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# SURVEY, EVALUATION AND DOCUMENTATION OF THE CULTIVATED PLANTS IN ASWAN BOTANICAL GARDEN, EGYPT

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## ABSTRACT

The aim of this study was to survey, evaluate and documenting the cultivated perennial plants in Aswan Botanical Garden, Egypt. A total of (361) species belong to (263) genera and (88) families were collected and identified with regional floras and available checklists. The most common families were Leguminosae followed by Palmae, Moraceae and Bignoniaceae. Leguminosae and Palmae were represented by 46 (12.74 %) and 28 (7.75%) species, respectively, while Moraceae and Bignoniaceae were represented by 20 (5.54%) and 17 (4.71%) species, respectively. Sixteen and 14 species were recorded for Myrtaceae and Euphorbiaceae, respectively and 10 species for each Apocynaceae and Labiatae. Moreover, 6 families were represented by 3 species, 11 families by 2 species while 42 families were represented by one species. The trees, shrubs and perennial herbs were represented by 192 (53.19%), 75 (20.78%) and 29 (8.03%) species, respectively. Climber shrubs, fan palms, and feather palms were represented by 27 (7.48%), 15 (4.16%) and 13 (3.61%) species respectively, while succulents, palm-like and woody grasses were represented by 7 (1.93%), 2 (0.55%) and one (0.28%) species, respectively. However, the cultivated annual herbs were not recorded because of the unstable presence of the observed plants. On the whole, Aswan Botanical Garden can serve as a resource of knowledge and guide for the distribution of the cultivated species. Further floristic and ecological studies are needed to conserve this invaluable area.

***Key words** :Aswan, botanical garden, cultivated plants, documentation, evaluation, survey.*

## 1. INTRODUCTION

Botanical gardens are public gardens which maintain collections of live plants mainly for scientific research, conservation and education. Record documentations in botanical gardens can provide opportunities to study the effects of human activities on trees and shrubs (Schreuder and Thomas, 1991). Botanical gardens share a fundamental role in the field of conservation, awareness about environmental crisis and loss of genetic diversity. Thus, botanical gardens have a dual mission of conservation and education. The botanical gardens with their living collections, seed banks, trained specialists and scientists provide a guarantee against the loss of species (Anitha, 2010). In recent years, an increased interest in botanical garden studies has been connected to garden restoration and reconstruction projects (Loeb, 1990 and Moe, *et al.* 2006). Trees and shrubs are absolutely fascinating to study , because of their entire life histories are recorded in their forms. In a sense, the shape of trees and shrubs is analogous to the interaction between genetic endowment and environmental influences (Tredici, 1999).

There is an urgent need to conserve tree species. Around 7,800 tree species are currently recorded as threatened with extinction at the global scale (Oldfield *et al.*, 1998 and Newton and Oldfield, 2008). However, information is lacking on the status and distribution of many suspected rare species of trees and shrubs, so the true figure is likely to be much higher. Trees and shrubs are of exceptional ecological importance, providing habitat for a wide range of other organisms. Many of these trees and shrubs also benefit people, and are associated with social, economic or cultural values. Consequently, their continued decline or loss can have a major impact on human wellbeing (Oldfield and Newton, 2012).

The main roles of Botanical gardens are

summarized as follows: (1) serve as a selected exotic species; (2) serve and preserve the rare and endemic plants; (3) house the germplasm collections of selected economic, ornamental and medicinal plants and their wild progenitors; (4) promote educational programs and research in experimental botany and ornamental horticulture; (5) undertake research in propagation of rare and threatened species and species for energy, food and fodder; (6) generate awareness about the value of trees and shrubs with delightful landscape; (7) organize flower and exchange of viable seed materials; (8) accommodate and study the physiology of species for field trials and cultivation and (9) to act as data bank for information and documentation on holdings in botanical gardens of the country (Heywood, 1983 and Nayar,1990)

Aswan Botanical Garden is the most famous and oldest islands center in the River Nile and was called Natron Garden which relative to the Nuba people. Its name was changed to the island of radar proportion to the headquarters of the commander of the English Lord Kitchener by the British in Egypt during the war in Sudan in the 19th century AD and then changed to the Island of King during the reign of King Fuad I in 1928, and finally launched by the Ministry of Agriculture in the era of the late President Gamal Abdel Nasser, the plants of the Island or the Botanical Garden. It is located in the River Nile surrounded by water from all sides. Aswan Botanical garden is located on an island in the middle of the River Nile and faced to Aswan city. The total area is 17 feddans, and recently 3 feddans were added to reach the length of the park about 650 meters and a maximum width about 115 meters. The park is divided into 27 basins each has a variety of tropical and subtropical perennial plants (Ahmad and Belal, 1990). The main aim of this study was to survey, evaluate and document the cultivated plants in Aswan Botanical Garden, Egypt. However, the cultivated annual herbs were not recorded because of the unstable presence of the observed plants.

## 2. MATERIALS AND METHODS

### 2.1. Study area

#### 2.1.1. Location

Aswan Botanical Garden is located in the River Nile (24° 05' 32" N & 32° 53' 17" E) and surrounded by water from all sides and faced to Aswan city and located on the other side of Elephantine Island (Fig.1). The total area is about 20 feddans divided into 27 basins and cultivated with some plants imported from all over the world

#### 2.1.2. Climate

Aswan is the hottest and driest inhabited city in Egypt . Aswan's climate ranges from mild in the winter to very hot in the summer with absolutely no rain all year. There about 1 or 2 mm of rain every 5 years. The last rain was seven years earlier. In the winter the temperature degrees averaged from 11°C to 25°C. In the summer, the temperature averaged from 25°C to 40°C (Table 1).

#### 2.1.3. Data collection and nomenclature

Field trips were carried out to collect the studied species from Aswan Botanical Garden in Egypt during years 2012-2013. A total of 361 species represented 263 genera and 88 families were collected. The recorded genera were arranged alphabetically within their families (Table 2). Data collections for investigation and identification criteria of the studied taxa were based on the flora and taxonomic references (Bailey; 1947; Täckholm, 1974; Cronquist, 1981; Morin, 1993; Boulos, 1995, 1999, 2000, 2002, 2005 & 2009 and Mabberly, 1997).

The authors collected about 400 specimens from the studied area. The plant collections were prepared as herbarium sheets. Voucher herbarium specimens kept at the herbarium of the Flora and Phytotaxonomy Researches Department (CAIM), Horticultural Research Institute, Agricultural Research Center, Giza, Egypt. For each species plant numbers, herbarium's specimen number and habit were cited.

#### 2.1.4. Statistical analysis

Statistical analysis of the studied species was based on excel program to calculate the following criteria: (1) the number and ratios of species per each family, (2) The number of species and number of individual plants /species for each habit (climber shrub, fan palm, feather palm, palm like, perennial herb, shrub, succulent, woody grass and tree).

## 3. RESULTS AND DISCUSSION

The numbers of cultivated species in Aswan Botanical Garden representing which species have survived and what changes have occurred during the last five decades, provide the basis for examining the long term efficiency and effectiveness of planting and management plans.

The data presented in Table (2) show the recorded cultivated perennial species during

