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## Introduced species in Flora of Libya

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### Highlights

- Data reported in this paper showed that there are 361 introduced plant species (17.72% of the species recorded in flora of Libya).
- The reported species include; ornamental plants, windbreak trees, weeds, field crops, vegetables and forage crops.
- These species established and become part of the Libyan flora. Some of which are poisonous to humans or animals and some are a strong competitor or allopathic to local plants.

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### ABSTRACT

Introduced Species in Flora of Libya were reported in this study, the results showed of 361 species of introduced plants (17.72%) from the species recorded in the flora of Libya. These species belong to 253 genera and 89 families. Six of these families belong to gymnosperms and the rest belong to angiosperms. The recorded species were introduced for different purposes, such as food, fodder, ornamental, and windbreaks. These species established and become part of the Libyan flora. Some of which are poisonous to humans or animals and some are a strong competitor or allopathic to local plants. In this paper, a list of introduced species, the origin of these species, and the purpose of their introduction will be included.

## 1. Introduction

Introduced plant species are species transported by biotic and abiotic factors to an area outside its native range (Vilà, *et al.*, 1999). The introduction can be deliberate or accidental; deliberate introduction by humans takes place for economic reasons such as the introduction of crops and stock feed or environmental reasons such as the introduction of plants for erosion control and forestation, or aesthetic value such as ornamental plants (*Eucalyptus*, *Casuarina*). On the other hand, the accidental introduction may take place by both biotic factors (humans and animals) or abiotic factors (wind, water, and transportation means). Even though some of the introduced species have economic value, particularly those introduced deliberately by humans, others may have a drastic impact on the ecosystem if they further spread beyond the place of introduction and cause damage to nearby species, get out of control and become invasive (Mahklouf, 2019).

The flora of Libya contains 2103 species belonging to 856 genera and 155 families. Angiosperms represented by 2088 species, 844 genera, and 155 families. Gymnosperms represented by 15 species, 12 genera, and 10 families (Jafri, and Ali 1981; Klopper *et*

*al.*, 2007). A considerable number of reported species are introduced either deliberately or accidentally (Vilà, *et al.*, 1999).

The work aimed to determine the number of introduced species in the flora of Libya, life forms, and the purpose of their introduction.

## 2. Materials and Methods

The study was based on the analysis works of literature deals with the flora of Libya (Ali & Jafri, 1976-1977; Jafri & EL-Gadi, 1977-1989), and related works of literature (Keith, 1965; Boulos, 1977; Boulos, 1979; Boulos & Jeffrey, 1979) by going through all the volumes (1-145) and listing all the families, which contain introduced species classification of species according to their life forms and purpose of the introduction.

## 3. Results and Discussion

Analysis of flora of Libya reveals the presence of 361 species of introduced plants (Table 1) (17.72 %) from the species recorded in the flora of Libya.

**Table 1**

Several species of introducing plants recorded in flora of Libya.

| No | Species                                               | Family           | Life form             | Life growth         |
|----|-------------------------------------------------------|------------------|-----------------------|---------------------|
| 1  | <i>Abelmoschus esculentus</i> (L.) Moench.            | Malvaceae        | Annual or perennial   | Herb                |
| 2  | <i>Acacia cyanophylla</i> Lindley.                    | Mimosaceae       | perennial             | Shrub or small Tree |
| 3  | <i>Acacia farnesiana</i> (L.) Willd.                  | Mimosaceae       | perennial             | Shrub or small Tree |
| 4  | <i>Acacia karroo</i> Hayne.                           | Mimosaceae       | perennial             | Small Tree          |
| 5  | <i>Acacia nilotica</i> (L.) Delile.                   | Mimosaceae       | perennial             | Small Tree          |
| 6  | <i>Acacia tortilis</i> (Forsk.) Hayne.                | Mimosaceae       | perennial             | Small Tree          |
| 7  | <i>Acer negundo</i> L.                                | Aceraceae        | perennial             | Shrub               |
| 8  | <i>Acokanthera oblongifolia</i> (Hochst.) L. E. Codd. | Apocynaceae      | perennial             | Shrub               |
| 9  | <i>Adhatoda vasica</i> Nees.                          | Acanthaceae      | perennial             | Shrub               |
| 10 | <i>Agave americana</i> L.                             | Agavaceae        | Perennial             | Herb                |
| 11 | <i>Agave atrovirens</i> Karw.                         | Agavaceae        | Perennial             | Tree                |
| 12 | <i>Agave attenuata</i> Salm- Dyck.                    | Agavaceae        | Perennial             | Herb                |
| 13 | <i>Agave celsii</i> Hook.                             | Agavaceae        | Perennial             | Herb                |
| 14 | <i>Agave ferox</i> C. Koch.                           | Agavaceae        | Perennial             | Tree                |
| 15 | <i>Agave franzosinii</i> Baker.                       | Agavaceae        | Perennial             | Herb                |
| 16 | <i>Agave kerchovei</i> Lem.                           | Agavaceae        | Perennial             | Herb                |
| 17 | <i>Agave sisalana</i> Perrine ex Engelm.              | Agavaceae        | Perennial             | Herb                |
| 18 | <i>Aizoon canariense</i> L.                           | Aizoaceae        | Annual or perennial   | Herb                |
| 19 | <i>Alcea rosea</i> L.                                 | Malvaceae        | perennial             | Herb                |
