

## A Botanical Survey of Sungei Buloh Nature Park, Singapore

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### Abstract

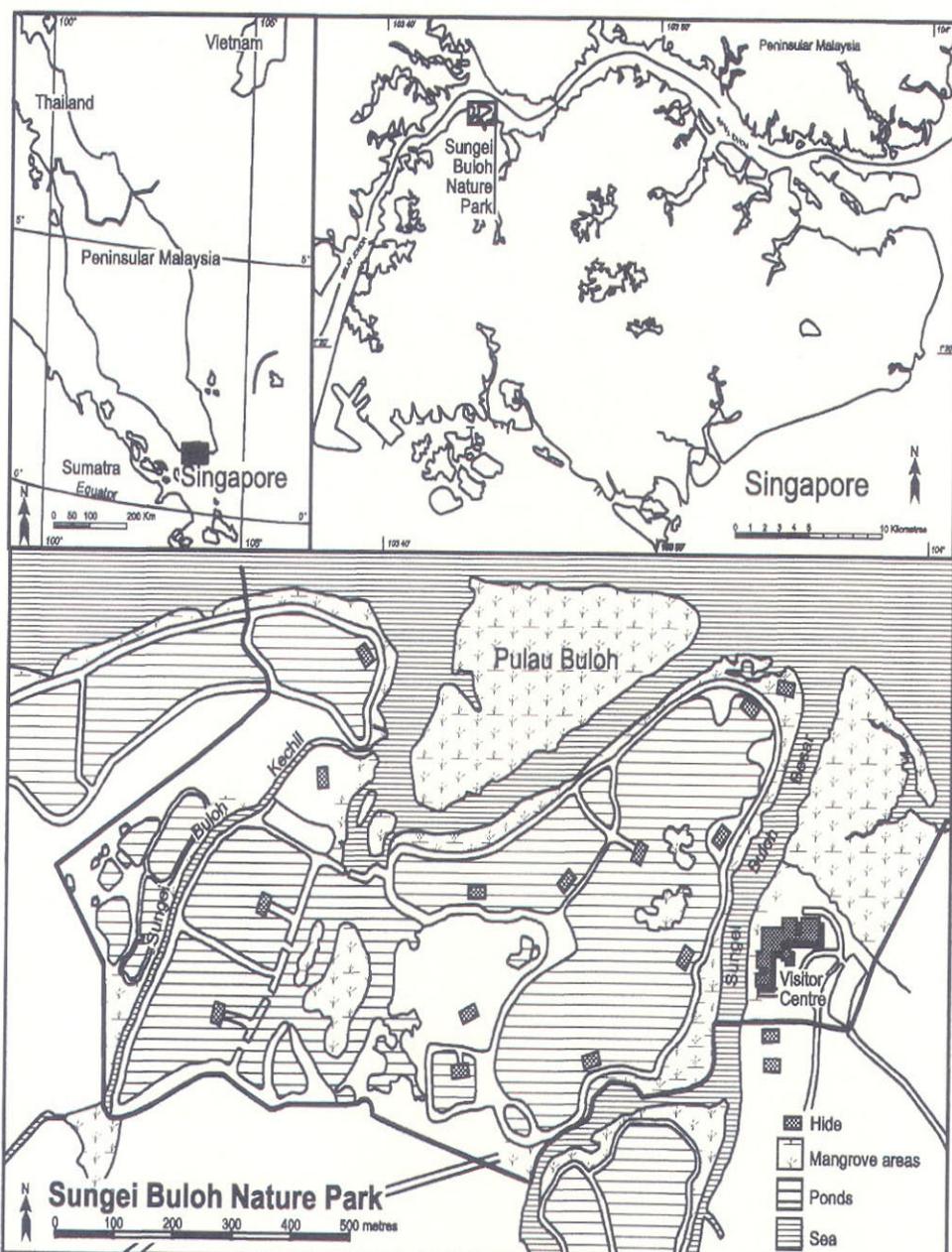
A total of 249 wild vascular plant species (15 ferns, 1 gymnosperm, 233 angiosperms) were collected on a succession of trips between 1991 and 1993 to the Sungei Buloh Nature Park. The current flora includes mangrove and beach or coastal forest species but the majority are early successional, native and exotic weeds and species associated with cultivation. Earlier collections from the Herbarium, Singapore Botanic Gardens, dating from the late 1880s to the early 1900s were also included and these totalled 76 (1 club moss, 7 ferns and 68 angiosperms). The original flora was very different and consisted mainly of lowland, or beach or coastal forest, and mangrove species. The great change in species composition and the high number of weedy species in the current flora reflect major man-made changes to the environment. Combining both historical and recent collections, the wild vascular plant flora of Sungei Buloh Nature Park totals 318 species (1 club moss, 21 ferns, 1 gymnosperm and 295 angiosperms).

### Introduction

Sungei Buloh Nature Park, including Pulau Buloh, consists of 87 ha of land (Fig. 1). A botanical survey was conducted to provide baseline information for future reintroduction or introduction programmes.

### Site

Sungei Buloh Nature Park is situated in the north-western coast of Singapore island ( $N1^{\circ}42'53.5''$   $E103^{\circ}43'30.8''$ ). The proposal to set up this park and its infrastructure was approved by the Master Plan Committee



**Figure 1. Maps of Singapore and Sungei Buloh Nature Park.** Above left, position of Singapore in relation to Peninsular Malaysia; above right, map of Singapore showing the position of Sungei Buloh Nature Park; bottom, Sungei Buloh Nature Park.

on the 29th March 1990 and the park was officially opened on the 6th December 1993.

The park is a wetland area and consists of three main parts: the reserve proper, the Visitor Centre area and Pulau Buloh, an island north of the reserve area (Fig. 1). The river, Sungei Buloh Besar separates the reserve proper from the Visitor Centre. Both Pulau Buloh and the Visitor Centre area consist mainly of mangrove as well as man-made brackish and freshwater ponds in the reserve proper. The site was marked for preservation by the Singapore government as it is used by large numbers of coastal birds, including the black-crowned night-heron (*Nycticorax*

*nycticorax*), common greenshank (*Tringa nebularia*), common redshank (*Tringa totanus*), curlew sandpiper (*Calidris ferruginea*), grey heron (*Ardea cinerea*), marsh sandpiper (*Tringa stagnatilis*), Pacific golden plover (*Pluvialis fulva*) and whimbrel (*Numenius phaeopus*).

### History of Land Use

According to the 1890 Straits Settlement Government Gazette Reports of the Botanic Gardens, the Sungei Buloh area was a forest reserve from 17th April 1890 and "Consists entirely of mangrove swamp". However, this "area of 1,128 acres, 3 roods (sic) and 18 poles, more or less" (approximately 457 ha) ceased to be a forest reserve on 4th April 1938 (Straits Settlement Government Gazette, 1938).

When first designated as forest reserve in 1890, the area appeared to be entirely mangrove. Records as to when prawn and fish ponds were constructed are not available but with the development of farms, the mangroves were cleared. Native species were replaced by cultivated species for consumption by the farmers or their livestock. The farms and ponds were abandoned in 1989, when the Government took over the site, after which time early successional and weedy species invaded the area.