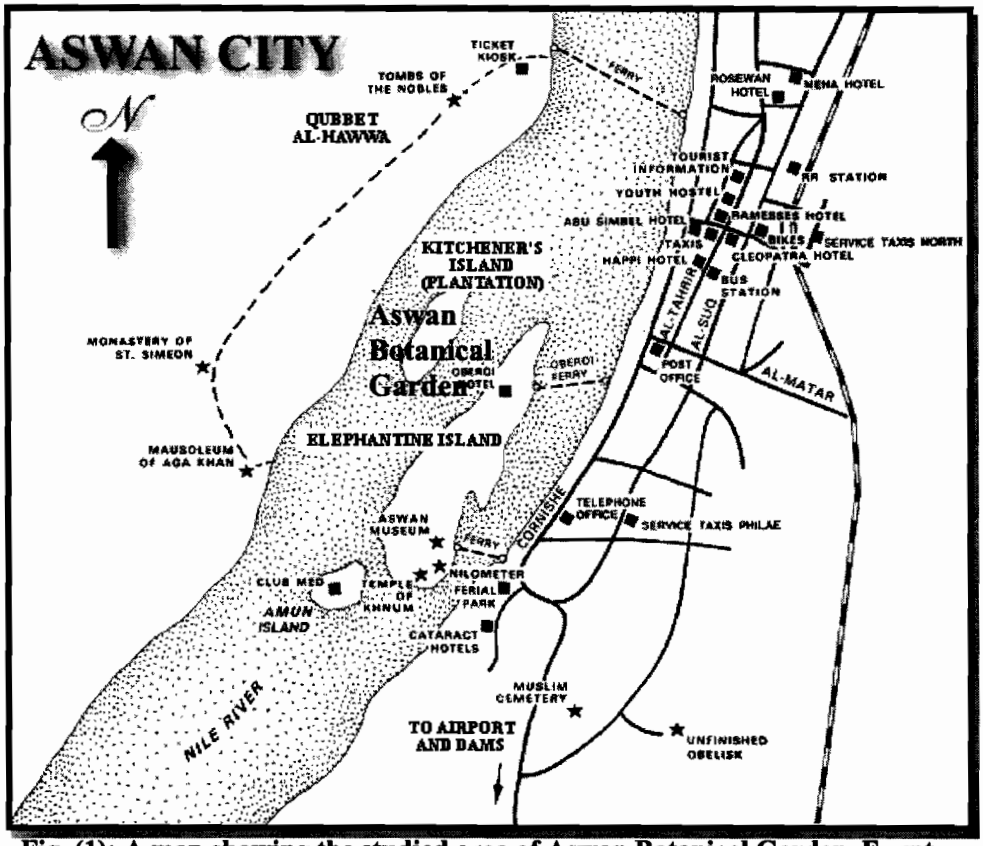


**Fig. (1): A map showing the studied area of Aswan Botanical Garden, Egypt**

**Table (1): Monthly average high and low temperatures (°C) and rainfall (mm) of Aswan region (Based on Egyptian Meteorological Authority, 2012-2013)**

| Months | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average high (°C) | 22.9 | 25.2 | 29.5 | 34.9 | 38.9 | 41.4 | 41.1 | 40.9 | 39.3 | 35.9 | 29.1 | 24.3 | 33.62 |
| Average low (°C) | 8.7 | 10.2 | 13.8 | 18.9 | 23.0 | 25.2 | 26.0 | 25.8 | 24.0 | 20.6 | 15.0 | 10.5 | 18.48 |
| Rainfall (mm) | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.7 | 0.0 | 0.6 | 0.0 | 0.0 | 1.4 |

this study. A total of (361) species belonging to (263) genera, (88) families were identified and 2065 individual plants were recorded. The most common families were Leguminosae followed by Palmae, Moraceae and Bignoniaceae. Leguminosae and Palmae were represented by 46 (12.74 %) and 28 (7.75%) species, respectively, while Moraceae and Bignoniaceae were represented by 20 (5.54%) and 17 (4.71%) species, respectively.

Moreover , 6 families were represented by 3species, 11 families by 2 species while 42 families were represented by one species. The feather-palm species (*Sabal blackburnea*); the tree species (*Ficus microcarpa*) and the climber shrub species (*Bougainvillea glabra*) were represented by 200, 100 and 90 individual plants, respectively. Moreover,84,40 and 25 species were represented by 2,3and4 individual plants, respectively. On the other hand,107 species were represented by one individual plant.

**Table (2): List of the recorded cultivated species in Aswan Botanical Garden arranged within their families, number of plants for each species (PN), herbarium specimen's number (HS) and habit. (* = cultivated only in Aswan Botanical Garden, Egypt).**

| N | Family and Taxa | PN | HS | Habit |
|---|---|---|---|---|
| 1 | ACANTHACEAE | | | |
| 1.1.1 | *Barleria cristata* L. | 2 | 29181 | shrub |
| 1.2.2 | *Eranthemum nigrum* Linden | 15 | 29061 | shrub |
| 1.2.3 | *Eranthemum pulchellum* Andrews | 8 | 29392 | per. herb |
| 1.3.4 | *Justicia adhatoda* L. | 7 | 29229 | shrub |
| 1.4.5 | *Sanchezia speciosa* Leonard | 2 | 29275 | shrub |
| 1.5.6 | *Thunbergia grandiflora* (Roxb. ex Rottler) Roxb. | 3 | 29106 | climber shrub |
| 2 | AGAVACEAE | | | |
| 2.6.7 | *Agave americana* L. | 10 | 29856 | succulent shrub |
| 2.6.8 | *Agave angustifolia* Haw. | 8 | 29857 | succulent shrub |
| 2.7.9 | *Furcraea foetida* (L.) Haw. | 2 | 29892 | succulent shrub |
| 2.8.10 | *Yucca aloifolia* L. | 2 | 29896 | succulent shrub |
| 3 | AMARANTHACEAE | | | |
| 3.9.11 | *Alternanthera bettzickiana* (Regel) G. Nicholson | 2 | 29466 | per. herb |
| 4 | ANACARDIACEAE | | | |
| 4.10.12 | *Anacardium occidentale* L.* | 1 | 29734 | tree |
| 4.11.13 | *Mangifera indica* L. | 10 | 29139 | tree |
| 4.12.14 | *Pistacia terebinthus* L. | 5 | 29431 | tree |
| 4.13.15 | *Pleiogynium timorense* (DC.) Leenh. | 5 | 29117 | tree |
| 4.14.16 | *Spondias cytherea* Sonn. | 3 | 29305 | tree |
| 5 | ANNONACEAE | | | |
| 5.15.17 | *Annona muricata* L. | 1 | 29282 | tree |
| 6 | Anthericaceae | | | |
| 6.16.18 | *Chlorophytum comosum* (Thunb.) Jacques | 2 | 29498 | per. herb |
| 7 | APOCYNACEAE | | | |
| 7.17.19 | *Alstonia scholaris* (L.) R. Br. | 6 | 29333 | tree |
| 7.18.20 | *Carissa carandas* L. | 1 | 29154 | shrub |
| 7.18.21 | *Carissa macrocarpa* (Eckl.) A. DC. | 1 | 29860 | shrub |
| 7.19.22 | *Catharanthus roseus* (L.) G. Don | 7 | 29027 | per. herb |
| 7.20.23 | *Mascarenhasia arborescens* A. DC.* | 2 | 29103 | shrub |
| 7.21.24 | *Nerium oleander* L. | 1 | 29018 | shrub |
| 7.22.25 | *Ochrosia elliptica* Labill. | 3 | 29147 | shrub |
| 7.23.26 | *Plumeria rubra* L. | 20 | 29152 | tree |
| 7.24.27 | *Tabernaemontana divaricata* (L.) R. Br. ex Roem. & Schult. | 5 | 29083 | shrub |
| 7.25.28 | *Thevetia peruviana* (Pers.) K. Schum. L. | 2 | 29118 | tree |
| 8 | ARACEAE | | | |
| 8.26.29 | *Epipremnum aureum* (Linden & André) G. S. Bunting | 1 | 29861 | climber herb |
| 8.27.30 | *Syngonium podophyllum* Schott | 1 | 29862 | per. herb |
| 9 | ARALIACEAE | | | |
| 9.28.31 | *Polyscias guilfoylei* (W. Bull) L. H. Bailey | 2 | 29863 | shrub |
| 9.29.32 | *Schefflera arboricola* (Hayata) Kanehira | 9 | 29439 | shrub |

