Only one species of the family was collected, but has yet to be identified. Trail from base-camp to Ulu Sungai Tawau, alt. 200m, A. Latiff et al. ALM 343 8, indet.

**ARACEAE**

Two species of the family were collected but remained unidentified because of the lack of inflorescence, Determination of species of this family is difficult without fertile material,

*Aglaonema* sp.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin et al., SA 1434.

*Raphidophora* sp.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin et al, SA 1429; A. Latiff et al. ALM 3372.

**ARALIACEAE**

*Schefflera* sp.

Trail from base-camp to Ulu Sungai Tawau, alt. 150m, A. Latiff *et al.* ALM 3349.

**ASCLEPIADACEAE**

Two species were collected but remained unidentified.

*Dischidia* sp.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1466.

*Toxocarpus* sp.

Trail from base-camp to Ulu Sungai Tawau, alt. ca 200m, A. Latiff *et.al.* ALM 334.

**BALSAMINACEAE**

*Impatiens* sp.

Ulu Sungai Tawau, alt. 440-500M, Sukup, Akin *et al.*, SA 1530.

**BEGONIACEAE**

Both species of *Begonia* were very common in the area. They occur in moist habitats among debris on large boulders.

*Begonia beryllae* Ridl.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m,

Sukup Akin *et al.*, SA 1447; Ulu Sungai Tawau, alt. 440-500m,  
Sukup Akin *et al.* SA 1524; A. Latiff *et al.* ALM 332 1.

*B. burbidgei* Stapf

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m,  
Sukup Akin *et al.*, SA 1446; A. Latiff *et al.* ALM 3322.

## BIGNONIACEAE

*Bignonia pseudoptera*

Trail from base-camp to Ulu Sungai Tawau, alt. ca 200m, A. Latiff *et al.* ALM 3434.

## BOMBACACEAE

Only one species of this well-known genus was observed and collected.

*Durio lowianus* Scort. ex King

Trail from base-camp to Ulu Sungai Tawau, A. Latiff *et al.* ALM 3368.

## COMMELINACEAE

*Forrestia griffithii* C.B. Clarke

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1423, SA 1436; A. Latiff *et al.* ALM 3319.

*F mollis*

Trail from base-camp to Ulu Sungai Tawau, alt. ca. 150m, A. Latiff *et al.* ALM 3 317.

## CONNARACEAE

*Ellipanthus tomentosus* Kurz

Trail from base-camp to Ulu Sungai Tawau, alt. ca. 200m, A. Latiff ALM 3437, Indet. A. Latiff ALM 3375.

## CONVOLVULACEAE

*Erycibe borneensis* (Merr.) Hoogl.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1538. This is an endemic species of Borneo.

*Gynostemma pentaphylla*

Ulu Sungai Tawau, alt. 300m, A. Latiff *et al.* ALM 3384. Leaves of this climbing species have been used as an herbal tea in the neighbouring Philippines.

*Argyreia* sp.

Trail from base-camp to Ulu Sungai Tawau, alt. 200m, A. Latiff et al. ALM 3400.

### **EBENACEAE**

Surprisingly only one species of this family was collected from the area in spite of its wide distribution. More species occur in the Danum. Valley area.

*Diospyros diepenhorstii* Miq.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1490; A. Latiff et al. ALM 3443

### **EUPHORBIACEAE**

The members of this family are common in the area, especially in borders of cocoa estates where pioneer species such as *Macaranga* occur.

*Antidesma montanum* Blume

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1502; A. Latiff ALM 3347.

*A. neurocarpum* Miq.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1606; A. Latiff ALM 3389.

*A. persmile* Kurz

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1495.

*Baccaurea lanceolata* (Miq.) Muell-Arg.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1516; A. Latiff et al. ALM 3351.

Three other species of *Baccaurea* were collected but remain unidentified. For the time being they are designated with numbers.

*Baccaurea* sp. 1

Trail from base-camp to Ulu Sungai Tawau, alt. 200m, A. Latiff et al. ALM 3358.

*Baccaurea* sp. 2

Trail from base-camp to Ulu Sungai Tawau, alt. ca. 200m, A. Latiff et al. ALM 3432.

*Baccaurea* sp. 3

Near base-camp, A. Latiff et al. ALM 3346.