### Methods

The present survey consisted of collection trips made on 22nd May, 30th August and 7th October 1991 and 27th September and 13th October 1993. The park was divided into sectors where the collecting teams concentrated their efforts. Representative specimens of all wild species, whether sterile or not, were collected and made into herbarium specimens which were deposited in the Herbarium, School of Biological Sciences, The National University of Singapore (SINU). Specimens were identified by comparison with descriptions in floras or recent revisions, as well as with named specimens in the Herbarium, Singapore Botanic Gardens (SING). Historical collections from Sg. Buloh at SING were examined. Nomenclature and habitat data mostly follow those of Turner (1995).

### Observations and Discussion

A total of 249 wild vascular plant species were collected in the survey (Appendix 1) and included 15 ferns, 1 gymnosperm (*Podocarpus polystachyus*) and 239 angiosperms.

Most plants are characteristic of a highly disturbed environment. The Sg. Buloh area presumably became highly disturbed when the prawn and fish farms were established and the mangrove cleared and earth excavated to create the ponds. Not much regeneration could take place as the farmers would have to keep the mangroves out of the ponds and the bund areas. Together with human settlement, there would be planting of vegetable crops, fruit trees, spice, flavouring and ornamental plants.

When the government took over the site in 1989, soil was brought in from other parts of Singapore. The latter is the most likely seed source for the large number of exotic and native weed species, such as *Ageratum conyzoides*, *Kyllingia polyphylla*, *Panicum maximum* and *Pityrogramma calomelanos*. Exotic pioneer tree species include *Acacia auriculiformis*, *Manihot glaziovii*, *Muntingia calabura* and *Spathodea campanulata*. If left unchecked, *Acacia auriculiformis* may dominate those areas which are not flooded at high tide.

Weed species considered native also make up a significant part of the flora and include *Centella asiatica*, *Eulophia graminea*, *Imperata cylindrica* and *Vernonia cinerea*.

Secondary forest would have developed after the clearance of the original primary forest. Its species include *Alstonia angustiloba*, *Melastoma malabathricum*, *Trema* spp. and *Vitex pinnata*.

The beach or coastal forest and mangrove species are probably remnants of the original forest. Mangrove and its components include *Acrostichum* spp., *Bruguiera* spp., *Hibiscus tiliaceus* and *Rhizophora* spp.

Species escaped or persisting from cultivation include vegetables such as *Coccinia grandis*, *Ipomoea batatas* and *Manihot esculenta*, fruit trees such as *Annona muricata*, *Artocarpus heterophyllus*, *A. integer*, *Carica papaya*, *Durio zibethinus* and *Psidium guajava*, spice or flavouring plants such as *Murraya koenigii* and *Pandanus amaryllifolius*, as well as ornamental plants such as *Celosia argentea*, *Dieffenbachia seguine*, *Tabebuia rosea* and *Vernonia elliptica*.

Based mostly on the conservation status ascribed by Turner *et al.* (1995), 2 endangered species (*Cassine viburnifolia* and *Podocarpus polystachyus*), 6 vulnerable species, 58 rare species and 90 common species were collected. For the exotic species, 66 are naturalized and 28 associated with cultivation, making up about 37.8% of the total vascular plant flora. This indicates the great disturbance in the area.

There are 12 fern families, each with only one species except for the Pteridaceae with three, and the Polypodiaceae with two. The single gymnosperm is *Podocarpus polystachyus*. Angiosperms dominate the park. The largest ten families, in descending order are: Gramineae (25 species), Papilionaceae (16), Compositae (15), Cyperaceae (12), Euphorbiaceae (11),

Mimosaceae (9), Rubiaceae (9), Convolvulaceae (8), Moraceae (7) and Verbenaceae (7). Again, weed and secondary forest species are the main representatives of these families. Other families had six or fewer species and 37 families had only one species each.

Appendix 2 lists the plants collected by H.N. Ridley, J.S. Goodenough, and L.C. Corporal between 1889 and 1911. This list is by no means representative of the whole area as they comprise opportunistic collections in the area. A total of 76 vascular plant species were recorded with one club moss (*Lycopodiella cernua*), 7 ferns and 68 angiosperms.

The species they collected are very different from those found in the recent survey. Of the 76, only 6 species were recollected, *Excoecaria agallocha*, *Gynochthodes sub lanceolata*, *Hoya verticillata* var. *verticillata*, *Ilex cymosa*, *Lygodium microphyllum* and *Oxyceros longiflora*. Many species previously collected are native climbers, epiphytes, lowland beach or mangrove forest species. Beach or coastal forest species include *Asplenium macrophyllum*, *Dischidia benghalensis*, *Garcinia hombroniana*, *Hoya verticillata* var. *verticillata* and *Oncosperma tigillarium*.

Most climbers were not recollected except for *Cayratia mollissima*, *Gynochthodes sub lanceolata*, *Lygodium microphyllum* and *Oxyceros longiflora*. The change in the flora reflects the change in the environment. Tall trees would have had to be present to support the epiphytes and climbers. Probably these were logged during land clearance and *Oncosperma tigillarium* trunks were probably used for *kelong* poles. It is interesting to note that the largest family in the historical collections, the Orchidaceae with 27 species, has not a single species left today. Most orchids are epiphytes of lowland forest or mangrove trees. All except *Bulbophyllum membranaceum* and *Claderia mayeriana* are now extinct in Singapore and both the surviving species are considered vulnerable to extinction (Turner *et al.*, 1995). At present, only the weedy, terrestrial orchid, *Eulophia graminea* is present. All the epiphytic members of the Melastomataceae are also now extinct at Sg. Buloh and *Medinilla crassifolia* and *Plethiandra sessiliflora* are also extinct in Singapore.

Mangrove tree species are not among the earlier collections made by Ridley, Corporal or Goodenough, thus it is difficult to confirm if mangroves were present then. (*Excoecaria agallocha* is the closest to a mangrove tree species in their collections.) They were possibly discriminating collectors and ignored the mangrove trees, which were plentiful in other parts of the island. Indirect evidence of the existence of mangroves are the orchid species that were collected from the Sg. Buloh area and which are associated with mangroves. These include *Bulbophyllum concinnum*, *Bulbophyllum restrepia*, *Dendrobium spegidoglossum*, *Dendrobium spurium*, *Eria neglecta* and *Flickingeria xantholeuca*, all of which are now extinct in Singapore.

(Turner *et al.*, 1995).

The name 'Sungei Buloh' is also very probably indicative of the presence of bamboo (Malay, *buloh*). No native bamboos were collected by past collectors or in this survey. (*Bambusa vulgaris*, a relic of cultivation, was the only bamboo collected in the recent survey.) As mentioned earlier, the past collectors may have ignored species which were common elsewhere on the island. Bamboos also tend to be sterile most of the time because of their generally infrequent flowering and collectors often collect only flowering and/or fruiting material.