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|---|---|---|---|---|
| 9.30.33 | *Sciadophyllum pulchrum* Hort. ex Decne. & Planch. | 3 | 29864 | shrub |
| 10 | ARISTOLOCHIACEAE | | | |
| 10.31.34 | *Aristolochia* elegans Mast. | 4 | 29458 | climber shrub |
| 11 | ASCLEPIADACEAE | | | |
| 11.32.35 | *Asclepias curassavica* L. | 5 | 29455 | per. herb |
| 11.33.36 | *Cryptostegia grandiflora* (Roxb.) R. Br. | 1 | 29009 | climber shrub |
| 12 | ASPARAGACEAE | | | |
| 12.34.37 | *Asparagus densiflorus* (Kunth) Jessop | 2 | 29328 | climber shrub |
| 12.34.38 | *Asparagus setaceus* (Kunth) Jessop | 7 | 29210 | climber shrub |
| 12.35.39 | *Ruscus hypoglossum* L. | 5 | 29459 | per. herb |
| 13 | BERBERIDACEAE | | | |
| 13.36.40 | *Nandina domestica* Thunb. | 2 | 29866 | shrub |
| 14 | BIGNONIACEAE | | | |
| 14.37.41 | *Amphilophium paniculatum* (L.) Kunth | 1 | 29867 | climber shrub |
| 14.38.42 | *Campsis radicans* (L.) Seem. ex Bureau | 1 | 29320 | climber shrub |
| 14.39.43 | *Catalpa speciosa* (Warder ex Barney) Engelm.* | 3 | 29409 | tree |
| 14.40.44 | *Crescentia cujete* L.* | 1 | 29709 | tree |
| 14.41.45 | *Dolichandra unguis-cati* (L.) L. G. Lohmann | 5 | 29249 | climber shrub |
| 14.42.46 | *Jacaranda mimosifolia* D. Don | 6 | 29260 | tree |
| 14.43.47 | *Kigelia pinnata* (Jacq.) DC. | 4 | 29166 | tree |
| 14.44.48 | *Markhamia lutea* (Benth.) K. Schum. | 1 | 29089 | tree |
| 14.45.49 | *Podranea ricasoliana* (Tanfani) Sprague | 1 | 29733 | climber shrub |
| 14.46.50 | *Pyrostegia venusta* (Ker-Gawl.) Miers | 2 | 29125 | climber shrub |
| 14.47.51 | *Radermachera ignea* (Kurz) Steenis | 2 | 29178 | tree |
| 14.48.52 | *Spathodea campanulata* P. Beauv. | 20 | 29042 | tree |
| 14.49.53 | *Tabebuia argentea* (Bureau & K. Schum.) Britton | 2 | 29216 | tree |
| 14.49.54 | *Tabebuia pulcherrima* Sandwith | 4 | 29176 | shrub |
| 14.49.55 | *Tabebuia rosea* (Bertol.) DC. | 5 | 29277 | tree |
| 14.50.56 | *Tecoma capensis* (Thunb.) Lindl. | 2 | 29184 | shrub |
| 14.50.57 | *Tecoma stans* (L.) Juss. ex Kunth | 20 | 29088 | shrub |
| 15 | BIXACEAE | | | |
| 15.51.58 | *Bixa orellana* L. | 6 | 29016 | tree |
| 16 | BOMBACACEAE | | | |
| 16.52.59 | *Adansonia digitata* L. | 3 | 29303 | tree |
| 16.53.60 | *Bombax ceiba* L. | 7 | 29223 | tree |
| 16.54.61 | *Ceiba pentandra* (L.) Gaertn. | 2 | 29237 | tree |
| 16.55.62 | *Chorisia speciosa* A. St.-Hil | 9 | 29183 | tree |
| 16.56.63 | *Pachira aquatica* Aubl. | 2 | 29014 | tree |
| 17 | BORAGINACEAE | | | |
| 17.57.64 | *Cordia africana* Lam. | 2 | 29135 | tree |
| 17.57.65 | *Cordia myxa* L. | 9 | 29163 | tree |
| 17.57.66 | *Cordia sinensis* Lam. | 2 | 29309 | tree |
| 17.58.67 | *Ehretia anacua* (Terán & Berland.) I. M. Johnst. | 1 | 29150 | tree |
| 18 | CACTACEAE | | | |

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|---|---|---|---|---|
| 18.59.68 | *Cereus hildmannianus* K. Schum. subsp. *uruguayanus* (R. Kiesling) N. P. Taylor | 1 | 29895 | shrub |
| 18.60.69 | *Opuntia ficus-indica* (L.) Mill. | 15 | 29213 | shrub |
| 19 | CANNACEAE | | | |
| 19.61.70 | *Canna indica* L. | 10 | 29094 | per. herb |
| 20 | CAPPARIDACEAE | | | |
| 20.62.71 | *Capparis zeylanica* L.* | 1 | 29149 | shrub |
| 21 | CAPRIFOLIACEAE | | | |
| 21.63.72 | *Lonicera sempervirens* L. | 1 | 29789 | climber shrub |
| 21.64.73 | *Sambucus nigra* L. | 1 | 29887 | shrub |
| 22 | CARICACEAE | | | |
| 22.65.74 | *Carica papaya* L. | 2 | 29012 | tree |
| 23 | CASUARINACEAE | | | |
| 23.66.75 | *Casuarina equisetifolia* L. | 3 | 29342 | tree |
| 24 | CELASTRACEAE | | | |
| 24.67.76 | *Euonymus japonicus* Thunb. | 10 | 29868 | per. herb |
| 25 | COMBRETACEAE | | | |
| 25.68.77 | *Combretum decandrum* Roxb. | 1 | 29869 | shrub |
| 25.69.78 | *Conocarpus erectus* L. | 2 | 29870 | tree |
| 25.70.79 | *Quisqualis indica* L. | 4 | 29284 | climber shrub |
| 25.71.80 | *Terminalia arjuna* (Roxb. ex DC.) Wight & Arn. | 3 | 29177 | tree |
| 25.71.81 | *Terminalia bellirica* (Gaertn.) Roxb. | 1 | 29369 | tree |
| 25.71.82 | *Terminalia catappa* L. | 8 | 29259 | tree |
| 25.71.83 | *Terminalia myriocarpa* Van Heurck & Müll. Arg. | 1 | 29218 | tree |
| 26 | COMMELINACEAE | | | |
| 26.72.84 | *Tradescantia pallida* (Rose) D. R. Hunt | 5 | 29036 | succulent herb |
| 27 | COMPOSITAE | | | |
| 27.73.85 | *Chrysanthemum morifolium* Ramat. | 5 | 29021 | per. herb |
| 27.74.86 | *Gazania rigens* (L.) Gaertn. | 5 | 29710 | per. herb |
| 27.75.87 | *Gerbera jamesonii* Bolus ex Adlam | 5 | 29073 | per. herb |
| 27.76.88 | *Senecio cineraria* DC. | 2 | 29889 | per. herb |
| 27.77.89 | *Sphagneticola trilobata* (L.) Pruski | 3 | 29493 | per. herb |
| 28 | CONVOLVULACEAE | | | |
| 28.78.90 | *Argyreia nervosa* (Burm. f.) Bojer | 5 | 29077 | climber shrub |
| 28.78.91 | *Argyreia splendens* (Hornemann) Sweet | 1 | 29475 | climber shrub |
| 28.79.92 | *Ipomoea tricolor* Cav. | 2 | 29191 | climber shrub |
| 29 | CUPRESSACEAE | | | |
| 29.80.93 | *Cupressus sempervirens* L. | 1 | 29344 | tree |
| 29.81.94 | *Platycladus orientalis* (L.) Franco | 9 | 29020 | shrub |
| 30 | CYCADACEAE | | | |
| 30.82.95 | *Cycas circinalis* L. | 5 | 29220 | palm-like |
| 30.82.96 | *Cycas revoluta* Thunb. | 16 | 29219 | palm-like |
| 31 | CYPERACEAE | | | |
| 31.83.97 | *Cyperus alternifolius* L. | 2 | 29137 | per. herb |
| 32 | DRACAENACEAE | | | |
| 32.84.98 | *Beaucarnea recurvata* Lem. | 4 | 29373 | tree |
| 32.85.99 | *Cordyline fruticosa* (L.) Goeppert | 30 | 29423 | shrub |