| 20 | <i>Allium cepa</i> L.                                 | Alliaceae        | Perennial             | Herb                |
| 21 | <i>Allium cepa</i> L. cv. Schallot                    | Alliaceae        | Perennial             | Herb                |
| 22 | <i>Allium fistulosum</i> L.                           | Alliaceae        | Perennial             | Herb                |
| 23 | <i>Allium sativum</i> L.                              | Alliaceae        | Perennial             | Herb                |
| 24 | <i>Allium schoenoprasum</i> L.                        | Alliaceae        | Perennial             | Herb                |
| 25 | <i>Amaranthus retroflexus</i> L.                      | Amaranthaceae    | Annual                | Herb                |
| 26 | <i>Amaranthus tricolor</i> L.                         | Amaranthaceae    | Annual                | Herb                |
| 27 | <i>Amygdalus communis</i> L.                          | Rosaceae         | Perennial             | Small Tree          |
| 28 | <i>Anemone coronaria</i> L.                           | Ranunculaceae    | perennial             | Herb                |
| 29 | <i>Anethum graveolens</i> L.                          | Apiaceae         | Annual                | Herb                |
| 30 | <i>Annona cherimola</i> Mill.                         | Annonaceae       | Perennial             | Small Tree          |
| 31 | <i>Anthyllis barba-jovis</i> L.                       | Fabaceae         | Perennial             | Shrub               |
| 32 | <i>Antirrhinum majus</i> L.                           | Scrophulariaceae | perennial             | Herb                |
| 33 | <i>Aptenia cordifolia</i> (Linn. f.) N. E. Brown.     | Aizoaceae        | Perennial             | Herb                |
| 34 | <i>Arachis hypogea</i> L.                             | Fabaceae         | Annual                | Herb                |
| 35 | <i>Araucaria excelsa</i> R. Br.                       | Araucariaceae    | Perennial             | Tree                |
| 36 | <i>Aristolochia elegans</i> Masters.                  | Aristolochiaceae | Perennial             | Herb climbing       |
| 37 | <i>Armeniaca vulgaris</i> Lam.                        | Rosaceae         | Perennial             | Tree                |
| 38 | <i>Armoracia rusticana</i> (Lam.) Gaertn.             | Brassicaceae     | Perennial             | Herb                |
| 39 | <i>Artemisia arborescens</i> L.                       | Asteraceae       | Annual                | Shrub               |
| 40 | <i>Avena sativa</i> L.                                | Poaceae          | Annual                | Herb                |
| 41 | <i>Begonia semperflorans</i> Link & Otto.             | Begoniaceae      | Perennial             | Herb                |
| 42 | <i>Bidens pilosa</i> L.                               | Asteraceae       | Annual                | Herb                |
| 43 | <i>Bilderdykia baldschuanica</i> (Regel.) D. A.       | Polygonaceae     | perennial             | climbing            |
| 44 | <i>Blackiella inflata</i> (F. Muell.) Aellen.         | Chenopodiaceae   | Annual                | Herb                |
| 45 | <i>Boehmeria nivea</i> (L.) Gaudich.                  | Urticaceae       | Perennial             | Shrub               |
| 46 | <i>Bombax ceiba</i> L.                                | Bombacaceae      | Perennial             | Tree                |
| 47 | <i>Bougainvillea glabra</i> Choisy .                  | Nactaginaceae    | perennial             | Shrub climbing      |
| 48 | <i>Bougainvillea spectabilis</i> Willd .              | Nactaginaceae    | perennial             | Shrub climbing      |
| 49 | <i>Brachychiton populneum</i> (Schott. &Endl.) R.Br.  | Sterculiaceae    | perennial             | Tree                |
| 50 | <i>Brassica juncea</i> (L.) Czern & Coss.             | Brassicaceae     | Annual or biennial    | Herb                |
| 51 | <i>Brassica napus</i> L.                              | Brassicaceae     | Annual or biennial    | Herb                |
| 52 | <i>Brassica nigra</i> (L.) Koch.                      | Brassicaceae     | Perennial             | Herb                |
| 53 | <i>Brassica oleracea</i> L.                           | Brassicaceae     | Perennial or biennial | Herb                |
| 54 | <i>Buddleja asiatica</i> Lour.                        | Buddlejaceae     | perennial             | Shrub or small Tree |
| 55 | <i>Caesalpinia gilliesii</i> (Hook.) Dietr.           | Caesalpinaceae   | perennial             | Shrub               |
| 56 | <i>Calendula officinalis</i> L.                       | Asteraceae       | Annual                | Herb                |
| 57 | <i>Callistemon citrinus</i> (Curt.) Stapf.            | Myrtaceae        | Perennial             | Tall Shrub          |
| 58 | <i>Camelina sativa</i> (L.) Crantz.                   | Brassicaceae     | Annual or biennial    | Herb                |
| 59 | <i>Campsis radicans</i> (L.) Seem.                    | Bignoniaceae     | perennial             | Shrub climbing      |
| 60 | <i>Canna edulis</i> Ker- Gawler.                      | Cannaceae        | perennial             | Herb                |
| 61 | <i>Canna indica</i> L.                                | Cannaceae        | perennial             | Herb                |
| 62 | <i>Capsium annuum</i> L.                              | Solanaceae       | Annual or perennial   | Herb                |
| 63 | <i>Capsium frutescens</i> L.                          | Solanaceae       | perennial             | Shrub               |
| 64 | <i>Carpobrotus edulis</i> (L.) N.E.                   | Aizoaceae        | Annual                | Herb                |
| 65 | <i>Carthamus tinctorius</i> L.                        | Asteraceae       | Annual or biennial    | Herb                |
| 66 | <i>Carum carvi</i> L.                                 | Apiaceae         | Biennial              | Herb                |
| 67 | <i>Casimiroa edulis</i> Llave.                        | Rutaceae         | Perennial             | Tree                |
| 68 | <i>Cassia occidentalis</i> L.                         | Caesalpinaceae   | perennial             | Small Shrub         |