*Croton argyratus* Blume

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1517.

*Trigonostemon* aff. *borneensis* Merr.

Ulu Sungai Tawau, alt. 440-500m, Sukup Ain et al., SA 1539.

*Aporusa sp.*

Trail from base-camp to Ulu Sungai Tawau, alt. ca. 250m, A. Latiff *et al* ALM 3388.

*Macaranga tanarius* (L.) M.A.

Near base-camp, A. Latiff *et al.* ALM 3401.

*Claoxylon longifolium* (Bl.) Endl. ex Hassk.

Trail from base-camp to Ulu Sungai Tawau, alt. 200m, A. Latiff *et al.* ALM 3414.

## FAGACEAE

*Lithocarpus aff. caudatifolius* (Merr.) Rehd.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1514.

*Quercus sp.*

Trail from base-camp to Ulu Sungai Tawau, alt. 300m, A. Latiff *et al.* ALM 3390. It is expected that more taxa of this family will appear in areas at higher elevations.

## FLACOURTIACEAE

*Caesaria hosei* Merr.

Ulu Sungai Tawau, alt, 440-500m, Sukup Akin *et al.*, SA 1484.

*Hydnocarpus sp.*

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. ca 300m, A. Latiff *et al.* ALM 3403. This species is closely related to *H. anomala*.

## GESNERIACEAE

*Didymocarpus amoenus* C.B. Clarke

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1467.

*Cyrtandra cupulata*

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 200m, A. Latiff *et al.* ALM 3416.

## GNETACEAE

*Gnetum neglectum* Blume

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1474; A. Latiff *et al.* ALM 3331.

**HANGUANACEAE**

*Hanguana malayana* (Jack) Baill.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1508.

**LABIATAE**

*Gomphostemma* sp.

Trail from base-camp to Ulu Sungai Tawau hot springs, alt. 250m, A.Latiff et al. ALM 3426.

**LAURACEAE**

*Litsea ochraceae* (Blume) Boerl.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin et al., SA 1445; A. Latiff et al. ALM 3337.

*Litsea ferruginea* Blume

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1509; A. Latiff et al. ALM 3431.

*Litsea* sp. 1

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1483; A. Latiff et al. ALM 3348.

*Litsea* sp. 2

Ulu Sungai Tawau, alt. 300m, A. Latiff et al. ALM 3408.

*Eusideroxylon zwageri*

Trail from base-camp to Ulu Sungai Tawau, alt. 200m, A. Latiff et al. ALM 3404.

**LEGUMINOSAE**

*Millettia* sp.,

Trail from base-camp to Ulu Sungai Tawau, alt. ca. 200m, A. Latiff et al. ALM 3363.

*Bauhinia* sp.

Trail from base-camp to Ulu Sungai Tawau, alt. 200m, A. Latiff ALM 3412.

Indet. A. Latiff et al. ALM 344 1.

**LORANTHACEAE**

*Helixanthera* sp.

Trail from base-camp to Ulu Sungai Tawau, alt. ca. 300m, A. Latiff et al. ALM 3392.

*Loranthus sp.*

Trail from base-camp along Sungai Tawau, alt. ca. 200m, A. Latiff *et al.* ALM 3339, ALM 3391.

## MAGNOLIACEAE

*Magnolia candolii* (Bl.) H. Keng var. *obovata* (Korth.) Nooteb.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1522.

## MELASTOMATACEAE

*Clidemia hirta* (L.) D. Don

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1469.

*Kibessia azurea* (Bl.) DC.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.* SA 1457.

*Medinilla crassifolia* Bl.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1451; SA 1464; Ulu Sungai Tawau, alt. 440 - 500m, Sukup Akin SA 1529; A. Latiff *et al.* ALM 3324.

*M alternifolia*. B 1.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1537.

*M stephanostegla* Stapf

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1526.

*M scortechinii* King

Trail from base-camp along Sungai Tawau, alt. ca. 200m, A. Latiff ALM 3365.

*Memecylon costatum* Miq.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1462; Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1498, SA 1505.

*Memecylon sp.*

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1459; A. Latiff *et al.* ALM 3418.

*Dissochaeta gracilis* (Jack) Blume

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1493.