Based on the recent survey of Singapore bamboos by Chua, Soong and Tan (1996) there are only four native bamboo species: *Gigantochloa ligulata* Gamble, *Schizostachyum gracile* (Munro) Holttum, *Schizostachyum latifolium* Gamble and *Soejatmia ridleyi* (Gamble) K.M. Wong. *Gigantochloa ligulata* is a recent new record for Singapore. It is unlikely to have grown at Sungei Buloh eighty years ago. *Soejatmia ridleyi* is an inland forest species, not associated with coastal areas and is currently found only at the Bukit Timah Nature Reserve, Singapore (Chua, Soong and Tan, 1996). Both *Schizostachyum gracile* and *Schizostachyum latifolium* may have grown at Sg. Buloh as both are common and grow at forest edges or riversides. Unfortunately, both are now extinct in Singapore.

Based on the conservation status ascribed by Turner *et al.* (1995) to species in Singapore, of the historical collections 30 species are now extinct, 3 endangered, 9 vulnerable, 27 rare, one common and two unknown. Three are endemic species and are found only in Singapore and Peninsular Malaysia: *Plethiandra sessiliflora*, *Rhopaloblaste singapurensis* and *Stachyphrynum griffithii*.

In terms of diversity, the current flora appears larger. This can be explained in two ways. Firstly, the survey was comprehensive and all species were collected, whereas the early collectors presumably concentrated only on the fertile material or what was of interest to them. Secondly, many species are weeds and are the result of disturbance caused by the prawn and fish farming and the construction of the park.

## Acknowledgements

We are grateful to the staff of the Sungei Buloh Nature Park and National Parks Board for their help and cooperation. We would also like to express our appreciation to the Director of the Singapore Botanic Gardens, for the use of the herbarium facilities and to the Director, National Archives of Singapore, for the use of maps and records. Last but not least, we would like to express our appreciation to Chew Ping Ting, Kong Hui Ai, M.

Matthews and Y.C. Wee for their help in the survey and to K. S. Chua for drawing the figure. This research was partially supported by The National University of Singapore research grants RP 880301, RP 930325 and RP 960362.

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**Appendix 1. Recent collections from Sungei Buloh Nature Park.** Conservation status: C = common; N = endangered; R = rare; V = vulnerable; A = naturalized exotic species (aliens); S = species escaped or persisting from cultivation.

## PTERIDOPHYTA

### Adiantaceae

- A *Pityrogramma calomelanos* (L.) Link; K.S. Chua & Y.C. Wee CKS & WYC 506

### Blechniaceae

- C *Stenochlaena palustris* (Burm.f.) Bedd.; K.S. Chua & Y.C. Wee CKS & WYC 513; M.F. Choong VC 12

### Aspleniaceae

- C *Asplenium nidus* L.; M.F. Choong VC 65; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1053

### Davalliaceae

- C *Davallia denticulata* (Burm.f.) Mett.; I.M. Turner & M.F. Choong SB 1045

### Azollaceae

- A *Azolla pinnata* R.Br. ssp. *asiatica* R.M.K. Saunders & K. Fowler; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3114

### Dennstaedtiaceae

- V *Pteridium esculentum* (G.Forst.) Cockayne; K.S. Chua & Y.C. Wee CKS & WYC 505; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3060

**Gleicheniaceae**

- C *Dicranopteris linearis* (Burm.f.) Underw.; K.S. Chua & Y.C. Wee CKS & WYC 504

**Oleandraceae**

- C *Nephrolepis auriculata* (L.) Trimen; Haji Samsuri bin Haji Ahmad SA.66; K.S. Chua & Y.C. Wee CKS & WYC 477; M.F. Choong VC 60

**Parkeriaceae**

- C *Ceratopteris thalictroides* (L.) Brongn.; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3113

**Polypodiaceae**

- C *Pyrossia lanceolata* (L.) Farwell; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1056
- C *Pyrossia piloselloides* (L.) M.G. Price; Haji Samsuri bin Haji Ahmad SA.56; I.M. Turner & M.F. Choong SB 1095; I.M. Turner & M.F. Choong SB 1037; I.M. Turner & M.F. Choong SB 1097

**Pteridaceae**

- C *Acrostichum aureum* L.; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1033; M.F. Choong VC 84; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1033
- C *Acrostichum speciosum* Willd.; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3000; P.T. Chew, H.A. Kong & J.W.H. Yong SB 13; P.T. Chew, H.A. Kong & J.W.H. Yong SB 13
- C *Pteris vittata* L.; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3030

**Schizaeaceae**

- C *Lygodium microphyllum* (Cav.) R.Br; I.M. Turner & M.F. Choong SB 1090

**PINOPHYTA****Podocarpaceae**

- N *Podocarpus polystachyus* R.Br. ex Endl.; P.T. Chew, H.A.Kong & J.W.H. Yong SB 1016; Haji Samsuri bin Haji Ahmad SA.25

**MAGNOLIOPHYTA****Acanthaceae**

- R *Acanthus ebracteatus* Vahl; Haji Samsuri bin Haji Ahmad SA.70; I.M. Turner & M.F. Choong SB 1086; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1021; P.T. Chew, H.A. Kong & J.W.H. Yong SB 16

- R *Acanthus ilicifolius* L.; Haji Samsuri bin Haji Ahmad SA.44; I.M. Turner & M.F. Choong SB 1085

- R *Acanthus volubilis* Wall.; K.S Chua & Y.C. Wee 487; M.F. Choong VC 79

- A *Asystasia gangetica* (L.) T.Anderson ssp. *gangetica*; M.F. Choong VC 124; M.F. Choong VC 126

- C *Asystasia gangetica* (L.) T.Anderson ssp. *micrantha* (Nees) Ensermu; Haji Samsuri bin Haji Ahmad SA 43; K.S. Chua & Y.C. Wee CKS & WYC 516; M.F. Choong VC 55; P.T. Chew, H.S. Kong & J.W.H. Yong SB 1003

**Aizoaceae**

- R *Sesuvium portulacastrum* (L.) L.; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3058

**Amaranthaceae**

- A *Amaranthus caudatus* L.; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1025

- A *Amaranthus spinosus* L.; M.F. Choong SB 2

- A *Celosia argentea* L.; M.F. Choong VC 118

**Anacardiaceae**

- S *Mangifera indica* L.; M.F. Choong VC 138

**Annonaceae**

- S *Annona muricata* L.; K.S. Chua & Y.C. Wee 483; Haji Samsuri bin Haji Ahmad SA 54

**Apocynaceae**

- C *Alstonia angustiloba* Miq.; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3011  
 A *Catharanthus roseus* (L.) G.Don; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3079  
 R *Cerbera* sp.; I.M. Turner & M.F. Choong SB 1035

**Aquifoliaceae**

- R *Ilex cymosa* Blume; Haji Samsuri bin Haji Ahmad SA.71; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3061

**Araceae**

- S *Caladium bicolor* (Aiton) Vent.; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1064  
 C *Colocasia esculenta* (L.) Schott; M.F. Choong VC 110; M.F. Choong VC 116; M.F. Choong VC 135  
 S *Dieffenbachia seguine* (Jacq.) Schott in Wiener Z. Kunst; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3081  
 A *Pistia stratiotes* L.; K.S. Chua & Y.C. Wee CKS & WYC 572; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3078

