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Potential Uses of Plant Species of the Coastal Mediterranean Region, Egypt

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Abstract: Two hundreds and thirty species belonging to forty eight families were recorded in the study area. The families of high representation are Compositae (17%), Leguminosae (11.4%), Gramineae and Chenopodiaceae (10.5 and 7.9% respectively). Sixty two percent of the studied species are common and about 24.9% are occasional, while 13% are rare. Sixty percent of the studied species are perennials (includes 1.8 and 12.7%, phanerophytes and geophytes, respectively) and 2.2% are biennials while, 40.2% are annuals. All rare and most of the occasional species and even some of the common ones are going to disappear as a result of over uses. Most of the studied species have multipurposes uses in our daily lives. For example, 89% of the studied species have medicinal value, 80% are used as forage (40% highly palatable species), 10.5% are edible for both human and birds, 16.6 are aromatic sources (42% have unpleasant smell) while, 31% are used as fuel wood and energy source. Eighty nine percent of the studied species have multi-ecological uses such as sand accumulation, windbreak, reducing the erosion, increase the fertility of soil, shading, as refuge for some plant species, salinity tolerant and save as microclimate effect. This type of study has the potential to provide guidance for developing appropriate management techniques for arid lands and for transferring, exchanging and propagating of multipurpose species to combat decertification in Egypt and arid land countries.

Key words: Coastal desert, natural vegetation, economic value, ecological value, refuge, folk medicine

INTRODUCTION

Many substances that we use in our daily lives are plant products. Numerous medicines were first isolated from species of seed plants, and in extracts of these plants. Many of the drugs and flavorings that are now synthesized in laboratories were originally discovered from plants. Many industrial products such as rubber, paint bases, non-petroleum oils, gums and sizing starches are also derived from seed plants. Most important of all, are the edible plant products that are the food base of human culture.

With improved communications accompanying economic development, higher birth rates and longer life expectancy, ever-increasing areas being opened up for commercial exploitation. The more valuable timber trees are removed and more land is brought under cultivation. The increased pressure on the land has often led to a reduction or even omission of the period under bush fallow. In the arid and semi-arid areas this can lead to accelerated decertification. In the higher rainfall areas, loss of land due to gulying becomes a problem on sloping lands, while in the level areas the removal of the trees can result in a rising water table and waterlogging^[1].

The utilization of browse and fodder plants by man is very much dependent upon availability, especially in relation to the presence or absence of more suitable alternative, including imported materials. The main uses

are for food, human and veterinary medicine, agriculture fuel, timber and domestic economy and, depending upon the area and economic standing, not necessarily in that order of priority. Each aspect will be discussed in turn.

Food and agriculture: The use of wild sources for food is, however extremely important in time of food scarcity and for the nomadic tribesmen or travelers. In general however, the food from wild sources is dependant upon the natural distribution of the plants concerned. Two main uses are well known in agriculture particularly for trees and shrubs: 1- to provide shade for plantation crops and 2- for the protection of crops generally by means of a live or dead fences Wickens^[2].

Trees and shrubs play many roles in agroforestry. Besides providing such useful products as fuel wood, fruits, edible seeds or beans, and fodder. They also minimize nutrient drain due to leaching and soil erosion, restore nutrients lost from the ecosystem, and perform other key environmental services. Plants that act as "living fences"; trees and shrubs can keep grazing animals out of crop areas. They serve as windbreaks or as shade trees in pastures and fields, thus helping to improve the microclimate so that animals and plants have better chances of survival. Trees with long tap roots for anchorage and wide- spreading lateral roots bind the soil and prevent erosion. Nitrogen-fixing trees also produce nitrates that can be recycled from decomposed leaves into

the cropping system a long with “pumped” nutrients. Ideal for many combined crops in the agroforestry systems are such leguminous trees as *Acaci* spp.

Human and veterinary medicine: The use of plants for treating various diseases in man and livestock are very important for nomadism and bedouin inhabitants. Some treatments may be of value, many are worthless. However, it is a subject that should only be discussed by those with appropriate medical and veterinary qualifications. Undoubtedly, the plant kingdom still holds many species of plants containing substances of medicinal value which have yet to be discovered. The wealth of uninvestigated material available is illustrated by the fact that in 1985, it was reported that natural product research elicited some 3500 new chemical structures of which more than 2600 were extracted from higher plants^[3]. Current estimates of the number of species of flowering plants range between 200,000 and 250,000 in some 300 families and 10,500 genera. Despite a rapidly expanding literature on phytochemistry, only a small percentage of the total species has been examined chemically, and there is a large field for future research^[3].