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|---|---|---|---|---|
| 32.86.100 | *Dracaena fragrans* (L.) Ker-Gawl. | 10 | 29890 | shrub |
| 32.86.101 | *Dracaena marginata* Lam. | 10 | 29891 | shrub |
| 32.87.102 | *Sansevieria cylindrica* Bojer ex Hook. | 2 | 29894 | succulent shrub |
| 32.87.103 | *Sansevieria trifasciata* Prain | 4 | 29211 | succulent herb |
| 33 | EBENACEAE | | | |
| 33.88.104 | *Diospyros chloroxylon* Roxb.* | 1 | 29169 | tree |
| 33.88.105 | *Diospyros discolor* Willd.* | 1 | 29151 | tree |
| 33.88.106 | *Diospyros ebenum* J. Koenig* | 3 | 29274 | tree |
| 33.88.107 | *Diospyros malabarica* (Desr.) Kostel | 4 | 29712 | tree |
| 33.88.108 | *Diospyros mespiliformis* Hochst. ex A. DC.* | 2 | 29724 | tree |
| 33.88.109 | *Diospyros montana* Rob.* | 1 | 29704 | tree |
| 33.89.110 | *Euclea pseudebenus* E. Mey. ex A. DC.* | 1 | 29272 | tree |
| 34 | EUPHORBIACEAE | | | |
| 34.90.111 | *Acalypha wilkesiana* Mull. Arg. | 2 | 29025 | shrub |
| 34.91.112 | *Aleurites moluccana* (L.) Willd. | 2 | 29385 | shrub |
| 34.92.113 | *Antidesma bunius* (L.) Spreng. | 4 | 29296 | tree |
| 34.93.114 | *Breynia disticha* J. R. Forst. & G. Forst. | 2 | 29355 | shrub |
| 34.94.115 | *Codiaeum variegatum* (L.) Blume | 10 | 29713 | shrub |
| 34.95.116 | *Euphorbia mauritanica* L. | 1 | 29872 | shrub |
| 34.95.117 | *Euphorbia milii* Des Moul. | 3 | 29071 | per. herb |
| 34.95.118 | *Euphorbia pulcherrima* Willd. ex Klotzsch | 20 | 29023 | shrub |
| 34.95.119 | *Euphorbia royleana* Boiss. | 4 | 29738 | shrub |
| 34.96.120 | *Hura crepitans* L. | 1 | 29268 | tree |
| 34.97.121 | *Jatropha curcas* L. | 4 | 29203 | shrub |
| 34.98.122 | *Phyllanthus emblica* L. | 1 | 29361 | tree |
| 34.99.123 | *Putranjiva roxburghii* Wall. | 3 | 29273 | tree |
| 34.100.124 | *Sapium aucuparium* Jacq. * | 2 | 29270 | tree |
| 35 | FAGACEAE | | | |
| 35.101.125 | *Quercus robur* L. | 1 | 29751 | tree |
| 36 | FLACOURTIACEAE | | | |
| 36.102.126 | *Dovyalis hebecarpa* (Gardner) Warb. | 1 | 29711 | shrub |
| 36.103.127 | *Flacourtia indica* (Burm. f.) Merr. | 1 | 29343 | shrub |
| 36.103.128 | *Flacourtia jangomas* (Lour.) Raeusch. | 1 | 29258 | tree |
| 36.103.129 | *Flacourtia rukam* Zoll. & Moritzi | 3 | 29101 | tree |
| 37 | GUTTIFERAE | | | |
| 37.104.130 | *Calophyllum brasiliense* Cambess. | 1 | 29380 | tree |
| 37.105.131 | *Garcinia dulcis* (Roxb.) Kurz | 2 | 29188 | tree |
| 37.105.132 | *Garcinia livingstonei* T. Anderson | 3 | 29254 | tree |
| 38 | GRAMINEAE | | | |
| 38.106.133 | *Bambusa vulgaris* Schrad. ex J. C. Wendl. | 2 | 29881 | woody grass |
| 39 | HYPOXIDACEAE | | | |
| 39.107.134 | *Curculigo capitulata* (Lour.) Kuntze | 1 | 29721 | per. herb |
| 40 | JUGLANDACEAE | | | |
| 40.108.135 | *Carya illinoinensis* (Wangenh.) K. Koch | 5 | 29474 | tree |
| 41 | LABIATAE | | | |
| 41.109.136 | *Caryopteris incana* (Thunb. ex Houtt.) Miq. | 11 | 29122 | shrub |
| 41.110.137 | *Clerodendrum indicum* (L.) Kuntze | 1 | 29429 | shrub |
| 41.110.138 | *Clerodendrum phlomidis* L. f.* | 2 | 29080 | shrub |
| 41.110.139 | *Clerodendrum speciosissimum* Van Geert. | 10 | 29153 | shrub |
| 41.110.140 | *Clerodendrum splendens* G. Don | 7 | 29084 | climber herb |

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|---|---|---|---|---|
| 41.111.141 | *Ocimum basilicum* L. | 4 | 29190 | shrub |
| 41.112.142 | *Plectranthus scutellarioides* (L.) R. Br. | 2 | 29126 | per. herb |
| 41.113.143 | *Premna odorata* Blanco | 2 | 29718 | tree |
| 41.114.144 | *Tectona grandis* L. f. | 6 | 29715 | tree |
| 41.115.145 | *Vitex agnus-castus* L. | 4 | 29269 | tree |
| 42 | LAURACEAE | | | |
| 42.116.146 | *Cinnamomum camphora* (L.) J. Presl | 3 | 29347 | tree |
| 42.116.147 | *Cinnamomum verum* J. Presl | 1 | 29238 | tree |
| 42.117.148 | *Persea americana* Mill. | 4 | 29233 | tree |
| 43 | LEGUMINOSAE | | | |
| 43.118.149 | *Acacia farnesiana* (L.) Willd. | 1 | 29263 | shrub |
| 43.118.150 | *Acacia modesta* Wallich | 1 | 29379 | tree |
| 43.118.151 | *Acacia nilotica* (L.) Delile subsp. *nilotica* | 19 | 29068 | tree |
| 43.119.152 | *Adenanthera pavonina* L. | 1 | 29877 | tree |
| 43.120.153 | *Albizia lebbeck* (L.) Benth. | 5 | 29313 | tree |
| 43.120.154 | *Albizia lucidior* (Steud.) I. C. Niesen ex H. Hara | 1 | 29192 | tree |
| 43.120.155 | *Albizia procera* (Roxb.) Benth. | 3 | 29358 | tree |
| 43.120.156 | *Albizia saman* (Jacq.) F. Muell. | 1 | 29878 | tree |
| 43.121.157 | *Bauhinia hookeri* F. Muell. | 2 | 29404 | tree |
| 43.121.158 | *Bauhinia retusa* Roxb. | 2 | 29201 | tree |
| 43.121.159 | *Bauhinia variegata* L. | 5 | 29108 | tree |
| 43.122.160 | *Bolusanthus speciosus* (Bolus) Harms | 2 | 29034 | shrub |
| 43.123.161 | *Caesalpinia pulcherrima* (L.) Sw. | 7 | 29043 | shrub |
| 43.123.162 | *Caesalpinia sappan* L. | 2 | 29170 | tree |
| 43.124.163 | *Cassia fistula* L. | 6 | 29267 | tree |
| 43.124.164 | *Cassia javanica* L.* | 4 | 29063 | tree |
| 43.125.165 | *Ceratonia siliqua* L. | 1 | 29141 | tree |
| 43.126.166 | *Dalbergia lanceolaris* L. f. subsp. *paniculata* (Roxb.) Thoth. | 3 | 29196 | tree |
| 43.126.167 | *Dalbergia sissoo* Roxb. ex DC. | 2 | 29171 | tree |
| 43.127.168 | *Delonix regia* (Bojer) Raf. | 10 | 29041 | tree |
| 43.128.169 | *Derris elliptica* (Wall.) Benth. | 4 | 29874 | tree |
| 43.129.170 | *Enterolobium contortisiliquum* (Vell.) Morong. | 3 | 29339 | tree |
| 43.130.171 | *Erythrina variegata* L. | 2 | 29283 | tree |
| 43.131.172 | *Haematoxylum campechianum* L. | 1 | 29349 | tree |
| 43.132.173 | *Hardwickia binata* Roxb.* | 4 | 29041 | tree |
| 43.133.174 | *Hymenaea courbaril* L.* | 1 | 29349 | tree |
| 43.134.175 | *Leucaena leucocephala* (Lam.) de Wit | 5 | 29286 | tree |
| 43.135.176 | *Mimosa pigra* L. | 1 | 29204 | shrub |
| 43.136.177 | *Parkinsonia aculeata* L. | 1 | 29390 | tree |
| 43.137.178 | *Peltophorum dubium* (Spreng.)Taub. * | 1 | 29386 | tree |
| 43.138.179 | *Pithecellobium dulce* (Roxb.) Benth. | 2 | 29494 | tree |
| 43.139.180 | *Pongamia pinnata* (L.) Panigrahi | 1 | 29397 | tree |
| 43.140.181 | *Prosopis farcta* (Banks & Sol.) J. F. Macbr. | 1 | 29730 | shrub |
| 43.141.182 | *Pterocarpus indicus* Willd. | 2 | 29208 | tree |
| 43.142.183 | *Robinia pseudoacacia* L. | 1 | 29875 | tree |
| 43.143.184 | *Saraca indica* L. | 2 | 29168 | tree |
| 43.144.185 | *Schotia brachypetala* Sond. | 3 | 29227 | tree |
| 43.145.186 | *Senna bicapsularis* (L.) Roxb. | 1 | 29858 | tree |
| 43.145.187 | *Senna siamea* (Lam.) H. S. Irwin & Barneby | 2 | 29185 | tree |
| 43.145.188 | *Senna sophera* (L.) Roxb. | 4 | 29356 | shrub |
| 43.145.189 | *Senna spectabilis* (DC.) H. S. Irwin & Barneby | 1 | 29873 | tree |