**Araliaceae**

- S *Schefflera actinophylla* (Endl.) Harms; I.M. Turner & M.F. Choong SB 1047

**Asclepiadaceae**

- R *Dischidia major* (Vahl) Merr.; Haji Samsuri bin Haji Ahmad SA. 57; I.M. Turner & M.F. Choong SB 1096

- C *Dischidia nummularia* R.Br.; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3050

- V *Finlaysonia obovata* Wall.; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3004; M.F. Choong VC 123; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1055

- R *Hoya verticillata* (Vahl) G.Don var. *verticillata*; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3086

- V *Tylophora flexuosa* R.Br.; Haji Samsuri bin Haji Ahmad SA.30; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1020; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1068

**Avicenniaceae**

- C *Avicennia alba* Blume; K.S. Chua & Y.C. Wee CKS & WYC 532; M.F. Choong VC 84; M.F. Choong PB 7; P.T. Chew, H.A. Hong & J.W.H. Yong SB 1013  
 R *Avicennia officinalis* L.; M.F. Choong PB 1; M.F. Choong VC 77; P.T. Chew, H.A.Kong & J.W.H. Yong SB 1031; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1065  
 R *Avicennia rumphiana* Hallier f.; M.F. Choong VC 115; P.T. Chew, H.A. Kong & J.W.H. Yong SB 14

**Bignoniaceae**

- A *Spathodea campanulata* P.Beauv.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3006  
 S *Tabebuia rosea* (Bertol.) DC.; M.F. Choong VC 43; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1062

**Bombacaceae**

- S *Durio zibethinus* Murray; M.F. Choong VC 2; Haji Samsuri bin Haji Ahmad SA 69

**Boraginaceae**

- A *Carmona retusa* (Vahl) Masam.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3013; I.M. Turner & M.F. Choong SB 1080
- A *Cordia cylindristachya* (Ruiz & Pav.) Roem. & Schult; I.M. Turner & M.F. Choong SB 1081; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3014; M.F. Choong VC 25
- C *Heliotropium indicum* L.; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1050

**Butomaceae**

- A *Limnocharis flava* (L.) Buch.; K.S. Chua & Y.C. Wee CKS & WYC 495

**Caesalpiniaceae**

- R *Caesalpinia crista* L.; M.F. Choong PB 9; M.F. Choong VC 33
- A *Calopogonium mucunoides* Desv.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3037
- R *Intsia bijuga* (Colebr.) Kuntze; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3107
- A *Senna alata* (L.) Roxb.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3080; P.T. Chew, H.A. Kong & J.W.H. Yong SB 10
- A *Senna obtusifolia* (L.) Irwin & Barneby; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3069

**Cannaceae**

- A *Canna indica* L.; Haji Samsuri bin Haji Ahmad SA. 20

**Capparaceae**

- A *Cleome rutidosperma* DC.; K.S. Chua & Y.C. Wee CKS & WYC 523; M.F. Choong VC 3; M.F. Choong VC 54

**Caricaceae**

- S *Carica papaya* L.; M.F. Choong VC 18; M.F. Choong VC 95

**Celastraceae**

- N *Cassine viburnifolia* (Juss.) Ding Hou; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3054

**Combretaceae**

- R *Lumnitzera littorea* (Jack) Voigt; M.F. Choong PB 4; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1014; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1114
- R *Lumnitzera racemosa* Willd.; M.F. Choong VC 81; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3029
- C *Terminalia catappa* L.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3067

**Compositae**

- A *Ageratum conyzoides* L.; I.M. Turner & M.F. Choong SB 1066
- R *Blumea balsamifera* (L.) DC.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3084
- S *Complaya trilobata* (L.) Strother; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3025
- A *Conyza bonariensis* (L.) Cronquist; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3085; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3105
- A *Crassocephalum crepidioides* (Benth.) S. Moore; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3065
- C *Eclipta prostrata* (L.) L.; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1008
- A *Erechthites hieraciifolia* (L.) Raf. ex DC.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3016

- R *Gynura procumbens* (Lour.) Merr.; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1058
- A *Mikania micrantha* Kunth; I.M. Turner & M.F. Choong SB 1092; M.F. Choong VC 7; M.F. Choong VC 10; M.F. Choong VC 15; M.F. Choong VC 58
- R *Pluchea indica* (L.) Less.; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1019; I.M. Turner & M.F. Choong SB 1083
- A *Porophyllum ruderale* (Jacq.) Cass.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3044
- A *Synedrella nodiflora* (L.) Gaertn.; K.S. Chua & Y.C. Wee CKS & WYC 490
- C *Vernonia cinerea* (L.) Less.; I.M. Turner & M.F. Choong SB 1088
- S *Vernonia elliptica* DC.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3087
- C *Wollastonia biflora* (L.) DC.; Haji Samsuri bin Haji Ahmad SA. 37; K.S. Chua & Y.C. Wee CKS & WYC 578; M.F. Choong VC 22; M.F. Choong VC 57

### Convolvulaceae

- C *Ipomoea aquatica* Forsk.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3031
- S *Ipomoea batatas* (L.) Lam.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3071; M.F. Choong VC 127; M.F. Choong VC 130
- S *Ipomoea digitata* L.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3026
- C *Ipomoea pes-caprae* (L.) R.Br. ssp *brasiliensis* (L.) Ooststr.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3042
- S *Ipomoea quamoclit* L.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3036
- S *Ipomoea triloba* L.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner &

J.W.H. Yong SB 3028; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1042

- R *Merremia hederacea* (Burm.f.) Hallier f. forma *barbata* Ooststr.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3027
- C *Xenostegia tridentata* (L.) D.F. Austin & Staples ssp. *tridentata*; I.M. Turner & M.F. Choong SB 1052

### Cucurbitaceae

- S *Coccinia grandis* (L.) Voight; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3072; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3073; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3074

### Cyperaceae

- R *Cyperus compactus* Retz.; M.F. Choong SB 0001
- C *Cyperus distans* L.f.; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1049
- C *Cyperus javanicus* Houtt.; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1028; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1070; K.S. Chua & Y.C. Wee CKS & WYC 478
- R *Cyperus rotundus* L.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3093; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3094; K.S. Chua & Y.C. Wee CKS & WYC 534
- R *Eleocharis ochrostachys* Steud.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3048
- C *Fimbristylis acuminata* Vahl; K.S. Chua & Y.C. Wee CKS & WYC 494
- R *Fimbristylis cymosa* R.Br.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3095
- R *Fimbristylis ferruginea* (L.) Vahl; I.M. Turner & M.F. Choong SB 1074
- C *Fimbristylis littoralis* Gaudich.; I.M.