Table 1 to be continued

|     |                                                     |                 |                     |                           |
|-----|-----------------------------------------------------|-----------------|---------------------|---------------------------|
| 69  | <i>Casuarina cunninghamiana</i> Miq.                | Casuarinaceae   | perennial           | Tree                      |
| 70  | <i>Casuarina decaisneana</i> F. Muell.              | Casuarinaceae   | perennial           | Tree                      |
| 71  | <i>Casuarina equisetifolia</i> Forst.               | Casuarinaceae   | perennial           | Tree                      |
| 72  | <i>Casuarina glauca</i> Sieb. ex Spreng.            | Casuarinaceae   | perennial           | Small Tree                |
| 73  | <i>Casuarina stricta</i> Ait.                       | Casuarinaceae   | perennial           | Shrub or small Tree       |
| 74  | <i>Casuarina torulosa</i> Ait.                      | Casuarinaceae   | perennial           | Shrub or small Tree       |
| 75  | <i>Catharanthus roseus</i> (L.) G. Don.             | Apocynaceae     | perennial           | Shrub or Herb             |
| 76  | <i>Celosia argentea</i> Linn.                       | Amaranthaceae   | Annual              | Herb                      |
| 77  | <i>Cenchrus incertus</i> M. A. Curtis.              | Poaceae         | Annual              | Herb                      |
| 78  | <i>Cerasus avium</i> (L.) Moench                    | Rosaceae        | Perennial           | Tree                      |
| 79  | <i>Chamaerops humilis</i> L.                        | Arecaceae       | Perennial           | Tree                      |
| 80  | <i>Chamomilla racutita</i> (L.) Rauschert.          | Asteraceae      | Annual              | Herb                      |
| 81  | <i>Chenopodium giganteum</i> D. Don.                | Chenopodiaceae  | Annual              | Herb                      |
| 82  | <i>Chorisia crispiflora</i> H. B. & K.              | Bombacaceae     | Perennial           | Tree                      |
| 83  | <i>Chrysanthemum carinatum</i> Schousboe.           | Asteraceae      | Annual              | Herb                      |
| 84  | <i>Cicer arietinum</i> L.                           | Fabaceae        | Annual              | Herb                      |
| 85  | <i>Cichorium endivia</i> L.                         | Asteraceae      | Annual or biennial  | Herb                      |
| 86  | <i>Cichorium intybus</i> L.                         | Asteraceae      | Perennial           | Herb                      |
| 87  | <i>Cinnamomum camphora</i> (L.) T. Nees & berm.     | Lauraceae       | Perennial           | Tree                      |
| 88  | <i>Citrullus lanatus</i> (Thumb.) Mansfeld.         | Cucurbitaceae   | Annual              | Herb                      |
| 89  | <i>Citrus aurantifolia</i> (Christmann) Swingle.    | Rutaceae        | Perennial           | Shrub or small tree       |
| 90  | <i>Citrus aurantium</i> L.                          | Rutaceae        | Perennial           | Small tree                |
| 91  | <i>Citrus deliciosa</i> Tenore.                     | Rutaceae        | Perennial           | Small tree                |
| 92  | <i>Citrus grandis</i> (L.) Osbeck.                  | Rutaceae        | Perennial           | Tree                      |
| 93  | <i>Citrus limetta</i> Risso.                        | Rutaceae        | Perennial           | Shrub or small tree       |
| 94  | <i>Citrus limonia</i> Osbeck.                       | Rutaceae        | Perennial           | Shrub or small tree       |
| 95  | <i>Citrus medica</i> L.                             | Rutaceae        | Perennial           | Shrub or small tree       |
| 96  | <i>Citrus paradisi</i> Macfadyen.                   | Rutaceae        | Perennial           | Small tree                |
| 97  | <i>Citrus sinensis</i> (L.) Osbeck.                 | Rutaceae        | Perennial           | Tree                      |
| 98  | <i>Coleus scutellarioides</i> (L.) Benth.           | Lamiaceae       | Perennial           | Herb                      |
| 99  | <i>Colubrina rufa</i> Reiss.                        | Rhamnaceae      | Perennial           | Erect shrub or small Tree |
| 100 | <i>Consolida ambigua</i> (L.) P. W. Ball & Heywood. | Ranunculaceae   | Annual              | Herb                      |
| 101 | <i>Corchorus olitorius</i> Linn.                    | Tiliaceae       | Annual              | Herb                      |
| 102 | <i>Cordia myxa</i> L.                               | Boraginaceae    | perennial           | Big Shrub or Tree         |
| 103 | <i>Coriandrum sativum</i> L.                        | Apiaceae        | Annual or biennial  | Herb                      |
| 104 | <i>Crambe maritima</i> L.                           | Brassicaceae    | Perennial           | Herb                      |
| 105 | <i>Crassula lycopodioides</i> Lam.                  | Crassulaceae    | perennial           | Small Shrub               |
| 106 | <i>Crataegus laevigata</i> (Poir) DC.               | Rosaceae        | Perennial           | Shrub                     |
| 107 | <i>Crataegus mexicana</i> Moc.                      | Rosaceae        | Perennial           | Small Tree                |
| 108 | <i>Crataegus pallasii</i> Griseb.                   | Rosaceae        | Perennial           | Shrub                     |
| 109 | <i>Crocus sativus</i> L.                            | Iridaceae       | perennial           | Herb                      |
| 110 | <i>Crotalaria juncea</i> L.                         | Fabaceae        | Annual              | Herb                      |
| 111 | <i>Cucumis anguria</i> L.                           | Cucurbitaceae   | Annual              | Herb                      |
| 112 | <i>Cucumis melo</i> L.                              | Cucurbitaceae   | Annual              | Herb                      |
| 113 | <i>Cucumis sativus</i> L.                           | Cucurbitaceae   | Annual              | Herb                      |
| 114 | <i>Cucurbita maxima</i> Duch.                       | Cucurbitaceae   | Annual              | Climbing                  |
| 115 | <i>Cucurbita moscata</i> (Duch.) Duch ex Poir.      | Cucurbitaceae   | Annual              | Climbing                  |
| 116 | <i>Cucurbita pepo</i> L.                            | Cucurbitaceae   | Annual              | Climbing                  |
| 117 | <i>Cuminum cyminum</i> L.                           | Apiaceae        | Annual              | Herb                      |
| 118 | <i>Cycas revoluta</i> Thumb.                        | Cycadaceae      | Perennial           | Tree                      |
| 119 | <i>Cydonia oblonga</i> Mill.                        | Rosaceae        | Perennial           | Small Tree                |
| 120 | <i>Cynara scolymus</i> L.                           | Asteraceae      | Perennial           | Herb                      |
| 121 | <i>Cyperus alternifolius</i> L.                     | Cyperaceae      | Perennial           | Herb                      |
| 122 | <i>Cyperus papyrus</i> L.                           | Cyperaceae      | Perennial           | Herb                      |
| 123 | <i>Datura arborea</i> L.                            | Solanaceae      | perennial           | Shrub or small Tree       |
| 124 | <i>Datura fastuosa</i> Mill.                        | Solanaceae      | Annual              | Herb                      |
| 125 | <i>Daucus carota</i> L.                             | Apiaceae        | Biennial            | Herb                      |
| 126 | <i>Delonix regia</i> (Bojer.) Rafn.                 | Caesalpiniaceae | perennial           | Large Tree                |
| 127 | <i>Dianthus caryophyllus</i> L.                     | Caryophyllaceae | Perennial           | Herb                      |
| 128 | <i>Dianthus chinensis</i> L.                        | Caryophyllaceae | Annual or perennial | Herb                      |
| 129 | <i>Dracaena draco</i> (L.) L.                       | Agavaceae       | Perennial           | Tree                      |
| 130 | <i>Duranta repens</i> L.                            | Verbenaceae     | perennial           | Shrub                     |
| 131 | <i>Eleusine coracana</i> (L.) Gaertn.               | Poaceae         | Annual              | Herb                      |
| 132 | <i>Eragrostis tef</i> (zucc.) Trotter.              | Poaceae         | Annual              | Herb                      |
| 133 | <i>Eriobotrya japonica</i> (Thumb.) Lindl.          | Rosaceae        | Perennial           | Shrub or small tree       |
| 134 | <i>Eschscholtzia California</i> Cham.               | Papaveraceae    | Perennial           | Herb                      |
| 135 | <i>Esenbeckia leiocarpa</i> Engler.                 | Rutaceae        | Perennial           | Shrub or Tree             |
| 136 | <i>Eucalyptus camaldulensis</i> Dehnhardt.          | Myrtaceae       | Perennial           | Tree                      |
| 137 | <i>Eucalyptus cosmophylla</i> F. Muell.             | Myrtaceae       | Perennial           | Tall Shrub or small Tree  |
| 138 | <i>Eucalyptus erithrocorys</i> F. Muell.            | Myrtaceae       | Perennial           | Tall Shrub or medium Tree |