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|---|---|---|---|---|
| 43.146.190 | *Sophora japonica* L. | 3 | 29723 | tree |
| 43.146.191 | *Sophora secundiflora* (Ortega) Lag. ex DC. | 1 | 29281 | tree |
| 43.147.192 | *Tamarindus indica* L. | 16 | 29388 | tree |
| 43.148.193 | *Tipuana tipu* (Benth.) Kuntze | 1 | 29445 | tree |
| 43.149.194 | *Wisteria sinensis* (Sims) DC. | 2 | 29876 | tree |
| 44 | LECYTHIDACEAE | | | |
| 44.150.195 | *Couroupita guianensis* Aubl. | 1 | 29160 | tree |
| 45 | LYTHRACEAE | | | |
| 45.151.196 | *Lagerstroemia indica* L. | 4 | 29158 | tree |
| 45.152.197 | *Lawsonia inermis* L. | 7 | 29085 | shrub |
| 46 | MAGNOLIACEAE | | | |
| 46.153.198 | *Magnolia grandiflora* L. | 3 | 29453 | tree |
| 47 | MALPIGHIACEAE | | | |
| 47.154.199 | *Malpighia emarginata* DC. | 3 | 29337 | shrub |
| 48 | MALVACEAE | | | |
| 48.155.200 | *Hibiscus rosa-sinensis* L. | 30 | 29189 | shrub |
| 48.155.201 | *Hibiscus schizopetalus* (Dyer) Hook. f. | 3 | 29038 | shrub |
| 48.155.202 | *Hibiscus tiliaceus* L. | 1 | 29346 | tree |
| 48.156.203 | *Malvaviscus arboreus* Cav. | 9 | 29182 | shrub |
| 48.156.204 | *Malvaviscus drumondii* Torr. & A. Gray | 1 | 29893 | shrub |
| 49 | MELIACEAE | | | |
| 49.157.205 | *Aphanamixis polystachya* (Wall.) R. Parker | 6 | 29221 | tree |
| 49.158.206 | *Azadirachta indica* A. Juss. | 8 | 29022 | tree |
| 49.159.207 | *Khaya senegalensis* (Desr.) A. Juss. | 27 | 29193 | tree |
| 49.160.208 | *Swietenia macrophylla* King | 2 | 29370 | tree |
| 49.160.209 | *Swietenia mahagoni* (L.) Jacq. | 12 | 29707 | tree |
| 50 | MORACEAE | | | |
| 50.161.210 | *Artocarpus altilis* (Parkinson) Fosberg | 1 | 29393 | tree |
| 50.162.211 | *Artocarpus heterophyllus* Lam. | 22 | 29008 | tree |
| 50.163.212 | *Ficus altissima* Blume | 7 | 29241 | tree |
| 50.163.213 | *Ficus benjamina* L. | 6 | 29115 | tree |
| 50.163.214 | *Ficus carica* L. | 2 | 29292 | tree |
| 50.163.215 | *Ficus cyathistipula* Warb. | 2 | 29434 | tree |
| 50.163.216 | *Ficus elastica* Rox. ex Hornem | 10 | 29879 | tree |
| 50.163.217 | *Ficus hirta* Vahl.* | 2 | 29299 | tree |
| 50.163.218 | *Ficus hispida* L. f. | 2 | 29293 | tree |
| 50.163.219 | *Ficus lutea* Vahl | 5 | 29079 | tree |
| 50.163.220 | *Ficus lyrata* Warb. | 2 | 29300 | tree |
| 50.163.221 | *Ficus microcarpa* L. f. | 100 | 29172 | tree |
| 50.163.222 | *Ficus platyphylla* Delile | 6 | 29174 | tree |
| 50.163.223 | *Ficus platypoda* (Miq.) A. Cunn. ex Miq. | 2 | 29165 | tree |
| 50.163.224 | *Ficus racemosa* L. | 2 | 29093 | tree |
| 50.163.225 | *Ficus religiosa* L. | 1 | 29312 | tree |
| 50.163.226 | *Ficus spragueana* Mildbr. & Burret | 2 | 29109 | tree |
| 50.163.227 | *Ficus sycomorus* L. | 7 | 29091 | tree |
| 50.164.228 | *Morus alba* L. | 1 | 29148 | tree |
| 50.164.229 | *Morus macroura* Miq. | 3 | 29406 | tree |
| 51 | MORINGACEAE | | | |
| 51.165.230 | *Moringa stenopetala* (Baker f.) Cufod. | 3 | 29240 | tree |
| 52 | MUSACEAE | | | |
| 52.166.231 | *Strelitzia nicolai* Regel & Koern. | 2 | 29401 | shrub |
| 52.166.232 | *Strelitzia reginae* Banks ex Dryander | 3 | 29095 | per. herb |
| 53 | MYRTACEAE | | | |

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|---|---|---|---|---|
| 53.167.233 | *Callistemon viminalis* (Sol. ex Gaertn.) G. Don | 1 | 29074 | tree |
| 53.168.234 | *Corymbia citriodora* (Hook.) K. D. Hill & L. A. S. Johnson | 2 | 29226 | tree |
| 53.169.235 | *Eucalyptus camaldulensis* Dehnh. | 1 | 29449 | tree |
| 53.170.236 | *Eugenia supra-axillaris* Spring ex Mart. | 5 | 29105 | tree |
| 53.170.237 | *Eugenia uniflora* L. | 20 | 29146 | shrub |
| 53.171.238 | *Melaleuca quinquenervia* (Cav.) S. T. Blake | 1 | | tree |
| 53.171.239 | *Melaleuca styphelioides* Sm. | 2 | 29736 | tree |
| 53.172.240 | *Myrciaria edulis* (Vell.) Skeels | 1 | 29722 | shrub |
| 53.173.241 | *Myrtus communis* L. | 1 | 29264 | shrub |
| 53.174.242 | *Pimenta racemosa* (Miller) J. Moore | 2 | 29790 | tree |
| 53.175.243 | *Psidium cattleyanum* Sabine var. *cattleyanum* | 3 | 29266 | shrub |
| 53.175.244 | *Psidium guajava* L. | 10 | 29332 | tree |
| 53.176.245 | *Syzygium aqueum* (Burm. f.) Alston | 1 | 29266 | tree |
| 53.176.246 | *Syzygium cuminii* (L.) Skeels | 30 | 29145 | tree |
| 53.176.247 | *Syzygium grande* (Wight) Walp. | 2 | 29261 | tree |
| 53.176.248 | *Syzygium samarangense* (Blume) Merr. & L. M. Perry | 1 | 29144 | tree |
| 54 | NEPHROLEPIDACEAE | | | |
| 54.177.249 | *Nephrolepis exaltata* (L.) Schott | 1 | 29736 | per. herb |
| 55 | NYCTAGINACEAE | | | |
| 55.178.250 | *Bougainvillea glabra* Choisy | 90 | 29007 | climber shrub |
| 55.178.251 | *Bougainvillea spectabilis* Willd. | 30 | 29029 | climber shrub |
| 55.179.252 | *Mirabilis jalapa* L. | 2 | 29478 | per. herb |
| 56 | OCHNACEAE | | | |
| 56.180.253 | *Ochna integerrima* (Lour.) Merr. | 2 | 29156 | per. herb |
| 57 | OLEACEAE | | | |
| 57.181.254 | *Fraxinus angustifolia* Vahl subsp. *oxycarpa* (M. Bieb. ex Willd.) Franco & Rocha Afonso * | 1 | 29382 | tree |
| 57.182.255 | *Jasminum azoricum* L. | 4 | 29098 | climber shrub |
| 57.182.256 | *Jasminum grandiflorum* L. | 5 | 29452 | climber shrub |
| 57.182.257 | *Jasminum sambac* (L.) Aiton | 40 | 29015 | shrub |
| 57.183.258 | *Nyctanthes arbor-tristis* L. | 1 | 29322 | tree |
| 57.184.259 | *Olea europaea* L. | 1 | 29858 | tree |
| 58 | OXALIDACEAE | | | |
| 58.185.260 | *Averrhoa carambola* L. | 1 | 29321 | tree |
| 59 | PALMAE | | | |
| 59.186.261 | *Areca triandra* Roxb. ex Buch.-Ham. | 1 | 29447 | feather-palm |
| 59.187.262 | *Arenga pinnata* (Wurnb.) Merr. | 55 | 29159 | feather-palm |
| 59.188.263 | *Borassus flabellifer* L. | 7 | 29340 | fan-palm |
| 59.189.264 | *Brahea armata* S.Watson | 2 | 29408 | fan-palm |
| 59.190.265 | *Butia capitata* (Mart.) Becc. | 3 | 29412 | feather-palm |
| 59.191.266 | *Calamus rotang* L. | 1 | 29222 | feather-palm |
| 59.192.267 | *Caryota mitis* L. | 3 | 29113 | feather-palm |
| 59.193.268 | *Chamaerops humilis* Lour. | 5 | 29236 | feather-palm |