- Turner & M.F. Choong SB 1039  
 A *Kyllinga polyphylla* Willd. ex Kunth; K.S. Chua & Y.C. Wee CKS & WYC 485  
 R *Schoenoplectus mucronatus* (L.) Palla; K.S. Chua & Y.C. Wee CKS & WYC 480  
 C *Scleria levis* Retz.; K.S. Chua & Y.C. Wee CKS & WYC 514; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3106

### Dilleniaceae

- C *Dillenia suffruticosa* (Griff.) Mart.; K.S. Chua & Y.C. Wee CKS & WYC 526; Haji Samsuri bin Haji Ahmad SA.7; M.F. Choong VC 113

### Elaeocarpaceae

- A *Muntingia calabura* L.; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3068

### Euphorbiaceae

- C *Breynia reclinata* (Roxb.) Hook.f.; Haji Samsuri bin Haji Ahmad SA. 21; I.M. Turner & M.F. Choong SB 1077; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1032  
 A *Euphorbia hirta* L.; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3075  
 R *Excoecaria agallocha* L.; Haji Samsuri bin Haji Ahmad SA.14; Haji Samsuri bin Haji Ahmad SA.53; I.M. Turner & M.F. Choong SB 1071; P.T. Chew, H.A. Hong & J.W.H. Yong SB 1061; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1017  
 C *Mallotus paniculatus* (Lam.) M.A.; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3001  
 S *Manihot esculenta* Crantz; I.M. Turner & M.F. Choong SB 1044; M.F. Choong VC 13  
 A *Manihot glaziovii* M.A.; K.S. Chua & Y.C. Wee CKS & WYC 492/A

- C *Phyllanthus debilis* Klein ex Willd.; K.S. Chua & Y.C. Wee CKS & WYC 497; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3111; M.F. Choong VC 98; P.T. Chew, H.A. Hong & J.W.H. Yong SB 1007; P.T. Chew, H.A. Hong & J.W.H. Yong SB 1023

- C *Phyllanthus urinaria* L.; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3052

- A *Ricinus communis* L.; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3012

- C *Sapium discolor* (Champ. ex Benth.) M.A.; M.F. Choong VC 36

- C *Sebastiania chamalaea* (L.) M.A.; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3017

### Flagellariaceae

- R *Flagellaria indica* L.; Haji Samsuri bin Haji Ahmad SA.16; Haji Samsuri bin Haji Ahmad SA. 59; I.M. Turner & M.F. Choong SB 1101; K.S. Chua & Y.C. Wee CKS & WYC 484; M.F. Choong VC 121; M.F. Choong VC 133

### Gramineae

- A *Axonopus compressus* (Sw.) P.Beauv.; I.M. Turner & M.F. Choong SB 1078  
 S *Bambusa vulgaris* Schrad. ex Wendl.; M.F. Choong VC 131; M.F. Choong VC 21  
 A *Chloris barbata* Swartz; I.M. Turner & M.F. Choong SB 1075; M.F. Choong VC 101  
 C *Cynodon dactylon* (L.) Pers.; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3023  
 C *Dactyloctenium aegyptium* (L.) Willd.; K.S. Chua, M. Mathews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3024  
 C *Digitaria ciliaris* (Retz.) Koeler; K.S. Chua & Y.C. Wee CKS & WYC 482;

- R *Digitaria longiflora* (Retz.) Pers.; I.M. Turner & M.F. Choong SB 1107
- C *Echinochloa colona* (L.) Link; K.S. Chua & Y.C. Wee CKS & WYC 479; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3091
- C *Eleusine indica* (L.) Gaertn.; K.S. Chua & Y.C. Wee CKS & WYC 527; M.F. Choong VC 132
- C *Eriochloa procera* (Retz.) C.E.Hubb.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3022; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1054; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1054
- C *Imperata cylindrica* (L.) P.Beauv.; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1070; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3041; M.F. Choong VC 96
- C *Ischaemum magnum* Rendle; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3019
- C *Ischaemum muticum* L.; K.S. Chua & Y.C. Wee CKS & WYC 475; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3090
- C *Leptochloa chinensis* (L.) Nees; K.S. Chua & Y.C. Wee CKS & WYC 474
- A *Melinis repens* (Willd.) Zizka; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3018
- C *Mnesithea glandulosa* (Trin.) Koning & Sosaf; I.M. Turner & M.F. Choong SB 1069
- C *Ottochloa nodosa* (Kunth) Dandy; K.S. Chua & Y.C. Wee CKS & WYC 481
- A *Panicum maximum* Jacq.; I.M. Turner & M.F. Choong SB 1099; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3056; M.F. Choong VC 100; M.F. Choong VC 134
- A *Paspalum conjugatum* Berg.; I.M. Turner & M.F. Choong SB 1076; K.S. Chua & Y.C. Wee CKS & WYC 529; M.F. Choong VC 52
- C *Paspalum vaginatum* Sw.; I.M. Turner & M.F. Choong SB 1036; M.F. Choong VC 40
- A *Pennisetum polystachyon* (L.) Schult.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3020
- S *Saccharum officinarum* L.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3108
- C *Sporobolus indicus* (L.) R.Br. var. *flaccidus* (Roem. & Schult.) Veldkamp; Haji Samsuri bin Haji Ahmad SA. 11; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3092
- C *Sporobolus indicus* (L.) R.Br. var. *major* (Büse) Baaijens; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3021
- A *Urochloa mutica* (Forsk.) T.-Q.Nguyen; I.M. Turner & M.F. Choong SB 1098

### Guttiferae

- R *Calophyllum inophyllum* L.; K.S. Chua & Y.C. Wee CKS & WYC 507

### Labiatae

- A *Hyptis brevipes* Poit.; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1067
- A *Hyptis capitata* Jacq.; K.S. Chua & Y.C. Wee CKS & WYC 511; M.F. Choong VC 6; M.F. Choong VC 14
- R *Ocimum tenuiflorum* L.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3055

### Lauraceae

- C *Cinnamomum iners* Reinw. ex Blume; M.F. Choong VC 1

### Lecythidaceae

- R *Barringtonia asiatica* (L.) Kurz; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3088

**Lemnaceae**

- C *Lemna perpusilla* Torrey; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3115

**Liliaceae**

- S *Cordyline terminalis* Kunth; I.M. Turner & M.F. Choong SB 1043

**Loganiaceae**

- C *Fagraea fragrans* Roxb.; I.M. Turner & M.F. Choong SB 1091; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3002

**Loranthaceae**

- C *Dendrophthoe pentandra* (L.) Miq.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3082  
 C *Macrosolen cochinchinensis* (Lour.) Tiegh.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3010

**Lythraceae**

- S *Cuphea hyssopifolia* Humb., Bonpl. & Kunth; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3101  
 C *Sonneratia alba* J.J. Smith; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1048

**Malpighiaceae**

- V *Tristellateia australasiae* A.Rich.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3083

**Malvaceae**

- R *Abutilon indicum* (L.) Sweet; P.T. Chew, H.A. Hong & J.W.H. Yong SB 1024  
 C *Hibiscus tiliaceus* L.; M.F. Choong VC 38; M.F. Choong VC 50; M.F. Choong VC 82  
 C *Sida acuta* Burm.f.; Haji Samsuri bin Haji Ahmad SA.31; M.F. Choong VC 20; M.F.