Table 1 to be continued

|     |                                                         |                |                     |                             |
|-----|---------------------------------------------------------|----------------|---------------------|-----------------------------|
| 139 | <i>Eucalyptus gomphocephala</i> DC. Prodr.              | Myrtaceae      | Perennial           | Tall Tree                   |
| 140 | <i>Eucalyptus leucoxylon</i> F. Muell.                  | Myrtaceae      | Perennial           | Medium or tall Tree         |
| 141 | <i>Eucalyptus leucoxylon</i> var <i>minor</i> F. Muell. | Myrtaceae      | Perennial           | Medium or tall Tree         |
| 142 | <i>Eucalyptus rudris</i> Endl.                          | Myrtaceae      | Perennial           | Tree                        |
| 143 | <i>Euonymus japonicus</i> Thunb.                        | Celastraceae   | Perennial           | Shrub or small Tree         |
| 144 | <i>Euphorbia heterophylla</i> L.                        | Euphorbiaceae  | Annual              | Herb                        |
| 145 | <i>Feijoa sellowiana</i> Berg.                          | Myrtaceae      | Perennial           | Shrub                       |
| 146 | <i>Ferula assa- foetida</i> L.                          | Apiaceae       | Perennial           | Herb                        |
| 147 | <i>Ficus retusa</i> L.                                  | Moraceae       | perennial           | Shrub or Tree               |
| 148 | <i>Fragaria vesca</i> L.                                | Rosaceae       | Perennial           | Herb                        |
| 149 | <i>Fraxinus excelsior</i> Linn.                         | Oleaceae       | Perennial           | Tree                        |
| 150 | <i>Furcraea selloa</i> C. Koch.                         | Agavaceae      | Perennial           | Herb                        |
| 151 | <i>Galinsoga parviflora</i> Cav.                        | Asteraceae     | Annual              | Herb                        |
| 152 | <i>Ginkgo biloba</i> L.                                 | Cycadaceae     | Perennial           | Tree                        |
| 153 | <i>Gisekia pharnaceoides</i> Linn.                      | Molluginaceae  | Annual              | Herb                        |
| 154 | <i>Gomphrena globosa</i> L.                             | Amaranthaceae  | Annual              | Herb                        |
| 155 | <i>Gossypium arboreum</i> L.                            | Malvaceae      | perennial           | shrub or small tree         |
| 156 | <i>Gossypium barbadense</i> L.                          | Malvaceae      | Annual or perennial | Subshrub or Shrub           |
| 157 | <i>Gossypium herbaceum</i> L.                           | Malvaceae      | Perennial           | Subshrub                    |
| 158 | <i>Gossypium hirsutum</i> L.                            | Malvaceae      | Perennial           | Subshrub                    |
| 159 | <i>Grevillea robusta</i> A. Cunn. ex R. Br.             | Proteaceae     | Perennial           | Tree                        |
| 160 | <i>Gynandropsis gynandra</i> (L.) Briq.                 | Capparaceae    | Annual              | Herb                        |
| 161 | <i>Haloxylon aphyllum</i> (Minkw.) Iljin.               | Chenopodiaceae | Perennial           | Tall Shrub or small Tree    |
| 162 | <i>Helianthus annuus</i> L.                             | Asteraceae     | Perennial           | Herb                        |
| 163 | <i>Helianthus tuberosus</i> L.                          | Asteraceae     | Annual              | Herb                        |
| 164 | <i>Heliotropium curassavicum</i> L.                     | Boraginaceae   | perennial           | Herb                        |
| 165 | <i>Hermodactylus tuberosus</i> (L.) Mill.               | Iridaceae      | perennial           | Herb                        |
| 166 | <i>Hibiscus arnottianus</i> A. Gray.                    | Malvaceae      | Perennial           | Large shrub or small tree   |
| 167 | <i>Hibiscus cannabinus</i> L.                           | Malvaceae      | Annual or perennial | Herb                        |
| 168 | <i>Hibiscus mutabilis</i> L.                            | Malvaceae      | Perennial           | Large shrub or tree         |
| 169 | <i>Hibiscus rosa-sinensis</i> L.                        | Malvaceae      | Perennial           | Large shrub or small tree   |
| 170 | <i>Hibiscus sabdariffa</i> L.                           | Malvaceae      | Annual              | Herb                        |
| 171 | <i>Hibiscus schizopetalus</i> (Mast.) Hook.             | Malvaceae      | Perennial           | Tall shrub                  |
| 172 | <i>Hibiscus trianum</i> L.                              | Malvaceae      | Annual              | Herb                        |
| 173 | <i>Hordeum distichon</i> L.                             | Poaceae        | Annual              | Herb                        |
| 174 | <i>Hordeum vulgare</i> L.                               | Poaceae        | Annual              | Herb                        |
| 175 | <i>Ipomoea batatas</i> (L.) Lam.                        | Convolvulaceae | Perennial           | Herb                        |
| 176 | <i>Ipomoea hederacea</i> (L.) R. Jacq.                  | Convolvulaceae | Perennial           | Herb Climbing               |
| 177 | <i>Iris germanica</i> L.                                | Iridaceae      | perennial           | Herb                        |
| 178 | <i>Iris juncea</i> Poir.                                | Iridaceae      | perennial           | Herb                        |
| 179 | <i>Jacaranda ovalifolia</i> R.Br.                       | Bignoniaceae   | perennial           | Shrub or Tree               |
| 180 | <i>Jacobinia spicigera</i> (Schlecht.) L. H. Bailey.    | Acanthaceae    | perennial           | Shrub                       |
| 181 | <i>Jasminum azoricum</i> Linn.                          | Oleaceae       | Perennial           | Shrub Climbing              |
| 182 | <i>Jasminum grandiflorum</i> Linn.                      | Oleaceae       | Perennial           | Large Shrub                 |
| 183 | <i>Jasminum mesnyi</i> Hance.                           | Oleaceae       | Perennial           | Shrub or Climbing           |
| 184 | <i>Jasminum officinal</i> Linn.                         | Oleaceae       | Perennial           | Erect Shrub                 |
| 185 | <i>Jasminum samloac</i> (Linn.) Soland.                 | Oleaceae       | Perennial           | Sub erect Shrub or Climbing |
| 186 | <i>Juglans regia</i> L.                                 | Juglandaceae   | perennial           | Tree                        |
| 187 | <i>Kochia scoparia</i> (L.) Schrad.                     | Chenopodiaceae | Annual              | Herb                        |
| 188 | <i>Lablab purpureus</i> (L.) Sweet                      | Fabaceae       | Annual or perennial | Herb                        |
| 189 | <i>Lactuca sativa</i> L.                                | Asteraceae     | Annual or biennial  | Herb                        |
| 190 | <i>Lactuca serriola</i> L.                              | Asteraceae     | Annual or biennial  | Herb                        |
| 191 | <i>Lagenaria siceraria</i> (Molina.) Standley.          | Cucurbitaceae  | Annual              | Climbing                    |
| 192 | <i>Lagerstroemia indica</i> L.                          | Lythraceae     | perennial           | Shrub or Tree               |
| 193 | <i>Lagunaria patersonii</i> G. Don.                     | Malvaceae      | Perennial           | Tree                        |
| 194 | <i>Lantana camara</i> L.                                | Verbenaceae    | perennial           | Shrub                       |
| 195 | <i>Lathyrus odoratus</i> L.                             | Fabaceae       | Annual              | Herb                        |
| 196 | <i>Lathyrus sativus</i> L.                              | Fabaceae       | Annual              | Herb                        |
| 197 | <i>Laurocerasus officinalis</i> Roem.                   | Rosaceae       | Perennial           | Shrub                       |
| 198 | <i>Laurus azorica</i> (Seub.) J.A.                      | Lauraceae      | Perennial           | Shrub or Tree               |
| 199 | <i>Lens culinaris</i> Medic.                            | Fabaceae       | Annual              | Herb                        |
| 200 | <i>Ligustrum lucidum</i> Ait.                           | Oleaceae       | Perennial           | Tall Shrub or Tree          |
| 201 | <i>Ligustrum ovalifolium</i> Hassk.                     | Oleaceae       | Perennial           | Erect Shrub                 |
| 202 | <i>Linum usitatissimum</i> L.                           | Linaceae       | Annual or biennial  | Herb                        |
| 203 | <i>Lippia triphylla</i> (L. Herit.) Kuntze.             | Verbenaceae    | perennial           | Shrub or small Tree         |
| 204 | <i>Luffa cylindrica</i> (L.) M. Roem.                   | Cucurbitaceae  | Annual              | Climbing                    |
| 205 | <i>Lupinus albus</i> L.                                 | Fabaceae       | Annual              | Herb                        |
| 206 | <i>Lyeopersicon esculentum</i> Mill.                    | Solanaceae     | Annual              | Herb                        |
| 207 | <i>Malus angustifolia</i> Minchx.                       | Rosaceae       | Perennial           | Small Tree                  |
| 208 | <i>Malus sylvestris</i> Mill.                           | Rosaceae       | Perennial           | Tree                        |