*Sonerila* sp.

Ulu Sungai Tawau, alt. ca 300m, A. Latiff et al. ALM 314.

*Marumia* sp.

Ulu Sungai Tawau, alt. ca. 350m, A. Latiff et al. ALM 3369.

*Blastus caudatus*

Trail from base-camp to Ulu Sungai Tawau hot springs, alt. ca. 350m, A. Latiff et al. ALM 3378. Indet., A. Latiff et al. ALM 3381.

## MELIACEAE

*Aglaia beccarii* C. DC.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin et al., SA 1424, SA 1535; A. Latiff et al. ALM 3393.

*A. aspera* Teijsm. & Binn.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 18 1; A. Latiff et al. ALM 3345.

*A. elliptica* Blume

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1486; SA 1494; SA 1513; SA 1534; SA 1544.

*A. aff. leptantha* Miq.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1492.

*A. odoratissima* Bl.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1518.

*Aglaia* sp. 1

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1487.

*Aglaia* sp. 2

Ulu Sungai Tawau, alt. 440-500m, A. Latiff et al. ALM 3377.

*Aphanaixis* sp.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1545.

*Dysoxylum undulatum* Hend.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1542; A. Latiff et al. ALM 3329.

*Dysoxylum* sp.

Trail from base-camp to Ulu Sungai Tawau hot springs, alt. ca. 300m, A. Latiff et al. ALM 3429.

**MONIMIACEAE**

*Matthaea sancta* Bl.

Trail from base-camp along Sungai Tawau, alt. 250m, A. Latiff et al. ALM 3417.

**MORACEAE**

*Artocarpus* sp.

Trail from base-camp along Sungai Tawau, aft. ca. 300m, A. Latiff et al. ALM 3366.

*Ficus* sp. 1

Trail from base camp to Hotsprings, alt. 300m, A. Latiff et al. ALM 3366.

*Ficus* sp. 2

Trail from base-camp to Hotsprings, alt. ca. 300m, A. Latiff et al. ALM 3405.

**MYRISTICACEAE**

*Knema laurina* Wall.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1500.

*Gymnacranthera bancana* (Miq.) Sind

Trail from base-camp along Sungai Tawau, alt. ca. 300m, A. Latiff et al. ALM 3402.

**MYRSINACEAE**

*Ardisia virens* Kurz

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin et al., SA 1463; Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., 1482; A. Latiff et al. ALM 3327.

*A. pyramidalis* (Cav.) Pers.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1489; A. Latiff et al. ALM 3439.

*Ardisia* sp. 1

Trail from base-camp to Hotsprings, alt. 250m, A. Latiff et al. ALM 3367.

*Ardisia* sp. 2

Trail from base-camp along Sungai Tawau, alt. ca 300m, A. Latiff et al. ALM 3350.

*Labisia pumila*

Trail from base-camp along Sungai Tawau, alt. *ca.* 250m, A. Latiff *et al* ALM 3380.

*Embelia sp. 1*

Trail from base-camp to hot springs, alt. *ca.* 300m, A. Latiff *et al* ALM 3415.

*Embelia sp. 2*

Trail from base-camp along Sungai Tawau, alt. *ca.* 250m, A. Latiff *et al.* ALM 3 399.

**OPILIACEAE***Lepionurus aff. sylvestris Bl.*

Trail from base-camp to Ulu Surgai Tawau hot spring, alt. *ca.* 200m, A. Latiff *et al.* ALM 3 397.

**ORCHIDACEAE**

In spite of to other research groups collecting the orchids, a few species were collected as they appeared in our paths.

*Eulophia sp.*

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1473.

*Calanthe pulchra* (Bl.) Lindl.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1543.

*Habenaria sp.*

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1536.

**OXALIDACEAE***Sarcotheca sp.*

Trail from base-camp along Sungai Tawau, alt. *ca.* 250m, A. Latiff *et al.* ALM 3411.

**PASSIFLORACEAE**

The only species of the family collected remains unidentified. A. Latiff *et al.* ALM 3407

**PIPERACEAE**

Three species of Piper were collected but their identification proved difficult.

*Piper sp. 1*

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup akin *et al.*, SA 1427; A. Latiff *et al.* ALM 3335.