Choong VC 39; P.T. Chew, H.A. Hong & J.W.H. Yong SB 15; P.T. Chew, H.A. Hong & J.W.H. Yong SB 1063

- C *Sida rhombifolia* L.; M.F. Choong VC 31; P.T. Chew, H.A. Kong & J.W.H. Yong SB 15; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1015; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1063

- R *Thespesia populnea* (L.) Soland. ex Correa; I.M. Turner & M.F. Choong SB 1079; M.F. Choong VC 46; P.T. Chew, H.A. Hong & J.W.H. Yong SB 1011

- C *Urena lobata* L.; Haji Samsuri bin Haji Ahmad SA.36; K.S. Chua & Y.C. Wee 476; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3045; P.T. Chew, H.A. Hong & J.W.H. Yong SB 1018

**Melastomataceae**

- A *Clidemia hirta* (L.) D.Don; I.M. Turner & M.F. Choong SB 1046; M.F. Choong VC 9  
 C *Melastoma malabathricum* L.; K.S. Chua & Y.C. Wee CKS & WYC 517; M.F. Choong VC 19

**Meliaceae**

- S *Melia azedarach* L.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3099  
 R *Xylocarpus granatum* J.König; K.S. Chua & Y.C. Wee CKS & WYC 502; M.F. Choong PB. 8; M.F. Choong VC 75; M.F. Choong VC 87

**Mimosaceae**

- A *Acacia auriculiformis* A.Cunn. ex Benth.; Haji Samsuri bin Haji Ahmad SA.50; K.S. Chua & Y.C. Wee CKS & WYC 489; M.F. Choong VC 68  
 A *Acacia mangium* Willd.; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1057  
 A *Adenanthera pavonina* L.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3100

R *Entada spiralis* Ridl.; K.S. Chua & Y.C. Wee CKS & WYC 531

A *Mimosa diplotricha* C.Wright ex Sauvage; M.F. Choong VC 5; M.F. Choong VC 111

A *Mimosa pigra* L.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3047

A *Mimosa pudica* L.; I.M. Turner & M.F. Choong SB 1100; M.F. Choong VC 66

A *Neptunia plena* (L.) Benth.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3035; M.F. Choong VC 26

A *Paraserianthes falcataria* (L.) Nielsen; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3053

### **Moraceae**

S *Artocarpus heterophyllus* Lam.; K.S. Chua & Y.C. Wee CKS & WYC 528

S *Artocarpus integer* (Thunb.) Merr.; M.F. Choong VC 8

R *Ficus apiocarpa* Miq.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3103

C *Ficus benjamina* L.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3005

C *Ficus fistulosa* Reinw. ex Blume; I.M. Turner & M.F. Choong SB 1041

C *Ficus grossularioides* Burm.f.; P.T. Chew, H.A. Hong & J.W.H. Yong SB 11

C *Ficus microcarpa* L.f.; M.F. Choong VC 108

### **Myricaceae**

C *Myrica esculenta* Buch.-Ham.; I.M. Turner M.F. Choong SB 1034

### **Myrtaceae**

S *Eugenia aquea* Burm.f.; Haji Samsuri bin Haji Ahmad SA 55

R *Eugenia polyantha* Wight; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3098

V *Eugenia rugosa* (Korth.) Merr.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3104

C *Eugenia spicata* Lam.; Haji Samsuri bin Haji Ahmad SA 58; K.S. Chua & Y.C. Wee CKS & WYC 509; P.T. Chew, H.A. Hong & J.W.H. Yong SB 1010

S *Psidium guajava* L.; M.F. Choong VC 16

### **Nepenthaceae**

C *Nepenthes gracilis* Korth.; K.S. Chua & Y.C. Wee CKS & WYC 496

### **Onagraceae**

C *Ludwigia hyssopifolia* (G.Don) Exell; K.S. Chua & Y.C. Wee CKS & WYC 492; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1026a

### **Opiliaceae**

C *Champereia manillana* (Blume) Merr.; M.F. Choong VC 73

### **Orchidaceae**

C *Eulophia graminea* Lindl.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3057

### **Palmae**

V *Calamus erinaceus* (Becc.) Dransf.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3089

A *Cocos nucifera* L.; M.F. Choong VC 136

R *Nypa fruticans* Wurmb; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3008

### **Pandanaceae**

S *Pandanus amaryllifolius* Roxb.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3076

C *Pandanus odoratissimus* L.f.; K.S. Chua & Y.C. Wee CKS & WYC 500

### Papilionaceae

- A *Aeschynomene americana* L.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3015
- R *Aeschynomene indica* L.; I.M. Turner & M.F. Choong SB 1038
- R *Alysicarpus vaginalis* (L.) DC.; M.F. Choong VC 28
- A *Calopogonium mucunoides* Desv.; M.F. Choong VC 17; M.F. Choong VC 102
- A *Centrosema pubescens* Benth.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3034; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3062
- A *Clitoria ternatea* L.; M.F. Choong VC 34
- A *Crotalaria pallida* Aiton; K.S. Chua & Y.C. Wee CKS & WYC 524
- R *Dalbergia candenatensis* (Dennst.) Prain; K.S. Chua & Y.C. Wee CKS & WYC 508; M.F. Choong VC 122; P.T. Chew, H.A. Kong & J.W.H. Yong S.Buloh 17; P.T. Chew, H.A. Kong & J.W.H. Yong SB 17
- C *Derris trifoliata* Lour.; Haji Samsuri bin Haji Ahmad SA.15; K.S. Chua & Y.C. Wee CKS & WYC 486; M.F. Choong VC 62; M.F. Choong VC 119; P.T. Chew, H.A. Hong & J.W.H. Yong SB 12; P.T. Chew, H.A. Hong & J.W.H. Yong SB 1004
- C *Desmodium heterophyllum* (Willd.) DC.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3110; M.F. Choong VC 140
- C *Desmodium triflorum* (L.) DC.; M.F. Choong VC 53; M.F. Choong VC 89
- S *Erythrina variegata* L.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3009
- A *Indigofera hirsuta* L.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3033; P.T. Chew, H.A. Hong & J.W.H. Yong SB 18
- A *Macroptilium lathyroides* (L.) Urb.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3063

- A *Sesbania cannabina* (Retz.) Poir.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3032; I.M. Turner & M.F. Choong SB 1103

- A *Tephrosia noctiflora* Bojer ex Baker; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3046

### Passifloraceae

- A *Passiflora foetida* L.; Haji Samsuri bin Haji Ahmad SA.39; K.S. Chua & Y.C. Wee CKS & WYC 522; M.F. Choong VC 47

### Polygaceae

- A *Polygala paniculata* L.; M.F. Choong VC 56

### Pontederiaceae

- A *Eichhornia crassipes* (Mart.) Solms; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3096

### Rhizophoraceae

- R *Bruguiera cylindrica* (L.) Blume; Haji Samsuri bin Haji Ahmad SA.23; Haji Samsuri bin Haji Ahmad SA.52; K.S. Chua & Y.C. Wee CKS & WYC 535; M.F. Choong VC 30; P.T. Chew, H.A. Hong & J.W.H. Yong SB 1012

- R *Bruguiera gymnorhiza* (L.) Say.; M.F. Choong PB 2; M.F. Choong VC 125; P.T. Chew, H.A. Hong & J.W.H. Yong SB 1059

- R *Ceriops tagal* (Pers.) C.B.Rob.; I.M. Turner & M.F. Choong SB 1072; M.F. Choong VC 74; M.F. Choong VC 114

- R *Rhizophora apiculata* Blume; K.S. Chua & Y.C. Wee CKS & WYC 499; M.F. Choong PB 11; M.F. Choong VC 86; M.F. Choong VC 129