Table 1 to be continued

|     |                                                                                |                 |                     |                           |
|-----|--------------------------------------------------------------------------------|-----------------|---------------------|---------------------------|
| 209 | <i>Malva verticillata</i> L.                                                   | Malvaceae       | Annual              | Herb                      |
| 210 | <i>Malvaviscus arboreus</i> Cav. Diss.                                         | Malvaceae       | Perennial           | Large shrub or small tree |
| 211 | <i>Malvaviscus arboreus</i> Cav. Diss. var. <i>penduliformis</i> (DC.) Schrey. | Malvaceae       | Perennial           | Large shrub or small tree |
| 212 | <i>Matthiola incana</i> (L.) R. Br.                                            | Brassicaceae    | Perennial           | Herb                      |
| 213 | <i>Medicago lupulina</i> L.                                                    | Fabaceae        | Perennial           | Herb                      |
| 214 | <i>Medicago sativa</i> L.                                                      | Fabaceae        | Perennial           | Herb                      |
| 215 | <i>Melaleuca preissiana</i> Schau.                                             | Myrtaceae       | Perennial           | Tall Shrub or small Tree  |
| 216 | <i>Melia azedarach</i> L.                                                      | Meliaceae       | perennial           | Tree                      |
| 217 | <i>Melilotus officinalis</i> (L.) Pall.                                        | Fabaceae        | Annual              | Herb                      |
| 218 | <i>Mentha piperata</i> L.                                                      | Lamiaceae       | Perennial           | Herb                      |
| 219 | <i>Mentha spicata</i> L.                                                       | Lamiaceae       | Perennial           | Herb                      |
| 220 | <i>Mesembryanthemum crystallinum</i> L.                                        | Aizoaceae       | Annual              | Herb                      |
| 221 | <i>Mirabilis jalapa</i> L.                                                     | Nactaginaceae   | perennial           | Herb                      |
| 222 | <i>Mollugo cerviana</i> (Linn.) Ser.                                           | Molluginaceae   | Annual              | Herb                      |
| 223 | <i>Mollugo nudicaulis</i> Lam.                                                 | Molluginaceae   | Annual              | Herb                      |
| 224 | <i>Momordica balsamina</i> L.                                                  | Cucurbitaceae   | Annual or perennial | Climbing                  |
| 225 | <i>Momordica charantia</i> L.                                                  | Cucurbitaceae   | Annual or perennial | Climbing                  |
| 226 | <i>Morus alba</i> L.                                                           | Moraceae        | perennial           | Tree                      |
| 227 | <i>Morus nigra</i> L.                                                          | Moraceae        | perennial           | Tree                      |
| 228 | <i>Musa nana</i> Lour.                                                         | Musaceae        | Perennial           | Shrub                     |
| 229 | <i>Myoporum serratum</i> R. Br. Prod                                           | Mypopraceae     | perennial           | Shrub or small Tree       |
| 230 | <i>Nectandra grandiflora</i> Nees & Eberm ex Nees.                             | Lauraceae       | Perennial           | Tree                      |
| 231 | <i>Nicodemia madagascariensis</i> (Lamk.) Parker.                              | Buddlejaceae    | perennial           | Shrub                     |
| 232 | <i>Nicotina rustica</i> L.                                                     | Solanaceae      | Annual              | Herb                      |
| 233 | <i>Nicotina tabacum</i> L.                                                     | Solanaceae      | Annual              | Herb                      |
| 234 | <i>Nigella sativa</i> L.                                                       | Ranunculaceae   | Annual              | Herb                      |
| 235 | <i>Nymphaea odorata</i> Soland.                                                | Nymphaeaceae    | perennial           | Herb                      |
| 236 | <i>Ocimum basilicum</i> L.                                                     | Lamiaceae       | Perennial           | Herb                      |
| 237 | <i>Onyza bonariensis</i> (L.) Cornq.                                           | Asteraceae      | Annual              | Herb                      |
| 238 | <i>Onyza canadensis</i> (L.) Cornq.                                            | Asteraceae      | Annual              | Herb                      |
| 239 | <i>Opuntia imbricata</i> DC.                                                   | Cactaceae       | perennial           | Shrub or Tree             |
| 240 | <i>Opuntia tuna</i> Mill.                                                      | Cactaceae       | perennial           | Shrub                     |
| 241 | <i>Origanum vulgare</i> L.                                                     | Lamiaceae       | Perennial           | Herb                      |
| 242 | <i>Oryza sativa</i> L.                                                         | Poaceae         | Annual              | Herb                      |
| 243 | <i>Oxalis articulata</i> Savigny.                                              | Oxalidaceae     | perennial           | Herb                      |
| 244 | <i>Paliurus spina-christi</i> Mill.                                            | Rhamnaceae      | Perennial           | Shrub                     |
| 245 | <i>Panicum miliaceum</i> L.                                                    | Poaceae         | Annual              | Herb                      |
| 246 | <i>Papaver somniferum</i> L.                                                   | Papaveraceae    | Annual              | Herb                      |
| 247 | <i>Parkinsonia aculeata</i> L.                                                 | Caesalpiniaceae | perennial           | Shrub or small Tree       |
| 248 | <i>Passiflora coerulea</i> L.                                                  | Passifloraceae  | perennial           | Shrub                     |
| 249 | <i>Peganum harmala</i> L.                                                      | Zygophyllaceae  | Perennial           | Herb                      |
| 250 | <i>Pelargonium grandiflorum</i> (And.) Willd.                                  | Geraniaceae     | Perennial           | Shrub                     |
| 251 | <i>Pelargonium odoratissimum</i> (L.) Solard.                                  | Geraniaceae     | perennial           | Herb                      |
| 252 | <i>Pelargonium peltatum</i> (L.) Soland.                                       | Geraniaceae     | Annual or perennial | Herb                      |
| 253 | <i>Pelargonium radula</i> (Cav.) L Her.                                        | Geraniaceae     | Perennial           | Shrub                     |
| 254 | <i>Pennisetum americanum</i> (L.) Schumann.                                    | Poaceae         | Annual              | Herb                      |
| 255 | <i>Persea americana</i> Mill.                                                  | Lauraceae       | Perennial           | Tree                      |
| 256 | <i>Persica vulgaris</i> Mill                                                   | Rosaceae        | Perennial           | Large shrub or small tree |
| 257 | <i>Petunia hybrida</i> Hort .                                                  | Solanaceae      | Annual or perennial | Herb                      |
| 258 | <i>Phaseolus vulgaris</i> L.                                                   | Fabaceae        | Annual              | Herb                      |
| 259 | <i>Phlox drummondii</i> W. J. Hook.                                            | Polemoniaceae   | Annual              | Herb                      |
| 260 | <i>Phoenix canariensis</i> Chabaud.                                            | Arecaceae       | Perennial           | Tree                      |
| 261 | <i>Photinia serrulata</i> Lindl.                                               | Rosaceae        | Perennial           | Small Tree                |
| 262 | <i>Physalis peruviana</i> L.                                                   | Solanaceae      | perennial           | Herb                      |
| 263 | <i>Phytolacca dioica</i> Lour.                                                 | Phytolaccaceae  | Perennial           | Tree                      |
| 264 | <i>Pinus canariensis</i> Sweet ex Sprengel.                                    | Pinaceae        | Perennial           | Tree                      |
| 265 | <i>Pistacia vera</i> L.                                                        | Anacardiaceae   | Perennial           | Shrub or small tree       |
| 266 | <i>Pisum sativum</i> L.                                                        | Fabaceae        | Annual              | Herb climbing             |
| 267 | <i>Plantago major</i> Sp.                                                      | Plantaginaceae  | perennial           | Herb                      |
| 268 | <i>Plumbago auriculata</i> Lam.                                                | Plumbaginaceae  | Perennial           | Shrub climbing            |
| 269 | <i>Plumeria acutifolia</i> Poir .                                              | Apocynaceae     | perennial           | Shrub or small Tree       |
| 270 | <i>Poa pratensis</i> L.                                                        | Poaceae         | Annual              | Herb                      |
| 271 | <i>Polianthes tuberosa</i> L.                                                  | Agavaceae       | Perennial           | Herb                      |
| 272 | <i>Populus x canadensis</i> Moench.                                            | Salicaceae      | Perennial           | Tree                      |
| 273 | <i>Portulaca grandiflora</i> Hook.                                             | Portulacaceae   | perennial           | Herb                      |
| 274 | <i>Prosopis juliflora</i> (Swarl) DC.                                          | Mimosaceae      | perennial           | Shrub                     |
| 275 | <i>Prunus cerasifera</i> Ehrh.                                                 | Rosaceae        | Perennial           | Small Tree                |
| 276 | <i>Prunus domestica</i> L.                                                     | Rosaceae        | Perennial           | Small Tree                |
| 277 | <i>Prunus japonica</i> Thunb.                                                  | Rosaceae        | Perennial           | Shrub                     |
| 278 | <i>Prunus nigra</i> Ait.                                                       | Rosaceae        | Perennial           | Shrub                     |