Table 1 shows some medicinal examples from the studied species that are considered a sources for medicine and pharmacological purposes^[4-13].

Fuel and timber: The majority of browse species are probably used as fuel in Arid and semi-arid region. In general breakdown of the bush fallow has created such a demand for fuel that the requirements from natural sources can only be met by cropping the trees to destruction within an ever-increasing radius from the center of habitation. Inevitably browse will suffer and stock will be forced to travel further. Alternative sources of fuel or firewood reserves are usually available for the established urban areas, but there is need for stronger awareness of the requirements of smaller settlements.

In general there are three major categories; pole timber for building frames, timber for local domestic uses (such as doors, furniture, boxes etc.), and commercial timber for mining, railway sleepers, bridge and wharf construction^[2].

Domestic economy: The multitude of uses to which browse species are subjected in the domestic affairs are very wide. This ranges from cordage, tanning, dyeing, soap making to toothbrushes, fish poisons, oils, and gums. Halophytes, either native or exotic, are liable to many different economic uses in land reclamation and rehabilitation: (grazing plantations as fodder reserves),

Table 1: Example of medicinal plant, used parts, effective constituent and their uses of the Mediterranean coast of Egypt

Species	Used part	Effective constituent	Medicinal use
<i>Alkanna tinctoria</i>	Leaves , roots	Glycosides	Used internally for ulcers
<i>Achillea santolina</i>	plant	Volatile oil	Plant reduce pain of toothache, Anthelmintic, stomachic
<i>Artemisia herba-alba</i>	Leaves, flowers	Oils, glycosides	Calmative for stomach, cough and calms the emotions, diuretic
<i>Sisymbrium irio.</i>	Seeds, leaves	Protein, oil, and fatty acids	A febrifuge, a stimulating poultice, asthma and fevers.
<i>Capparis spinosa</i>	Fruits	Glycosides and vitamins	Diuretic, astringent and folk medicine
<i>Chenopodium</i> sp.	Whole plant	Santonin and Ascaridol	Anthelmintic and expels worms
<i>Citrullus colocynthis</i>	Fruits	Colocynthin, Colocynthitin, Resins and Saponins	Purgative and Rheumatism treatment
<i>Datura stramonium</i>	Whole plant	Hyoscyamine, Hyscine and Meteloidine	Pain relief, hypnotic and Narcotic
<i>Dodonaea viscosa</i>	Roots and Leaves	Glycosides, Enzyme and Resins	Stimulate milk production and diarrhea
<i>Malva parviflora</i>	Seeds and leaves	Amino acids, malvic acid, a cyclopropenoid fatty acid	A demulcent in coughs, ulcer in the bladder, a nerve tonic and for wounds and swellings
<i>Peganum harmala</i>	Seeds	Red dye, alkaloids, harmine, harmaline and peganine	Antiperiodic, stimulant, as narcotic, emetic and emmenagogue, against tape worm, fevers
<i>Plantago ovata</i>	Above-ground, seeds	Fatty oil, glucosides, Asparagine, flavonoids	Astringent, relieve constipation and intestinal irritations.
<i>Artemisia herba-alba</i>	Leaves and flowering branches	Santonin, stigmasteryl flavone...	Calmaative for stomach, local antiseptic, antispasmodic and for ophthalmic diseases, widely used as anthelmintic in folk medicine.
<i>Tamarix aphylla</i>	Bark	Tannin	Astringent, tonic and eczema capitis
<i>Solanum nigrum</i>	Leaves and fruits	Solasodine and Saponins	Cortisone, Abdominal pains and aphrodisiac
<i>Zilla spinosa</i>	Root	Glycosides and Volatile oil	Expels kidney stone
<i>Ziziphus spina-christi</i>	Leaves and Fruits	Glycosides, Alkaloids and Tannins	Astringent and Anti-diarthoeic