- R *Rhizophora mucronata* Lam.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3007; M.F. Choong PB 10

- Rhizophora* sp.; M.F. Choong VC 80

**Rubiaceae**

- C *Gynochthodes sublanceolata* Miq.; Haji Samsuri bin Haji Ahmad SA. 62; I.M. Turner & M.F. Choong SB 1082; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1002
- R *Hedyotis dichotoma* Koen. ex Roth; I.M. Turner & M.F. Choong SB 1105
- A *Morinda citrifolia* L.; Haji Samsuri bin Haji Ahmad SA. 63; I.M. Turner & M.F. Choong SB 1094; K.S. Chua & Y.C. Wee CKS & WYC 537
- R *Oxyceros longiflora* (Lam.) Yamazaki; Haji Samsuri bin Haji Ahmad SA. 12
- C *Paederia foetida* L.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3112; M.F. Choong VC 44; M.F. Choong VC 48; M.F. Choong VC 49; M.F. Choong VC 59; M.F. Choong VC 63; M.F. Choong VC 69; M.F. Choong VC 70; M.F. Choong VC 72; M.F. Choong VC 83; M.F. Choong VC 92; M.F. Choong VC 128
- R *Psydrax* sp. 10 of Tree Flora of Malaya V.4; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1009
- R *Scyphiphora hydrophyllacea* Gaertn.f.; M.F. Choong VC 78
- R *Timonius flavesens* (Jack) Baker; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1009
- R *Uncaria lanosa* Wall. var. *glabrata* (Blume) Ridsdale; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3059

**Rutaceae**

- R *Melicope lunu-ankenda* (Gaertn.) T.G. Hartley; K.S. Chua & Y.C. Wee 525; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3049
- S *Murraya koenigii* (L.) Spreng.; I.M. Turner & M.F. Choong SB 1109

**Sapindaceae**

- R *Allophylus cobbe* (L.) Raeusch.; K.S.

Chua & Y.C. Wee 491; M.F. Choong VC 24; P.T. Chew, H.A. Hong & J.W.H. Yong SB 1005

**Sapotaceae**

- R *Pouteria obovata* (R.Br.) Baehni; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1031

**Scrophulariaceae**

- A *Scoparia dulcis* L.; K.S. Chua & Y.C. Wee CKS & WYC 521; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3077

**Solanaceae**

- C *Physalis minima* L.; I.M. Turner & M.F. Choong SB 1027; K.S. Chua & Y.C. Wee 501; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3043; M.F. Choong PB. 12; P.T. Chew, H.A. Hong & J.W.H. Yong SB 1027; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1030; SB 1024

- A *Solanum nigrum* L.; Haji Samsuri bin Haji Ahmad SA. 18; K.S. Chua & Y.C. Wee CKS & WYC 493; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1026

- A *Solanum torvum* Sw.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3064

**Sonneratiaceae**

- C *Sonneratia alba* J.J. Smith; M.F. Choong PB 5; M.F. Choong PB 6; M.F. Choong VC 76

**Tiliaceae**

- C *Triumfetta tomentosa* Bojer; I.M. Turner 93-102

**Typhaceae**

- A *Typha angustifolia* L.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3070

**Ulmaceae**

- C *Trema cannabina* Lour.; K.S. Chua & Y.C Wee 579; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1029
- C *Trema tomentosa* (Roxb.) Hara; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3051

**Umbelliferae**

- C *Centella asiatica* (L.) Urb.; I.M. Turner & M.F. Choong SB 1089

**Verbenaceae**

- R *Clerodendron inerme* (L.) Gaertn.; Haji Samsuri bin Haji Ahmad SA. 47; M.F. Choong VC 107; M.F. Choong VC 117; P.T. Chew, H.A. Kong & J.W.H. Yong SB 1001
- A *Lantana camara* L.; I.M. Turner & M.F. Choong SB 1073; M.F. Choong VC 11; M.F. Choong VC 23
- R *Phyla nodiflora* (L.) Greene; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3040

- R *Premna foetida* Reinw. ex Blume; M.F. Choong VC 35; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3066

- C *Stachytarpheta indica* (L.) Vahl; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3039; M.F. Choong VC 51

- A *Stachytarpheta jamaicensis* (L.) Vahl; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3038

- C *Vitex pinnata* L.; K.S. Chua, M. Matthews, H.T.W. Tan, I.M. Turner & J.W.H. Yong SB 3003

**Vitaceae**

- R *Cayratia mollissima* (Wall.) Gagnep.; M.F. Choong VC 37; M.F. Choong VC 42

- C *Cissus hastata* (Miq.) Planch.; I.M. Turner & M.F. Choong SB 1084

**Appendix 2. Historical collections from the Sungei Buloh area.** Conservation status: C = common; N = endangered; R = rare; V = vulnerable; X = extinct; ? = information on herbarium sheet label could not be read.

**PTERIDOPHYTA****Aspleniaceae**

- X *Asplenium macrophyllum* Sw.; J.S. Goodenough s.n. [1890]

**Hymenophyllaceae**

- N *Cephalomanes obscurum* (Blume) K.Iwatsuki; J.S. Goodenough s.n. [30 Nov 1889]

**Dennstaedtiaceae**

- X *Lindsaea borneensis* Hook.f. ex Baker; J.S. Goodenough & H.N. Ridley s.n. [9 Jan 1889]
- X *Lindsaea parasitica* (Roxb. ex Griff.) Hieron.; J.S. Goodenough s.n. [30 Nov 1889]

**Lycopodiaceae**

- C *Lycopodiella cernua* (L.) Pic.Serm.; J.S. Goodenough s.n. [30 Nov 1889]

**Polypodiaceae**

- V *Microsorum punctatum* (L.) Copel.; J.S. Goodenough s.n. [30 Nov 1889]

**Schizaeaceae**

- C *Lygodium microphyllum* (Cav.) R.Br.; J.S.Goodenough s.n. [30 Nov 1889]  
 C *Schizaea digitata* (L.) Sw.; J.S.Goodenough s.n. [30 Nov 1889]

**MAGNOLIOPHYTA****Acanthaceae**

- R *Staurogyne griffithiana* (Nees) Kuntze; H.N.Ridley s.n. [1894]

**Alangiaceae**

- R *Alangium griffithii* (C.B.Clarke) Harms; H.N.Ridley s.n. [1894]

**Annonaceae**

- R *Desmos dasymachalus* (Blume) Safford; H.N.Ridley 6228 [1894]  
 R *Goniothalamus ridleyi* King; H.N.Ridley 6227 [1893]

**Aquifoliaceae**

- R *Ilex cymosa* Blume; H.N.Ridley 5089 [1893]

**Asclepiadaceae**

- V *Dischidia benghalensis* Colebr.; H.N.Ridley s.n. 9 Jan [1890]; H.N.Ridley 2729 [without date]  
 R *Hoya verticillata* (Vahl) G. Don var. *verticillata*; H.N.Ridley s.n. [18??]