Table 1 to be continued

|     |                                                                   |                  |                     |                        |
|-----|-------------------------------------------------------------------|------------------|---------------------|------------------------|
| 279 | <i>Psidium guajava</i> L.                                         | Myrtaceae        | Perennial           | Shrub or small Tree    |
| 280 | <i>Pyrus communis</i> L.                                          | Rosaceae         | Perennial           | Tree                   |
| 281 | <i>Quercus faginea</i> Lam.                                       | Fagaceae         | Perennial           | Tree                   |
| 282 | <i>Quercus suber</i> L.                                           | Fagaceae         | Perennial           | Tree                   |
| 283 | <i>Raphanus raphanistrum</i> L.                                   | Brassicaceae     | Annual              | Herb                   |
| 284 | <i>Raphanus sativus</i> L.                                        | Brassicaceae     | Annual or biennial  | Herb                   |
| 285 | <i>Raphiolepis indica</i> (L.) Lindl.                             | Rosaceae         | Perennial           | Shrub                  |
| 286 | <i>Rhoeo spathacea</i> (Swartz.) Stearn.                          | Commelinaceae    | Perennial           | Herb                   |
| 287 | <i>Ricinus communis</i> L.                                        | Euphorbiaceae    | perennial           | Shrub                  |
| 288 | <i>Rorippa islandica</i> (Oeder.) Borbas.                         | Brassicaceae     | Annual or biennial  | Herb                   |
| 289 | <i>Rosa damascena</i> Mill.                                       | Rosaceae         | Perennial           | Shrub                  |
| 290 | <i>Rosa gallica</i> L.                                            | Rosaceae         | Perennial           | Low Shrub              |
| 291 | <i>Rubia tinctorum</i> L.                                         | Rubiaceae        | perennial           | Herb                   |
| 292 | <i>Rumex lunaria</i> L.                                           | Polygonaceae     | perennial           | Shrub                  |
| 293 | <i>Ruscus hypophyllum</i> L.                                      | Liliaceae        | Perennial           | Shrub                  |
| 294 | <i>Ruta graveolens</i> L.                                         | Rutaceae         | Perennial           | Herb                   |
| 295 | <i>Saccharum officinarum</i> L.                                   | Poaceae          | Perennial           | Shrub                  |
| 296 | <i>Salix babylonica</i> L.                                        | Salicaceae       | Perennial           | Tree                   |
| 297 | <i>Salvia coccinea</i> Etlinger.                                  | Lamiaceae        | Annual or biennial  | Herb                   |
| 298 | <i>Salvia splendens</i> Sellow ex Roem.                           | Lamiaceae        | Perennial           | Herb                   |
| 299 | <i>Sansevieria zeylanica</i> Willd var <i>laurentii</i> Hort.     | Agavaceae        | Perennial           | Herb                   |
| 300 | <i>Schinus molle</i> L.                                           | Anacardiaceae    | Perennial           | Shrub or medium tree   |
| 301 | <i>Schinus terebinthifolius</i> Raddi.                            | Anacardiaceae    | Perennial           | Shrub or medium tree   |
| 302 | <i>Scolymus hispanicus</i> L.                                     | Asteraceae       | Annual or biennial  | Herb                   |
| 303 | <i>Scorzonera hispanica</i> L.                                    | Asteraceae       | Perennial           | Herb                   |
| 304 | <i>Secale cereale</i> L.                                          | Poaceae          | Annual              | Herb                   |
| 305 | <i>Sechium edule</i> Swartz.                                      | Cucurbitaceae    | Annual              | Herb                   |
| 306 | <i>Senecio angulata</i> L.                                        | Asteraceae       | Annual              | Herb climbing          |
| 307 | <i>Senecio vulgaris</i> L.                                        | Asteraceae       | Annual              | Herb                   |
| 308 | <i>Sesamum indicum</i> Lnn.                                       | Pedaliaceae      | Annual              | Herb                   |
| 309 | <i>Setaria italica</i> (L.) P. Beauv.                             | Poaceae          | Annual              | Herb                   |
| 310 | <i>Setcreasea purpurea</i> (Schau.) Boom.                         | Commelinaceae    | Perennial           | Herb                   |
| 311 | <i>Silene gallica</i> L.                                          | Caryophyllaceae  | Annual              | Herb                   |
| 312 | <i>Silene rubella</i> L.                                          | Caryophyllaceae  | Annual              | Herb                   |
| 313 | <i>Sisymbrium officinale</i> (L.) Scop.                           | Brassicaceae     | Annual or biennial  | Herb                   |
| 314 | <i>Solanum melongena</i> L.                                       | Solanaceae       | perennial           | Herb                   |
| 315 | <i>Solanum sublobatum</i> L.                                      | Solanaceae       | perennial           | Herb                   |
| 316 | <i>Solanum tuberosum</i> L.                                       | Solanaceae       | Annual or perennial | Herb                   |
| 317 | <i>Sorghum bicolor</i> (L.) Moench.                               | Poaceae          | Annual or perennial | Herb                   |
| 318 | <i>Sorghum sudanense</i> (Piper.) Stapf.                          | Poaceae          | Annual              | Herb                   |
| 319 | <i>Sphaeralcea umbellata</i> (Cav.) G. Don.                       | Malvaceae        | Perennial           | Shrub                  |
| 320 | <i>Spinacia oleracea</i> L.                                       | Chenopodiaceae   | Annual              | Herb                   |
| 321 | <i>Strelitzia reginae</i> Banks.                                  | Strelitzaceae    | perennial           | Herb                   |
| 322 | <i>Syringa vulgaris</i> L.                                        | Oleaceae         | Perennial           | Shrub or Tree          |
| 323 | <i>Tamarindus indica</i> L.                                       | Caesalpiniaceae  | perennial           | Large Tree             |
| 324 | <i>Tamarix ramosissima</i> Ledeb.                                 | Tamaricaceae     | Annual or perennial | Shrub or small Tree    |
| 325 | <i>Tanacetum parthenium</i> (L.) Schultz.                         | Asteraceae       | Annual              | Herb                   |
| 326 | <i>Taraxacum turcicum</i> Van.                                    | Asteraceae       | Perennial           | Herb                   |
| 327 | <i>Tecoma stans</i> Juss.                                         | Bignoniaceae     | perennial           | Shrub                  |
| 328 | <i>Tecoma stans</i> Juss. var. <i>mollis</i> (H. B. & K.) Siddiqi | Bignoniaceae     | perennial           | Shrub                  |
| 329 | <i>Tecomaria capensis</i> (Thunb.) Spach.                         | Bignoniaceae     | perennial           | Shrub                  |
| 330 | <i>Tetragonia tetragonoides</i> (Pallas.) O.                      | Tetragoniaceae   | Annual or perennial | Herb                   |
| 331 | <i>Thevetia yccootli</i> DC.                                      | Apocynaceae      | perennial           | Shrub or small Tree    |
| 332 | <i>Thuja orientalis</i> L.                                        | Cupressaceae     | Perennial           | Shrub or Tree          |
| 333 | <i>Tilia platyphyllos</i> Scop.                                   | Tiliaceae        | Perennial           | Tree                   |
| 334 | <i>Trachelospermum jasminoides</i> Lem.                           | Apocynaceae      | perennial           | Shrub climbing         |
| 335 | <i>Tradescantia albiflora</i> Kunth.                              | Commelinaceae    | Perennial           | Herb                   |
| 336 | <i>Tradescantia fluminensis</i> Vell.                             | Commelinaceae    | Perennial           | Herb                   |
| 337 | <i>Triticum aestivum</i> L.                                       | Poaceae          | Annual              | Herb                   |
| 338 | <i>Triticum compactum</i> Host.                                   | Poaceae          | Annual              | Herb                   |
| 339 | <i>Triticum durum</i> Desf.                                       | Poaceae          | Annual              | Herb                   |
| 340 | <i>Triticum polonicum</i> L.                                      | Poaceae          | Annual              | Herb                   |
| 341 | <i>Triticum spelta</i> L.                                         | Poaceae          | Annual              | Herb                   |
| 342 | <i>Tropaeolum majus</i> L.                                        | Tropaeolaceae    | perennial           | Herb                   |
| 343 | <i>Ulmus umbraculifera</i> (Trautv.) Zielinski.                   | Ulmaceae         | perennial           | Tree                   |
| 344 | <i>Ventilago viminalis</i> Hook.                                  | Rhamnaceae       | Perennial           | Climbing shrub or Tree |
| 345 | <i>Verbena tenuisecta</i> Briq.                                   | Verbenaceae      | perennial           | Herb                   |
| 346 | <i>Veronica hederifolia</i> L.                                    | Scrophulariaceae | Annual              | Herb                   |
| 347 | <i>Veronica persica</i> Poiret                                    | Scrophulariaceae | Annual              | Herb                   |
| 348 | <i>Veronica polita</i> Fries.                                     | Scrophulariaceae | Annual              | Herb                   |