*Piper sp. 2*

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1438; A. Laiff *et al.* ALM 3425.

*Piper sp. 3*

Trail from base-camp to Ulu Sungai Tawau hot spring, Sukup Akin *et al.*, SA 1453; A. Latiff *et al.* ALM 3444.

**POLYGALACEAE***Xanthophyllum sp.*

Trail from base-camp along Sungai Tawau, alt. ca 250m, A. Latiff *et al.* Id. ALM 3334, ALM 3344.

**RUBIACEAE**

Other than the Annonaceae and Euphorbiaceae, the Rubiaceae also proved to be among the families most commonly encountered. A total of 22 species was collected.

*Acranthera multiflora* Val.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1428; Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1528.

*Argostemma homelifolium* Wernh.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1476.

*A. moultonii* Ridl.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1431.

*Canthium confertum* Korth.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1512, SA 1504.

*Cephalis aff. psychotrioides* Val.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1468.

*Chasalia sp.*

Trail from base-camp along Sungai Tawau, alt. ca. 250m, A. Latiff *et al.*, ALM 3343, ALM 3370. Indet, A. Latiff *et al.* ALM 3320.

*Hedyotis rigida* (131.) Miq.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1477.

*Lasianthus maingayi* Hook. f,

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1465; A. Latiff *et al.* ALM 3323.

*Lasianthus spathulatus* Miq.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SAI 533.

*Mussaenda* sp.

Trail from base-camp to hot springs, alt. ca 300m, A. Latiff *et al.* ALM 3382.

*Myrmeconauclea stipulacea* Ridsd.

Ulu Sungai Tawau, alt 440-500m, Sukup Akin *et al.*, SA 153 1, SA 1520.

*Myrinoneuron cyaneum* Hall. f

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1532.

*Nauclea subidita*

Trail from base-camp along Sungai Tawau, alt. ca. 300m, A. Latiff *et al.* ALM 3338.

*Pavetta axillaris* Bremek.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1478; A. Latiff *et al.* ALM 3353.

*Pavetta* sp.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1422; A. Latiff *et al.* ALM 3371.

*Peiocarpidia capitata* Brennek.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1443; Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1499; Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 1444.

*Praravinia suberosa* (Merr.) Brennek.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, s.n.

*Psychotria aff. aurantiaca* Wall.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin *et al.*, SA 142 1.

*P. woodii* Meff .

Trail from base-camp to Ulu Sungai Tawau hot springs, alt. 160-210m, ,Sukup Akin *et al.*, SA 1454, SA 1461; Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 1454, SA 1461; Ulu Sungai Tawau, alt. 440-500m, Sukup Akin *et al.*, SA 149 1, SA 1503, SA 1521.

*Saprosma* sp.

Trail from base-camp along Sungai Tawau, alt. ca 300m, A. Latiff et al ALM 3355.

*Urophyllum* aff. *glabrum* Jack

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1501; A. Latiff et al. ALM 3318.

## RUTACEAE

*Pleiospermum latifolium*

Trail from base-camp along Sungai Tawau, alt. ca. 250m, A. Latiff et al. ALM 3387

## SAPINDACEAE

*Allophyllus cobbe* (L.) Reusch.

Trail from base-camp along Sungai Tawau, alt. ca. 300m, A. Latiff et al. ALM 3385.

## SAPOTACEAE

*Icosandra* sp.

Trail from base-camp to Ulu Sungai Tawau, alt. ca. 400m, A. Latiff et al. ALM 3325.

## SMILACACEAE

*Smilax gigantea* Merr.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1485.

## SOLANACEAE

*Lycianthes biflora* (Lour.) Bitter

Trail from base-camp to Ulu Sungai Tawau hot spring, atl. 160-21m, Sukup Akin et al., SA 1480; A. Latiff et al. ALM 3354.

*Solanum nigrum*

Trail from base-camp along Sungai Tawau, alt. ca. 300m, A. Latiff et al. ALM 3435.

## STERCULIACEAE

*Sterculia coccinea* Jack

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin ef al., SA 1456; A. Latiff er al. ALM 3357.

**SYMPLOCACEAE**

*Symplocos* Sp.