**Commelinaceae**

- R *Amischotolype gracilis* (Ridl.) I.M. Turner; H.N.Ridley s.n. [Oct 1899]

**Connaraceae**

- R *Rourea fulgens* Planch.; J.S. Goodenough 2027a [30 Nov 1889]

**Euphorbiaceae**

- R *Excoecaria agallocha* L.; H.N.Ridley 4425 [1892]

**Flacourtiaceae**

- V *Ryparosa hullettii* King; Mat s.n. [April 1894]

**Gesneriaceae**

- V *Cyrtandra pendula* Blume; H.N.Ridley s.n. [1894]

**Guttiferae**

- N *Garcinia hombroniana* Pierre; Unknown collector 6197 [without date]  
 R *Cratoxylum cochinchinense* (Lour.) Blume; H.N.Ridley 6389 [189?]

**Leguminosae**

- R *Archidendron contortum* (Mart.) I.C.Nielsen; H.N.Ridley 346? [1889]

**Marantaceae**

- R *Stachyphrynum griffithii* (Baker) K.Schum.; H.N.Ridley s.n. [1894]

**Melastomataceae**

- X *Medinilla crassifolia* (Reinw. ex Blume) Blume; H.N.Ridley s.n. [9 Jan 1890]; H.N.Ridley s.n. [9 Jul 1890]; H.N.Ridley s.n. [without date]  
 ? *Medinilla* sp.; H.N.Ridley s.n. [without date]  
 R *Pachycentria maingayi* (C.B.Clarke) J.F.Maxwell; H.N.Ridley 1652 [without date]  
 X *Plethiandra sessiliflora* (Cogn.) Merr.; H.N.Ridley 2021 [9 Jan 1890]

**Menispermaceae**

- R *Fibraurea tinctoria* Lour.; J.S.Goodenough s.n. [1893]

**Myristicaceae**

- V *Myristica cinnamomea* King; H.N.Ridley 6266 [1894]

**Myrsinaceae**

- V *Ardisia tuberculata* Wall. ex A.DC.;

Collector unknown s.n. [4 Aug ?]

### Ochnaceae

- X *Euthemis leucocarpa* Jack; L.C.Corporal 772 [18 Apr 1890]

### Orchidaceae

- X *Apostasia nuda* R.Br.; H.N.Ridley s.n. [Jan 1890]  
 X *Appendicula cornuta* Blume; J.S.Goodenough s.n. [30 Nov 1889]  
 X *Bulbophyllum concinnum* Hook.f.; H.N.Ridley s.n. [9 Jan 1890]; H.N.Ridley s.n. [1891]  
 V *Bulbophyllum membranaceum* Teijsm. & Binn.; H.N.Ridley s.n. [1891]  
 X *Bulbophyllum restrepia* Ridl.; J.S.Goodenough s.n. [1889]  
 V *Claderia viridiflora* Hook.f.; H.N.Ridley s.n. [1890]  
 X *Coelogyne mayeriana* Rchb.f.; J.S.Goodenough s.n. [4 Aug ?]; H.N.Ridley s.n. [1890]  
 X *Cymbidium bicolor* Lindl. ssp. *pubescens* (Lindl.) Du Puy & P.J. Cribb; H.N.Ridley [1891]  
 X *Dendrobium concinnum* Miq.; L.C.Corporal s.n. [18 Apr 1890]  
 X *Dendrobium lobatum* (Blume) Miq.; H.N.Ridley s.n. [1890]  
 X *Dendrobium microglossum* Rchb.f.; J.S.Goodenough s.n. [1890]  
 X *Dendrobium prostratum* Ridl.; H.N.Ridley s.n. [1890]  
 ? *Dendrobium* sp.; H.N.Ridley s.n. [9 Jan 1890]  
 X *Dendrobium spegidoglossum* Rchb.f.; J.S.Goodenough s.n. [30 Nov 1889]  
 X *Dendrobium spurium* (Blume) J.J.Sm.; J.S.Goodenough s.n. [1892]  
 X *Dendrobium villosulum* Lindl.; J.S.Goodenough 369? [29 Jan 1889]  
 X *Eria floribunda* Lindl.; H.N.Ridley 1634 [9 Jan 1890]  
 X *Eria neglecta* Ridl.; H.N.Ridley s.n. [1890]; H.N.Ridley s.n. [1891]

X *Eria nutans* Lindl.; H.N.Ridley s.n. [1890]

X *Eria pannea* Lindl.; J.S.Goodenough s.n. [30 Nov 1889]

X *Eria pulchella* Lindl.; H.N.Ridley s.n. [1890]

X *Eria tenuiflora* Ridl.; J.S.Goodenough s.n. [1892]

X *Flickingeria xantholeuca* (Rchb.f.) A.D.Hawkes; H.N.Ridley s.n. [4 Aug 1890]

X *Galeola nudifolia* Lour.; H.N.Ridley s.n. [9 Jan 1890]

X *Schoenorchis micrantha* Blume; H.N.Ridley 374 [30 Nov 1889]

X *Thelasis carinata* Blume; H.N.Ridley s.n. [9 Jan 1890]

X *Trichotosia velutina* (Lindl.) Lodd. ex Kraenzl.; H.N.Ridley [9 Jan 1890]

### Palmae

- R *Oncosperma tigillarium* (Jack) Ridl.; J.S.Goodenough 1663 [29 Nov 1889]; J.S.Goodenough 3145 [1890]; J.S.Goodenough 3509 [29 Nov 1889]  
 R *Rhopaloblaste singaporense* (Becc.) Hook.f.; H.N.Ridley 2135 [May 1890]

### Pandanaceae

- V *Freyinetia angustifolia* Blume; J.S.Goodenough s.n. [30 Nov 1889]

### Rubiaceae

- N *Diplospora malaccensis* Hook.f.; H.N.Ridley s.n. [1894]  
 R *Gardenia tubifera* Wall. var. *subcarinata* Corner; H.N.Ridley s.n. [1891]  
 C *Gynochthodes sub lanceolata* Miq.; J.S.Goodenough s.n. [4 Aug 1890]  
 R *Hedyotis pinifolia* Wall. ex G.Don; Unknown collector 8925 [1897]  
 R *Oxyceros longiflora* (Lam.) T.Yamaz.; J.S.Goodenough 2415 [16 Sep 1891]  
 R *Prismatomeris glabra* (Korth.) Valeton; H.N.Ridley s.n. [1894]  
 R *Psychotria penangiana* Hook.f.; Corporal 2870 [18 Apr 1890]

- R *Timonius flavescens* (Jack) Baker;  
H.N.Ridley s.n. [without date]  
R *Urophyllum glabrum* Wall.; H.N.Ridley  
s.n. [12 Jan 1890]

**Sterculiaceae**

- R *Pterospermum javanicum* Jungh.;  
H.N.Ridley 6181 [1894]

**Styraceae**

- V *Styrax benzoin* Dryand. var. *benzoin*;  
H.N.Ridley s.n. [1894]

**Vitaceae**

- R *Cayratia mollissima* (Wall.) Gagnep.;  
Corporal s.n. [8 Apr 1890]

**Zingiberaceae**

- R *Hornstedtia leonurus* (J.König) Retz.;  
H.N.Ridley s.n. [1911]  
R *Hornstedtia scyphifera* (J.König) Steud.  
var. *scyphifera*; H.N.Ridley s.n. [1894]