Table 1 to be continued

|     |                                      |               |                     |               |
|-----|--------------------------------------|---------------|---------------------|---------------|
| 349 | <i>Vicia faba</i> L.                 | Fabaceae      | Annual              | Herb          |
| 350 | <i>Vigna unguiculata</i> (L.) Walp   | Fabaceae      | Annual              | Herb          |
| 351 | <i>Vitex agnus-castus</i> L.         | Verbenaceae   | perennial           | Shrub         |
| 352 | <i>Vitis labrusca</i> L.             | Vitaceae      | perennial           | Herb climbing |
| 353 | <i>Vitis vinifera</i> L.             | Vitaceae      | perennial           | Herb climbing |
| 354 | <i>Xanthium spinosum</i> L.          | Asteraceae    | Annual              | Herb          |
| 355 | <i>Yucca aloifolia</i> L.            | Agavaceae     | Perennial           | Tree          |
| 356 | <i>Yucca gloriosa</i> L.             | Agavaceae     | Perennial           | Tree          |
| 357 | <i>Zaleya pentandra</i> (L.) Jeffrey | Aizoaceae     | Annual or perennial | Herb          |
| 358 | <i>Zea mays</i> L.                   | Poaceae       | Perennial           | Shrub         |
| 359 | <i>Zebrina pendula</i> Schnizl.      | Commelinaceae | Perennial           | Herb          |
| 360 | <i>Ziziphus spina-christi</i> Mill.  | Rhamnaceae    | Perennial           | Small Tree    |
| 361 | <i>Ziziphus jujube</i> Mill.         | Rhamnaceae    | Perennial           | Shrub or Tree |

Species arranged alphabetically. These species belong to 253 genera and 89 families (Table 2).

Table 2

A number of families, genera, and species of introducing plants recorded in flora of Libya.