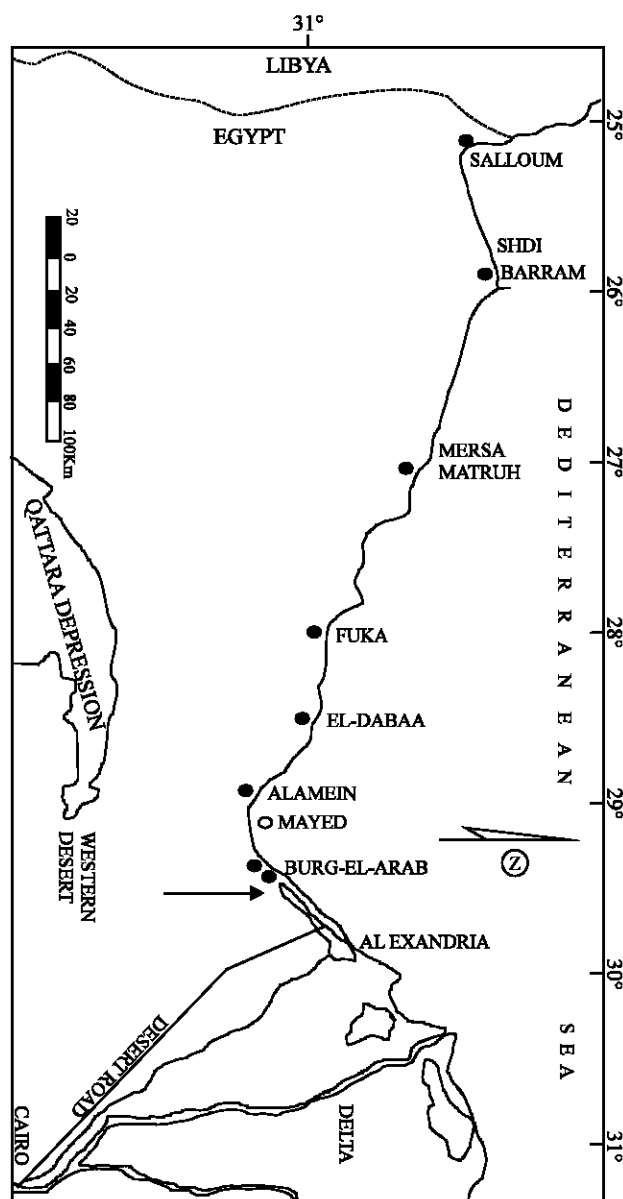


Fig. 1: Map of the western Mediterranean region of Egypt. The present study is the region between arrows

sand binding and sand dune stabilization, fuel plantations, amenity plantations, street and roadside trees, site protection around cities, villages, airports, in headwaters and watersheds, ground cover, hedging, gardening, low maintenance turfs and golf courses, windbreaks, beekeeping, and even timber production^[14-16]. The unrestricted use of roots for cordages, medicine, can however lead to the death of the tree.

These issues are very important for future researches and to conserve the ecosystem. Generally this study would help to transfer and exchange between this region

to other one in arid lands of germplasm of different life forms (trees, shrubs, forage, tubers, pulses, fruits and medicinal, salt and drought-tolerant plants), that could be introduced or reintroduce to combat decertification and/or to provide a source of income.

This study aims at: 1) reconnaissance of the species in the study area; 2) recording and listing their present and life forms; 3) collecting detailed information about the importance and role of the useful species in the region by field observation and questionnairing of inhabitants, and 4) address general questions about how knowledge of species role can contribute to local economy for sustainable development and conservation of natural resources.

MATERIALS AND METHODS

The study area: The western Mediterranean coastal region extends for about 500 km. From Alexandria to Sallum. The area is bounded on the north by the Mediterranean sea (Fig. 1). The region may be distinguished into two main physiographic provinces: an eastern province between Alexandria and Ras El Hikma, and the western province between Ras El Hikma and Sallum^[17]. The landscape is distinguished into a northern coastal plain and a southern tabeland. The coastal plain in the eastern province is wide and characterized by the presence of a number of alternating ridges and depressions. The ridge are formed of limestone with a hard crystallized crust, and vary in altitude and lithological features according to age. Nine ridges are recognized; the most prominent of which are the coastal, Abu-Sir and Gebel Mariut ridges. These ridges are dissected by numerous shallow erosional valleys, some of which end in the Mediterranean sea and others in depressions. The Western Mediterranean coastal belt is by far the richest part of Egypt in its floristic composition owing to its relatively high rainfall. The number of species in this belt makes up about 50% of the total of the Egyptian flora which is estimated to be about 2080 and more recently as about 2127 species^[18,19]. Most of these species are therophytes that flourish during the rainy season, giving the coastal belt a temporary showy grassland desert. During the longer dry period, only the characteristic woody shrubs and perennial herbs are evident; these constitute the scrub vegetation of the area, scattered sparsely in parts and grouped in denser more distinct patches in others.