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|---|---|---|---|---|
| 59.194.269 | *Cocos nucifera* L.* | 22 | 29207 | feather-palm |
| 59.195.270 | *Dypsis lutescens* (H. Wendl.) Beentje & J. Dransf. | 1 | 29447 | feather-palm |
| 59.196.271 | *Elaeis guineensis* Jacq.* | 3 | 29316 | feather-palm |
| 59.197.272 | *Howea belmoreana* (C. Moore & F. Muell.) Becc. | 9 | 29387 | feather-palm |
| 59.198.273 | *Hyphaene thebaica* L. | 1 | 29323 | feather-palm |
| 59.199.274 | *Latania lontaroides* (Gaertn.) H. E. Moore | 22 | 29469 | fan-palm |
| 59.200.275 | *Licuala spinosa* Thunb.* | 1 | 29473 | fan-palm |
| 59.201.276 | *Livistona australis* (R. Br.) Mart. | 1 | 29435 | fan-palm |
| 59.201.277 | *Livistona carinensis* (Chiov.) Dransf. & Uhl. | 6 | 29416 | fan-palm |
| 59.201.278 | *Livistona chinensis* (Jacq.) R. Br. ex Mart. | 1 | 29430 | fan-palm |
| 59.201.279 | *Livistona decipiens* Becc. | 18 | 29092 | fan-palm |
| 59.201.280 | *Livistona robinsoniana* Becc. | 13 | 29413 | fan-palm |
| 59.202.281 | *Phoenix dactylifera* L. | 3 | 29419 | fan-palm |
| 59.203.282 | *Rhapis excelsa* (Thunb.) A. Henry ex Rehder | 50 | 29225 | feather-palm |
| 59.204.283 | *Roystonea regia* (Kunth) O. F. Cook | 2 | 29297 | fan-palm |
| 59.205.284 | *Sabal blackburnea* Glazebr. | 200 | 29865 | feather-palm |
| 59.205.285 | *Sabal palmetto* (Walter) Lodd. ex Schult. & Schult. f. | 3 | 29341 | fan-palm |
| 59.206.286 | *Thrinax morrisii* H.Wendl. | 3 | 29239 | fan-palm |
| 59.206.287 | *Thrinax parviflora* Sw. | 8 | 29415 | fan-palm |
| 59.207.288 | *Washingtonia robusta* H. Wendl. | 11 | 29471 | fan-palm |
| 60 | PANDANACEAE | | | |
| 60.208.289 | *Pandanus tectorius* Parkinson | 3 | 29859 | tree |
| 61 | PASSIFLORACEAE | | | |
| 61.209.290 | *Passiflora edulis* Sims | 1 | 29888 | climber shrub |
| 62 | PITTOSPORACEAE | | | |
| 62.210.291 | *Pittosporum tobira* (Thunb.) W. T. Aiton | 2 | 29880 | per. herb |
| 63 | PLUMBAGINACEAE | | | |
| 63.211.292 | *Plumbago auriculata* Lam. | 2 | 29198 | per. herb |
| 64 | PODOCARPACEAE | | | |
| 64.212.293 | *Podocarpus macrophyllus* (Thunb.) D. Don | 1 | 29882 | tree |
| 64.212.294 | *Podocarpus neriifolius* D. Don | 3 | 29302 | tree |
| 65 | POLYGONACEAE | | | |
| 65.213.295 | *Antigonon leptopus* Hook. & Arn. | 4 | 29078 | climber shrub |
| 66 | PROTACEAE | | | |
| 66.214.296 | *Grevillea robusta* A. Cunn. ex R. Br. | 2 | 29883 | tree |
| 67 | PUNICACEAE | | | |
| 67.215.297 | *Punica granatum* L. var. *nana* Pers. | 10 | 29062 | shrub |
| 68 | RHAMNACEAE | | | |
| 68.216.298 | *Ziziphus jujuba* Mill. | 2 | 29377 | shrub |
| 68.216.299 | *Ziziphus spina-christi* (L.) Desf. | 3 | 29325 | tree |
| 69 | ROSACEAE | | | |
| 69.217.300 | *Eriobotrya japonica* (Thunb.) Lindl. | 8 | 29133 | tree |
| 69.218.301 | *Prunus armeniaca* Marshall | 2 | 29235 | tree |
| 69.218.302 | *Prunus persica* (L.) Batsch | 1 | 29230 | tree |

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|---|---|---|---|---|
| 69.219.303 | *Rosa banksiae* W. T. Aiton | 1 | 29465 | climber shrub |
| 69.219.304 | *Rosa polyantha* Sieb. & Zucc. | 1 | 29037 | shrub |
| 70 | RUBIACEAE | | | |
| 70.220.305 | *Coffea arabica* L. | 7 | 29376 | shrub |
| 70.221.306 | *Gardenia latifolia* Aiton | 1 | 29202 | tree |
| 70.221.307 | *Gardenia thunbergia* L. f. | 1 | 29186 | tree |
| 70.222.308 | *Hamelia patens* Jacq. | 4 | 29086 | shrub |
| 70.223.309 | *Ixora pavetta* Andrews | 1 | 29375 | tree |
| 70.223.310 | *Ixora undulata* Roxb. | 3 | 29253 | shrub |
| 71 | RUTACEAE | | | |
| 71.224.311 | *Casimiroa edulis* Llave & Lex. | 3 | 29228 | tree |
| 71.225.312 | *Citrus aurantifolia* (Christm.) Swingle | 5 | 29215 | tree |
| 71.225.313 | *Citrus aurantium* L | 6 | 29242 | tree |
| 71.225.314 | *Citrus limetta* Risso | 1 | 29234 | tree |
| 71.225.315 | *Citrus reticulata* Blanco | 3 | 29391 | shrub |
| 71.225.316 | *Citrus sinensis* (L.) Osbeck | 13 | 29157 | tree |
| 71.226.317 | *Glycosmis pentaphylla* (Retz.) Corr. Serr. | 5 | 29187 | shrub |
| 71.227.318 | *Murraya paniculata* (L.) Jack. | 30 | 29116 | shrub |
| 71.228.319 | *Ruta graveolens* L. | 1 | 29732 | per. herb |
| 72 | SALICACEAE | | | |
| 72.229.320 | *Salix subserrata* Willd. | 1 | 29352 | shrub |
| 72.229.321 | *Salix tetrasperma* Roxb. | 4 | 29403 | tree |
| 73 | SAPINDACEAE | | | |
| 73.230.322 | *Alectryon tomentosus* (F. Muell.) Radlk. | 11 | 29044 | tree |
| 73.231.323 | *Dimocarpus longan* Lour. | 2 | 29257 | tree |
| 73.232.324 | *Dodonaea viscosa* Jacq. | 2 | 29123 | shrub |
| 73.233.325 | *Harpullia pendula* Planch. ex F. Muell. | 1 | 29143 | tree |
| 73.234.326 | *Koelreuteria paniculata* Laxm. | 2 | 29884 | tree |
| 74 | SAPOTACEAE | | | |
| 74.235.327 | *Chrysophyllum oliviforme* L. | 4 | 29090 | tree |
| 74.236.328 | *Madhuca longifolia* (L.) J. F. Macbr. | 6 | 29289 | tree |
| 74.237.329 | *Manilkara hexandra* (Roxb.) Dubard | 1 | 29251 | tree |
| 74.237.330 | *Manilkara zapota* (L.) P. Royen | 2 | 29155 | tree |
| 74.238.331 | *Mimusops caffra* E. Mey. ex A. DC. | 1 | 29450 | tree |
| 74.238.332 | *Mimusops elengi* L. | 4 | 29179 | tree |
| 74.239.333 | *Sideroxylon lycioides* L. | 1 | 29164 | tree |
| 75 | SCROPHULARIACEAE | | | |
| 75.240.334 | *Paulownia tomentosa* (Thunb.) Steud. | 5 | 29255 | tree |
| 76 | SIMAROUBACEAE | | | |
| 76.241.335 | *Ailanthus altissima* (Mill.) Swingle | 2 | 29885 | tree |
| 77 | SOLANACEAE | | | |
| 77.242.336 | *Capsicum frutescens* L. | 3 | 29336 | shrub |
| 77.243.337 | *Cestrum diurnum* L. | 5 | 29075 | shrub |
| 77.243.338 | *Cestrum nocturnum* L. | 1 | 29456 | shrub |
| 77.244.339 | *Solanum rantonnetii* Carrière | 1 | 29107 | shrub |
| 78 | STERCULIACEAE | | | |
| 78.245.340 | *Brachychiton populneus* (Schott & Endl.) R. Br. | 1 | 29353 | tree |
| 78.245.341 | *Brachychiton rupestris* (T. Mitch. ex Lindl.) K. Schum. | 11 | 29886 | tree |
| 78.246.342 | *Firmiana simplex* (L.) W. Wight | 1 | 29365 | tree |
| 78.247.343 | *Guazuma ulmifolia* Lam. | 1 | 29161 | tree |
| 78.248.344 | *Pterospermum acerifolium* (L.) Willd. | 2 | 29410 | tree |