Trail from base-camp to Ulu Sungai Tawau, alt. ca. 300m, A. Latiff et al. ALM 3359.

**TILIACEAE**

*Microcos pearsonii* Merr

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1515.

*M crassifolia* Burret

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1541.

*Grewia fibrocarpa* Mast.

Trail from base-camp along Sungai Tawau, alt. ca. 300m, A. Latiff et al. ALM 3316.

**ULMACEAE**

*Trema tomentosa* (Roxb.) Hara

Trail along Sungai Tawau, alt. ca. 200m, A. Latiff et al. ALM 3427.

**URTICACEAE**

*Dendrocnide* sp.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin et al., SA 1435.

*Poikilosermum cordifolium* (Borg-Pet.) Merr

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1523.

*Debregeasia* sp.

Trail from base-camp along a small tributary of Sungai Tawau, alt. 250m, A. Latiff et al. ALM 3424. Indet., A. Latiff et al. ALM 3409

**VERBENACEAE**

*Callicarpa arborea* Roxb.

Trail from base-camp along Sungai Tawau, alt. ca 250m, A. Latiff et al, ALM 3413.

*Callicarpa* sp. I

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin et al., SA 1442.

*Callicarpa* sp. 2

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1540.

*Clerodendrum scandens* Poir.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al, SA 1547; A. Latiff et al., ALM 3315,

**VITACEAE***Cayratia geniculata* (Bl.) Gagnep.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin et al, SA 1479; A. Latiff et al. ALM 3410. This is one of the commonest species of *Cayratia* in Borneo.

*C. corniculata* (Benth.) Gagnep.

Trail from base-camp along Sungai Tawau, alt. ca. 250m, A. Latiff et al. ALM 3406. This is an Asiatic species that extends its southern-most range to Borneo. In Malesia this species has only been recorded from Sabah and Kalimantan.

*Pterisanthes quinquefoliolata* Merr .

Trail from base-camp, A. Latiff et al ALM 3311. This species is endemic to Sabah.

*Ampelocissus ochracea* (T. & B.) Merr.

Trail from base-camp to Ulu Sungai Tawau hot springs, alt. ca 300m, A. Latiff et al ALM 3312.

*A. thysiflora* (131.) Planch.

Trail from base-camp along Sungai Tawau, alt. ca 300m, A. Latiff et al ALM 3359.

*A. filipes* Planch.

Trail from base-camp along Sungai Tawau, alt. ca. 250m, A. Latiff et al. ALM 3398. In Malesia this species only occurs in Borneo, Sumatra, and the Malay Peninsula.

*Cissus angustifolia* Ridl.

Trail from base-camp along Sungai Tawau, alt. ca. 300m, A. Latiff et al. ALM 3313. This species is endemic to Borneo.

*Leea indica* (Burm. f.) Merr.

Trail along Sungai Tawau, alt, 200m, A. Latiff et al ALM 3356.

*Tetrastigma dubium* (Laws.)

Trail from base-camp to Ulu Sungai Tawau hot springs, alt. ca. 300m, A. Latiff et al. ALM 3333, ALM 3440.

## ZINGIBERACEAE

*Globba pendula* Roxb.

Trail from base-camp to Ulu Sungai Tawau hot spring, alt. 160-210m, Sukup Akin et al., SA 1449; Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1488.

*Amomum* sp.

Ulu Sungai Tawau, alt. 440-500m, Sukup Akin et al., SA 1497; A. Latiff et al. LM 3883.

*Zingiber* sp.

Trail from base-camp along Sungai Tawau, alt. ca. 250m, A. Latiff et al ALM 3395.

## DISCUSSION

During the expedition a total of 242 collections was obtained. These belong to 52 families, 112 genera and 169 species. The number of taxa collected and enumerated shows very clearly that the flora of the Tawau Hills Park is under-collected. An extensive survey was impossible during the expeditions, especially in hilly areas, due to lack of time. Several team members fell sick after being stung by ground hornets while collecting. The families Rubiaceae, Euphorbiaceae, Melastornataceae, and Annonaceae are predominant in the collections. They are represented by many individuals and taxa. Among the genera, *Aglaia*, *Litsea* and *Polyalthia* are represented by more than five species. Ten families are represented by a single species and 14 families are represented by only two species each.

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