Species collection and identification: Several locations in different habitats were taken to collect and identify the plant species. There were several visits to record most physiographic variations of the region and to represent all or most of species that occur in different sites through

Table 2: Wild plant species recorded in the coastal Mediterranean region, R,r =Rocky ridge, R.pl. = Rocky plateau, In. Fl. Pl. = Inland flat plateau, Cu. ar. = Cultivated area, Wa. = Wadi, DS.= Deep sandy, Sh.s. = Shallow soil

Species	Family	Life-form	Habitat	Abundance
<i>Achilla santolina</i> L.	Compositae	Ch.	Fl.Pl.Cu.area	Common
<i>Adonis dentata</i> Del	Ranunculaceae	Th.	S.Plain, Wa.	Common
<i>Aegialophia pumila</i> (Jusl) Boiss. **	Compositae	Ch.	Sand dune	Occasional
<i>Aegilops kotschy</i> Boiss.	Gramineae	Th.	Fl.Pl.Cu.area	Common
<i>Aegilops longissima</i> Schweinf. and Muscht **	Gramineae	Th.	Fl.Pl.Cu.area	Rare
<i>Aegilops ventricosa</i> Tausch **	Gramineae	Th.	Fl.Pl.Cu.Ar	Rare
<i>Aeluropus lagopoides</i> (L.) Trin.ex Thoates	Gramineae	Ch.	Sh. Salty soil	Common
<i>Aizoon canariense</i> L.	Aizoaceae	Th.	Sandy plains	Common
<i>Ajuga iva</i> (L.) Schreb. **	Labiatae	Geo.	Sh.s. Rocky rigde	Rare
<i>Alhagi graecorum</i> Boiss	Leguminosae	Ch.	Sandy Plains. road	Common
<i>Alkanna tinctoria</i> Tausch	Boraginaceae	Ch.	Fl. Pl. deep soil	Occasional
<i>Allium erdeii</i> Zucc. **	Alliaceae	Geo.	Deep sandy soil	Rare
<i>Allium roseum</i> L.	Alliaceae	Geo.	Deep sandy soil	Rare
<i>Amberboa lippii</i> (L.) DC	Compositae	Th.	Deep sandy soil	Rare
<i>Ammi visnaga</i> (L.) Lam.	Umbelliferae	Th.	Deep sandy soil	Common
<i>Ammophila arenaria</i> (L.) Link	Gramineae	Ch.	Sand dunes	Common
<i>Anabasis articulata</i> (Forssk.) Moq	Chenopodiaceae	Ch.	Sandy soil , R,r	Common
<i>Anabasis oropetiorum</i> Maire	Chenopodiaceae	Ch.	In. Fl. Pl.	Common
<i>Anacyclus alexandrinus</i> Willd	Compositae	Th.	Deep sandy soil	Occasional
<i>Anagalis arvensis</i> L. ***	Primulaceae	Th.	Cu. area	Common
<i>Anchusa azurea</i> Mill. **	Boraginaceae	Th.	Deep sandy soil	Rare
<i>Anthemis retusa</i> Del.	Compositae	Th.	Sandy soil, Wa.	Occasional
<i>Argyrolobium uniflorum</i> (Decne.) Jauband pach	Leguminosae	Ch.	Fl. Pl.	Rare
<i>Arisarum vulgare</i> Targ.-Tozz	Araceae	Geo.	DS. soil, water catch.	Common
<i>Aristida</i> sp.	Gramineae	Th.	DS. soil	Rare
<i>Arnebia hispidissima</i> (Lehm.) DC.	Boraginaceae	Th.	DS. inland plteau	Rare
<i>Artemisia herba-alba</i> (Del) Asso.	Compositae	Ch.	Sh. S.Soil, R,r.	Common
<i>Artemisia monosperma</i> Del.	Compositae	Ch.	DS. soil	Common
<i>Arthrocnemum glaucum</i>	Chenopodiaceae	Ch.	Salt marshes	Common
<i>Asparagus stipularis</i>	Liliaceae	Ch.	In. R. ridge	Rare