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|---|---|---|---|---|
| 78.249.345 | *Pterygota alata* (Roxb.) R. Br. | 2 | 29705 | tree |
| 78.250.346 | *Sterculia foetida* L. | 1 | 29396 | tree |
| 78.250.347 | *Sterculia urens* Roxb.* | 1 | 29362 | tree |
| 79 | STRYCHNACEAE | | | |
| 79.251.348 | *Strychnos nux-vomica* L. | 8 | 29132 | tree |
| 80 | STYRACACEAE | | | |
| 80.252.349 | *Styrax officinalis* L. | 1 | 29245 | shrub |
| 81 | TAMARICACEAE | | | |
| 81.253.350 | *Tamarix nilotica* (Ehrenb.) Bunge | 2 | 29069 | tree |
| 82 | TAXODIACEAE | | | |
| 82.254.351 | *Taxodium distichum* (L.) Rich. | 2 | 29871 | tree |
| 83 | TILIACEAE | | | |
| 83.255.352 | *Grewia asiatica* L. | 2 | 29365 | tree |
| 84 | ULMACEAE | | | |
| 84.256.353 | *Celtis occidentalis* L | 1 | 29728 | tree |
| 85 | VERBENACEAE | | | |
| 85.257.354 | *Citharexylum spinosum* L. | 2 | 29331 | tree |
| 85.258.355 | *Duranta erecta* L. | 2 | 29197 | shrub |
| 85.259.356 | *Lantana camara* L. | 2 | 29031 | shrub |
| 85.259.357 | *Lantana montevidensis* (Spreng.) Briq. | 2 | 29719 | per herb |
| 85.260.358 | *Petrea volubilis* L. | 7 | 29194 | climber shrub |
| 86 | VITACEAE | | | |
| 86.261.359 | *Vitis vinifera* L. | 2 | 29026 | climber shrub |
| 87 | ZINGIBERACEAE | | | |
| 87.262.360 | *Alpinia zerumbet* (Pers.) B. L. Burtt & R. M. Sm. | 4 | 29142 | per. herb |
| 88 | ZYGOPHYLLACEAE | | | |
| 88.263.361 | *Balanites aegyptiaca* (L.) Delile | 1 | 29311 | tree |
| **Total** | | **2065** | | |

On the whole, the trees, shrubs and perennial herbs are represented by 192, 75 and 29 species, respectively. Climber shrubs, fan, and feather palms are represented by 27, 15 and 13 species, respectively. Succulents plants (*Agave americana; Agave angustifolia; Furcraea foetida*; *Sansevieria cylindrica*; *Sansevieria trifasciata; Tradescantia pallida* and *Yucca aloifolia*); palm-like (*Cycas circinalis* and *Cycas revoluta*) woody grasses (*Bambusa vulgaris*) are represented by 7, 2 and one species, respectively.

The data represented in Table (3), show that, 24 species are cultivated only in Aswan Botanical Garden (Ahmad and Belal, 1990 and Khalifa and Loutfy, 2006). Ten tree species are represented by one individual plant e.g. *Anacardium occidentale, Crescentia cujete, Diospyros chloroxylon, Diospyros discolor, Diospyros montana, Euclea pseudebenus, Fraxinus angustifolia* subsp. *oxycarpa, Hymenaea courbaril, Peltophorum dubium* and *Sterculia urens*. The feather-palm species: *Cocos nucifera, Elaeis guineensis* and *Dypsis lutescens* are represented by 22, 3 and one individual plant, respectively. The shrub species: *Clerodendrum phlomidis, Mascarenhasia arborescens* and *Capparis zeylanica* are represented by 2, 2 and one individual plants, respectively. The fan species: *Licuala spinosa* is represented by only one individual plant.

**Table (3): List of species, their plant numbers (PN) and habit which are cultivated only in Aswan Botanical Garden, Egypt.**

| | Species | PN | Habit |
|---|---|---|---|
| 1 | *Anacardium occidentale* L. | 1 | tree |
| 2 | *Capparis zeylanica* L. | 1 | shrub |
| 3 | *Cassia javanica* L. | 4 | tree |
| 4 | *Catalpa speciosa* (Warder) Engelm. | 3 | tree |
| 5 | *Clerodendrum phlomidis* L.f. | 2 | shrub |
| 6 | *Cocos nucifera* L. | 22 | feather-palm |
| 7 | *Crescentia cujete* L. | 1 | tree |
| 8 | *Diospyros chloroxylon* Roxb. | 1 | tree |
| 9 | *Diospyros discolor* Willd. | 1 | tree |
| 10 | *Diospyros ebenum* J.Koenig | 3 | tree |
| 11 | *Diospyros mespiliformis* Hochst.ex A. DC. | 2 | tree |
| 12 | *Diospyros montana* Rob. | 1 | tree |
| 13 | *Dypsis lutescens* (H. Wendl.) Beentje & J. Dransf. | 1 | feather-palm |
| 14 | *Elaeis guineensis* Jacq. | 3 | feather-palm |
| 15 | *Euclea pseudebenus* E.Mey. ex A. DC. | 1 | tree |
| 16 | *Ficus hirta* Vahl. | 2 | tree |
| 17 | *Fraxinus angustifolia*Vahl subsp. *oxycarpa* (M. Bieb. ex Willd.) Franco & Rocha Afonso | 1 | tree |
| 18 | *Hardwickia binata* Roxb. | 4 | tree |
| 19 | *Hymenaea courbaril* L. | 1 | tree |
| 20 | *Licuala spinosa*_Thunb | 1 | fan |
| 21 | *Mascarenhasia arborescens* A. DC. | 2 | shrub |
| 22 | *Peltophorum dubium* (Spreng.)Taub. | 1 | tree |
| 23 | *Sapium aucuparium* Jacq. | 2 | tree |
| 24 | *Sterculia urens* Roxb. | 1 | tree |

The data represented in Fig. (2) show the number of species/habit and the number of individual plant /species for each habit. Trees, shrubs and perennials herbs are represented by (192), (75) & (28) species, and (810), (450) & (98) plant/species, respectively. Similarly, climber shrubs, fan-palms and feather-palms are represented by (27), (16) & (13) species and (194), (103) & (354) plants/species, respectively. On the other hand, number of species/habit and the number of individual plant /species in woody grass, palm-like and succulents are represented by (1), (2) & (7) and (2), (21) and (33), respectively.The data represented in Fig. (3 & 4) show the total numbers and ratios of species / each family. Leguminosae, Palmae, Moraceae, Bignoniaceae and Myrtaceae, are represented by 46 (12.47%), 28 (7.76%), 20 (5.54%), 17 (7.71%) and 16 (4.43%), respectively. Moreover, Euphorbiaceae, Apocynaceae, Labiatae, Rutaceae and Sterculiaceae are represented by 14 (3.88%), 10 (2.77%), 9 (2.49%) and 8 (2.22%), respectively. On the other hand, 78 families are represented by 183 species (50.69%). Generally, Aswan Botanical Garden can serve as a resource of knowledge and guide for the distribution of cultivated species. The intense human disturbance in botanical gardens has causes a decline in the population of the cultivated plants.