| No. | Family           | Number of Genera | Number of Species | No.   | Family           | Number of Genera | Number of Species |
|-----|------------------|------------------|-------------------|-------|------------------|------------------|-------------------|
| 1   | Acanthaceae      | 2                | 2                 | 43    | Liliaceae        | 1                | 1                 |
| 2   | Aceraceae        | 1                | 1                 | 44    | Lythraceae       | 1                | 1                 |
| 3   | Aizoaceae        | 4                | 4                 | 45    | Malvaceae        | 7                | 15                |
| 4   | Agavaceae        | 6                | 14                | 46    | Meliaceae        | 1                | 1                 |
| 5   | Alliaceae        | 1                | 5                 | 47    | Mimosaceae       | 2                | 6                 |
| 6   | Amaranthaceae    | 3                | 4                 | 48    | Molluginaceae    | 2                | 2                 |
| 7   | Anacardiaceae    | 2                | 3                 | 49    | Moraceae         | 2                | 3                 |
| 8   | Annonaceae       | 1                | 1                 | 50    | Myoporaceae      | 1                | 1                 |
| 9   | Apiaceae         | 8                | 8                 | 51    | Myrtaceae        | 5                | 11                |
| 10  | Apocynaceae      | 5                | 5                 | 52    | Musaceae         | 1                | 1                 |
| 11  | Araucariaceae    | 1                | 1                 | 53    | Nactaginaceae    | 2                | 3                 |
| 12  | Arecaceae        | 2                | 2                 | 54    | Nymphaeaceae     | 1                | 1                 |
| 13  | Aristolochiaceae | 1                | 1                 | 55    | Oleaceae         | 4                | 8                 |
| 14  | Asteraceae       | 18               | 23                | 56    | Papaveraceae     | 2                | 2                 |
| 15  | Begoniaceae      | 1                | 1                 | 57    | Passifloraceae   | 1                | 1                 |
| 16  | Bignoniaceae     | 4                | 5                 | 58    | Pedaliaceae      | 1                | 1                 |
| 17  | Bombacaceae      | 2                | 2                 | 59    | Pinaceae         | 1                | 1                 |
| 18  | Boraginaceae     | 2                | 2                 | 60    | Plantaginaceae   | 1                | 1                 |
| 19  | Brassicaceae     | 8                | 12                | 61    | Plumbaginaceae   | 1                | 1                 |
| 20  | Buddlejaceae     | 2                | 2                 | 62    | Poaceae          | 15               | 21                |
| 21  | Caesalpiniaceae  | 5                | 5                 | 63    | Polemoniaceae    | 1                | 1                 |
| 22  | Cactaceae        | 1                | 1                 | 64    | Polygonaceae     | 2                | 2                 |
| 23  | Cannaceae        | 1                | 1                 | 65    | Portulacaceae    | 1                | 1                 |
| 24  | Capparaceae      | 1                | 1                 | 66    | Proteaceae       | 1                | 1                 |
| 25  | Caryophyllaceae  | 2                | 4                 | 67    | Phytolaccaceae   | 1                | 1                 |
| 26  | Casuarinaceae    | 1                | 6                 | 68    | Ranunculaceae    | 3                | 3                 |
| 27  | Celastraceae     | 1                | 1                 | 69    | Resedaceae       | 1                | 1                 |
| 28  | Chenopodiaceae   | 5                | 5                 | 70    | Rhamnaceae       | 4                | 5                 |
| 29  | Crassulaceae     | 1                | 1                 | 71    | Rosaceae         | 15               | 22                |
| 30  | Commelinaceae    | 4                | 5                 | 72    | Rutaceae         | 4                | 12                |
| 31  | Convolvulaceae   | 1                | 2                 | 73    | Salicaceae       | 1                | 2                 |
| 32  | Cycadaceae       | 2                | 2                 | 74    | Scrophulariaceae | 3                | 6                 |
| 33  | Cyperaceae       | 1                | 2                 | 75    | Solanaceae       | 7                | 11                |
| 34  | Cucurbitaceae    | 7                | 12                | 76    | Sterculiaceae    | 1                | 1                 |
| 35  | Cupressaceae     | 1                | 1                 | 77    | Strelitzaceae    | 1                | 1                 |
| 36  | Euphorbiaceae    | 2                | 2                 | 78    | Tamaricaceae     | 1                | 1                 |
| 37  | Fabaceae         | 14               | 16                | 79    | Tiliaceae        | 2                | 2                 |
| 38  | Geraniaceae      | 2                | 4                 | 80    | Tropaeolaceae    | 1                | 1                 |
| 39  | Iridaceae        | 3                | 4                 | 81    | Ulmaceae         | 1                | 1                 |
| 40  | Juglandaceae     | 1                | 1                 | 82    | Urticaceae       | 1                | 1                 |
| 41  | Lamiaceae        | 5                | 8                 | 83    | Verbenaceae      | 5                | 5                 |
| 42  | Lauraceae        | 4                | 4                 | 84    | Vitaceae         | 1                | 2                 |
|     |                  |                  |                   | 85    | Zygophyllaceae   | 1                | 1                 |
|     |                  |                  |                   | Total |                  | 352              | 361               |

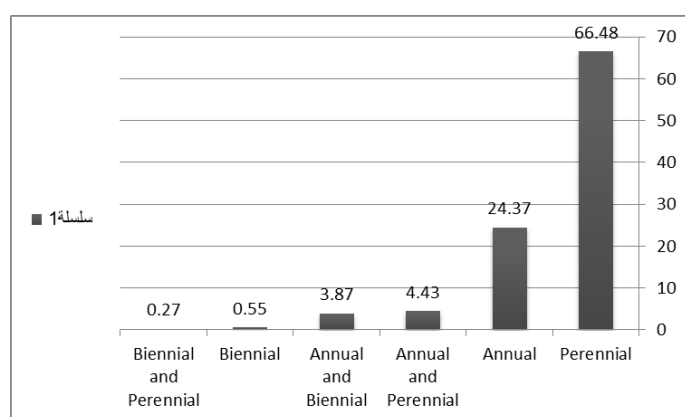
Six of the above-mentioned families belong to gymnosperms and the rest belong to angiosperms (Table 3).

**Table 3**

Classification of the introduced species of recorded in flora of Libya

| No. | Plant groups   | No. of Species | No. of Genera | No. of Families |
|-----|----------------|----------------|---------------|-----------------|
| 1   | Gymnosperms    | 3              | 3             | 3               |
| 2   | Angiosperms    | 358            | 250           | 86              |
| 3   | Dicotyledons   | 322            | 226           | 79              |
| 4   | Monocotyledons | 36             | 24            | 7               |
|     | <b>Total</b>   | <b>361</b>     | <b>253</b>    | <b>89</b>       |

The introduced species recorded in the flora of Libya belong to different life forms; 240 species are perennials (66.48%); 88 annuals (66.48%); 16 annuals and perennials (66.48%); 14 annuals and biennials (66.48%); 2 biennials (0.27%); and one is biennials and perennials (0.48%) (Fig. 1).



**Fig. 1.** Life forms of introduced species of recorded in flora of Libya

Most of the recorded species were deliberately introduced for different purpose such as reforestation (*Acacia nilotica* (L.) Delile., *Casuarina equisetifolia* Forst., *Eucalyptus gomphocephala* DC. Prodr., *Pinus canariensis* Sweet ex Sprengel.), food (*Amygdalus communis* L., *Momordica charantia* L., *Cucumis melo* L., *Allium sativum* L.) forage (*Sorghum sudanense* (Piper.) Stapf., *Medicago sativa* L., *Poa pratensis* L., *Brassica nigra* (L.) Koch.), ornamental (*Oxalis articulata* Savigny., *Hibiscus schizopetalus* (Mast.) Hook., *Datura arborea* L., *Myoporum serratum* R. Br. Prod), medicinal (*Tamarindus indica* L., *Salix babylonica* L., *Anethum graveolens* L. *Papaver somniferum* L., *Boehmeria nivea* (L.) Gaudich.), or multipurpose (*Vitex agnus-castus* L., *Melia azedarach* L., *Crocus sativus* L., *Nigella sativa* L., *Bombax ceiba* L.). Some of the recorded species accidentally introduced became invasive species such as weeds and were found to cause great losses for cultivated crops through competition with crops such as (*Cyperus alternifolius* L., *Senecio vulgaris* L., *Conyza canadensis* (L.) Cornq., *Silene gallica* L., *Euphorbia heterophylla* L.,

*Veronica persica* Poiret., *Cassia occidentalis* L., *Amaranthus retroflexus* L., *Raphanus raphanistrum* L., *Cenchrus incertus* M. A. Curtis., *Bidens pilosa* L. *Xanthium spinosum* L.) (Table 4).

**Table 4**

Purpose of the introduction of different species recorded in flora of Libya

| No. | Uses                           | Number of species |
|-----|--------------------------------|-------------------|
| 1   | Ornamental                     | 174               |
| 2   | Multipurpose                   | 35                |
| 3   | Food                           | 132               |
| 4   | Medicine                       | 27                |
| 5   | Extracting oil or aromatic oil | 19                |
| 6   | Forge for animal               | 10                |
| 7   | Weed                           | 11                |
| 8   | Wood                           | 10                |
| 9   | Fibers                         | 4                 |
| 10  | Chewing tobacco                | 2                 |
| 11  | Fuel hat                       | 1                 |
| 12  | Dye                            | 1                 |

Finally, this study revealed that the number of species, which may be considered as invasive species, is eleven species (about 3% of the total number of introduced plant species recorded in the flora of Libya, all these species are weeds.

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