<i>Asparagus ophyllus</i> (L.) Forssk.	Liliaceae	Geo.	In. R. ridge	Rare
<i>Asphodelus ramosus</i> L.	Liliaceae	Geo.	DS.Soil, R,r, In. Pl	Common
<i>Asthenatherum forsskaolii</i> (Vahl) Neuski	Gramineae	Ch.	DS. soil, wadi	Rare
<i>Asteriscus hierochunticus</i> (Michon) Wiklund	Compositae	Th.	DS. soil, Fl. Pl.	Occasional
<i>Astragalus annularis</i> Forssk.	Leguminosae	Th.	DS. soil, Fl. Pl.	Occasional
<i>Astragalus hamosus</i> L.	Leguminosae	Th.	DS. soil, Fl. Pl.	Occasional
<i>Astragalus spinosus</i> (Forssk.) Muschl.	Leguminosae	Ch.	Sh.s. R,r, Road sides	Occasional
<i>Astragalus sieberi</i> DC. **	Leguminosae	Ch.	Sh. S. In.R.r.	Rare
<i>Astragalus caprinus</i> L.	Leguminosae	Ch.	Fl. Pl	Common
<i>Atractylis carduus</i> (Forssk.) Christens	Compositae	Ch.	Sandy soil, Fl. Pl	Rare
<i>Atriplex halimus</i> L.	Chenopodiaceae	Ph.	S. little saline, In Pl	Common
<i>Atriplex nummularia</i> Lindl.	Chenopodiaceae	Ph.	S. little saline, In Pl	Rare
<i>Atriplex semibaccata</i> R. Br.	Chenopodiaceae	Th.	S. little saline, R,r	Common
<i>Avena barbata</i> Pottex Link in Schard	Gramineae	Th.	Sh.s., R,r, Cu. area	Common
<i>Avena sativa</i> L.	Gramineae	Th.	Sh.s., R,r, Cu. area	Common
<i>Bassia indica</i> (Wight) A.J.	Chenopodiaceae	Th.	Road side	Common
<i>Bassia muricata</i> (L.) Asch.	Cruciferae	Th.	Sandy soil, Cu. area	Common
<i>Biscutella didyma</i> L.	Cruciferae	Th.	Sh.s., Fl. Pl.	Common
<i>Blepharis ciliaris</i> (L.) B.L. Burt.	Acanthaceae	Ch.	Sh. R,r Crevices	Occasional
<i>Brassica tournefortii</i> Gouan	Cruciferae	Th.	Sandy soil, Cu. area	Common
<i>Bromus rubens</i> Jusl.ap. L.	Gramineae	Th.	Sandy soil, Cu. area	Common
<i>Bupleurum semicompositum</i> L.	Umbelliferae	Th.	DS. Soil	Occasional
<i>Cakile maritima</i> Sacop.	Cruciferae	Th.	Sandy soil, Sand dunes	Common
<i>Calendula arvensis</i> L.	Compositae	Th.	Sandy soil, Fl. Pl.	Occasional
<i>Calligonum comosum</i> L.	Polygonaceae	Ch.	Rocky sandy soil	Occasional
<i>Caralluma retrospecticiens</i> (Ehrenb.) N.E.Br. **	Asclepiadaceae	Ch.	Rocky Plateau	Rare
<i>Carduncellus eriocephalus</i>	Compositae	Ch.	DS.Soil	Common
<i>Carrichtera annua</i> (L.) DC.	Cruciferae	Th.	Flat Plateau	Common
<i>Carthamus lanatus</i> L.	Compositae	Ch.	Flat Plateau	Common
<i>Capparis spinosa</i> L.	Capparaceae	Ch.	Rocky rdige slopes	Occasional
<i>Centaurea alexandrina</i> Delile	Compositae	Bi.	DS. Soil	Common
<i>Centaurea calcitrapa</i> L.	Compositae	Th.	Sandy Soil	Common
<i>Centaurea glomerata</i> Vahl	Compositae	Th.	DS.Soil	Common
<i>Chenopodium murale</i> L.	Chenopodiaceae	Th.	Sandy Cu. area	Common
<i>Chrysanthemum coronarium</i> L.	Compositae	Th.	Sandy flat plateau	Common