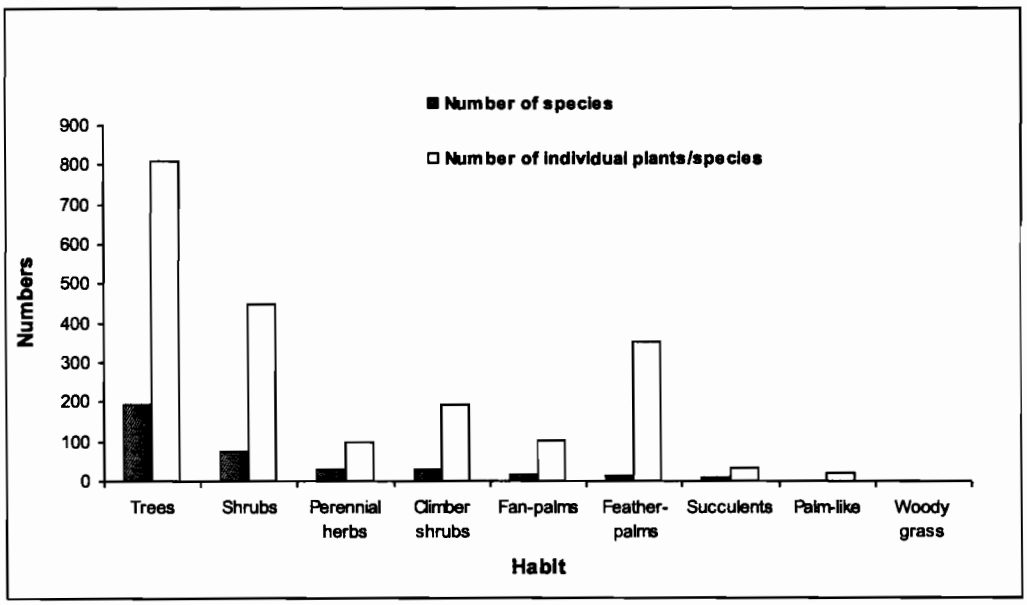


**Fig. (2): Number of species and number of individual plant / species for each habit type in Aswan Botanical Garden.**

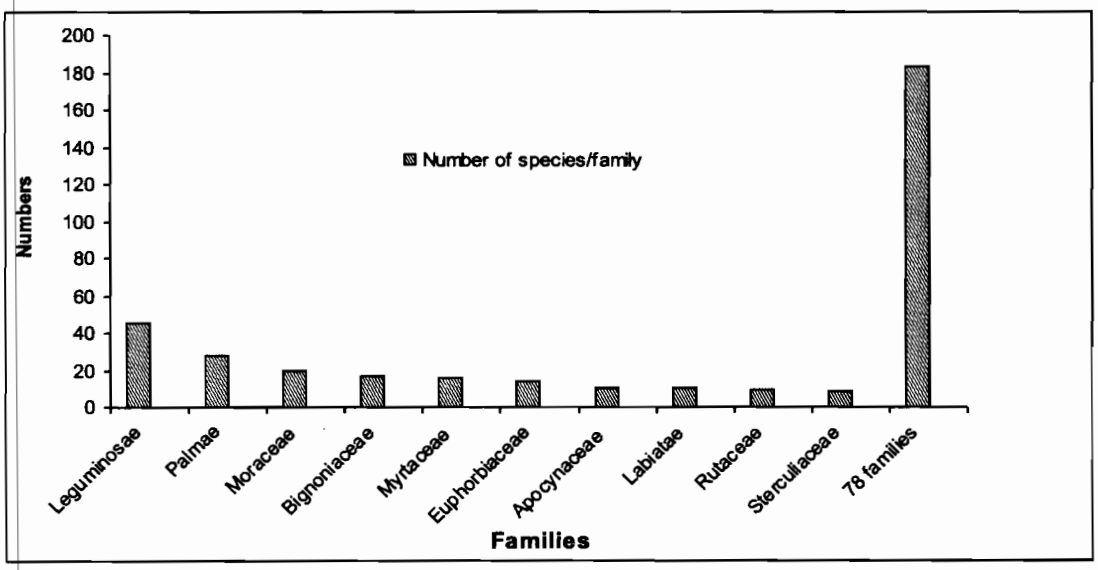


**Fig. (3): Numbers of species / each family in Aswan Botanical Garden.**

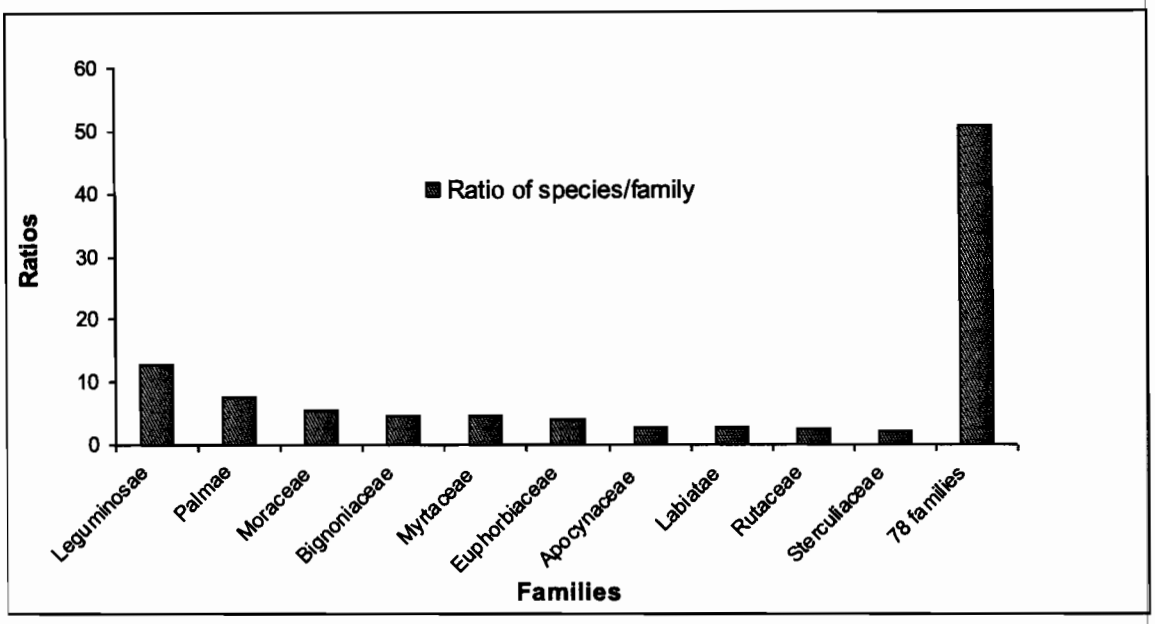


**Fig. (4): Ratios of species / each family in Aswan Botanical Garden.**

**In conclusion**

Ihe present study supports the research into the development of new cultivated species from endemic and naturalized species is considered. Future surveys or plant checklist updates to evaluate alien plant threats and the status of trees and shrubs should include several visits to Aswan Botanical Garden annually. Recent plantings should be added significantly to the number of species in the botanical garden. The connections between plant use and conservation are also important, especially as the authors noted that neither the local inhabitants nor the government is addressing the potential loss of valuable species in Aswan Botanical Garden.

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## حصر وتقييم وتوثيق النباتات المزروعة فى الحديقة النباتية بأسوان - مصر

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**ملخص**

اجريت هذه الدراسة بهدف حصر وتقييم وتوثيق للنباتات المعمرة المزروعة فى الحديقة النباتية بأسوان ، جمهورية مصر العربية. تم جمع وتعريف (٣٦١) نوع نباتى و(٢٦٣) جنس نباتى تتبع (٨٨) فصيلة نباتية وذلك طبقا للمراجع المتاحة. وقد سجلت الفصيلة البقولية أعلى نسبة من الأنواع النبات(١٢,٧٤ % ) يليها الفصيلة النخيلية (٧,٧٥%) والفصيلة التوتية (٥,٥٤%) ثم الفصيلة البجنونية (٤,٧١%). تم تسجيل ١٦ نوعا نباتيا للفصيلة المرسينية (الكافورية) ، ١٤ نوعا للفصيلة اللبينية و ١٠ انواع لكل من الفصيلة الدفلية والفصيلة الشفوية . بالاضافة إلى ٦ فصائل تمثلت كل فصيلة بثلاثة انواع و ١١ فصيلة تمثلت كل منها بنوعان فقط ، بينما تمثلت ٤٢ فصيلة نباتية بنوع نباتى واحد فقط. تمثلت كل من الاشجار ، الشجيرات والعشبيات المعمرة بالنسب التالية من الانواع (٥٣,١٩%) ، (٢٠,٧٩%) و(٨,٠٣%) على التوالى. تمثلت الشجيرات المتسلقة ، النخيل المروحى و النخيل الريشى بالنسب التالية من الانواع (٧,٤٨%) ، (٤,١٦%) و (٣,٦١%) على التوالى ، بينما تمثلت كل من العصيريات ، اشباه النخيل و النجيليات الخشبية بالنسب التالية من الانواع (١,٩٣%) ، (٠,٥٥%) و(٠,٢٨%) على التوالى. لم يتم تسجيل الاعشاب المزروعة الحولية .على اية حال تعتبر الحديقة النباتية باسوان مصدرا ودليلا للنباتات المزروعة. تحتاج هذة المنطقة القيمة الى المزيد من دراسات الفلورة والبيئة للمحافظة عليها.

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