Table 2: (Continued)

Species	Family	Life-form	Habitat	Abundance
<i>Cistanche phelypaea</i> (L.) Cout. **	Orobanchaceae	Geo.	DS. Soil	Rare
<i>Citrullus colocynthis</i> (L.) Schrad.	Cucurbitaceae	Ch.	Ds.soil, wadi	Common
<i>Cleome amblyocarpa</i> Barratte andMu.	Cleomaceae	Ch.	Sandy soil	Rare
<i>Colchicum ritchi</i> R. Br.	Liliaceae	Ch.	Rocky Plateau	Rare *
<i>Convolvulus althaeoides</i> L. **	Convolvulaceae	Ch.	Sandy Cu. area	Common
<i>Convolvulus arvensis</i> L.	Convolvulaceae	Ch.	Sandy Cu. Area	Common
<i>Convolvulus lanatus</i> Vahl	Convolvulaceae	Ch.	Sandy soil, Wadi	Common
<i>Conyza linifolia</i> (Willd.) Täckh	Compositae	Th.	Sandy Cu. area	Common
<i>Cotula cinerea</i> Del.	Compositae	Th.	Sandy plains	Common
<i>Cressa cretica</i> L.	Convolvulaceae	Ch.	Sandy Plains	Occasional
<i>Crucianella maritima</i> L.	Rubiaceae	Ch.	Sandy soil (Sand dunes)	Common
<i>Cuscuta planiflora</i> Ten.	Cuscutaceae	Th.	Sandy soil (parasite)	Occasionally
<i>Cutandia dichotoma</i> (Forssk.) Trab.	Gramineae	Th.	DS soil	Common
<i>Cynodon dactylon</i> (L.) Pers.	Gramineae	Geo.	Sandy Cu. area	Common
<i>Cyperus rotundus</i> L.	Cyperaceae	Geo.	DS soil	Common
<i>Dactylis glomerata</i> L.	Gramineae	Geo.	Sandy Cu. area	Common
<i>Datura</i> sp.	Solanaceae	Th.	Sandy Plains	Occasional
<i>Daucus</i> sp.	Umbelliferae	Th.	DS soil	Occasional
<i>Didesmus aegyptius</i> (L.) Desv. **	Cruciferae	Th.	Sandy plains, Fl.Pl	Rare
<i>Diptaxis simplex</i> (L.) DC.	Cruciferae	Th.	DS soil	Occasional
<i>Ebenus armitgei</i> Schweinf. and Taub. **	Leguminosae	Ch.	Rocky ridge	Occasional
<i>Echinops spinosissimus</i> Turra.	Compositae	Ch.	Sandy plains, R. plateau	Common
<i>Echiochilon fruticosum</i> Desf	Boraginaceae	Ch.	DS soil	Common
<i>Echium sericeum</i> (Vahl) Klotz	Boraginaceae	Ch.	Sandy soil	Common
<i>Elymus farctus</i> (Viv.) Runernark ex	Gramineae	Geo.	Sand dunes	Common
<i>Emex spinosa</i> (L.) Campd.	Polygonaceae	Th.	Sandy plains, Cu.area	Common
<i>Eminium spiculatum</i> (Blume) Schott **	Araceae	Geo.	Shallow soil R. ridge	Rare
<i>Encarthrocarpus strangulatus</i> Boiss.	Cruciferae	Th.	Road side	Common
<i>Ephedra alata</i> Decne. **	Ephedraceae	Ch.	Sandy plains, R. plateau	Rare
<i>Erodium cicutarium</i> (L.) L'Hér.	Geraniaceae	Th.	DS soil	Common
<i>Erucaria pinnata</i> (Viv.) Tackh. and Boulos	Cruciferae	Th.	DS soil	Common
<i>Eryngium campestre</i> L. **	Umbelliferae	Ch.	Sandy soil	Occasional
<i>Euphorbia hierosolymitana</i> Boiss. **	Euophorbaceae	Ch.	Rocky ridge	Rare *
<i>Euphorbia granulata</i> Forssk. **	Euophorbaceae	Th.	Sandy soil, Cu. area	Common
<i>Euphorbia helioscopia</i> L.	Euophorbaceae	Th.	Sandy soil	Occasional
<i>Euphorbia paralias</i> L.	Euophorbaceae	Ch.	Sand dunes	Common
<i>Euphorbia pepilis</i> L.	Euophorbaceae	Th.	Sandy soil, Cu. area	Common
<i>Fagonia arabica</i> L.	Zygophyllaceae	Ch.	Sh. s. rocky plateau	Common
<i>Filago desertorum</i> Pomel	Compositae	Th.	Sh.. sandy places	Common
<i>Foeniculum vulgare</i> Mill.	Compositae	Ch.	Sh. S. sandy plateau	Common
<i>Frankenia revoluta</i> Forssk.	Frankeniaceae	Ch.	Salty places	Common
<i>Fumana thymifolia</i> (L.) Webb.	Fumariaceae	Ch.	Sandy soil	Occasional
<i>Fumaria parviflora</i> Lam.	Fumariaceae	Th.	Sandy soil	Occasional
<i>Gagea fibrosa</i> (Desf.)Schult. and Schu.	Liliaceae	Ch.	Rocky ridge	Rare
<i>Globularia arabica</i> Jaub. and Spach**	Globulariaceae	Ch.	Rocky ridge	Common*
<i>Gymnocarpus decander</i> Forssk.	Caryophyllaceae	Ch.	Sandy soil, R. r.,R. pl.	Common
<i>Halocnemum strobilaceum</i> (Pall.) M	Chenopodiaceae	Ch.	Salty places (salt marshes)	Common
<i>Haplophyllum tuberculatum</i> ¹ (Forssk.) Juss	Rutaceae	Ch. ¹	Compact soil, road sides	Common*
<i>Helianthemum kahiricum</i> Delile	Cistaceae	Ch.	R. ridge	Common
<i>Helianthemum lippü</i> (L.) DUM	Cistaceae	Ch.	Fl. Pl, R,r	Common
<i>Helianthemum stipulatum</i> (Forssk.) C. Chr.	Cistaceae	Ch.	Fl. Pl, R,r	Occasional
<i>Herinaria hemistemon</i> J. Gay **	Caryophyllaceae	Ch.	Sh.s.R.	Common
<i>Hippocrepis bicontorta</i> Loisel	Leguminosae	Th.	Sandy soil	Common
<i>Hippocrepis cyclocarpa</i> Murb.	Leguminosae	Th.	Sandy soil	Common
<i>Horidium murinum</i> L.	Gramineae	Th.	Sandy,Cu. soil	Common
<i>Hyoscyamus muticus</i> L.	Solanaceae	Ch.	Road sides	Common
<i>Hyoseris lucida</i> L. **	Compositae	Th.	Sand dunes	Occasional
<i>Hyoseris scarba</i> L.	Compositae	Th.	Sand dunes	Occasional
<i>Ifloga spicata</i> (Forssk.)Sch.	Compositae	Th.	Sandy places	Common
<i>Imperata cylindrica</i> (L.) Rausch.	Gramineae	Geo.	Cu. placea	Common
<i>Iris sisyriuchium</i> L.	Liliaceae	Geo.	Sandy places	Occasional
<i>Juncus acutus</i> L.	Junaceae	Geo.	Salt marsh	Common
<i>Juncus rigidus</i> Desf.	Junaceae	Geo.	Salt marsh	Common
<i>Kickxia aegyptiaca</i> (L.) Nabelek **	Scrophulariaceae	Ch.	Sandy soil	Occasional
<i>Lactuca serriola</i> L. **	Compositae	Bi.	Sandy soil	Occasional
<i>Lathyrus pseudocicera</i> Pamp.	Leguminosae	Th.	Sandy soil, Fl.Pl.	Occasional

Table 2: (Continued).

Species	Family	Life-form	Habitat	Abundance
<i>Launaea nudicaulis</i> (L.) Hook.	Compositae	Ch.	D. S. places	Common
<i>Launaea resedifolia</i> (L.) Kuntze	Compositae	Th.	D.S. places	Common
<i>Launaea tenuiloba</i> (Boiss.) Kuntze	Compositae	Th.	Sandy soil, Fl.Pl.	Occasional
<i>Leontodon hispidulus</i> Delile	Compositae	Th.	Sandy soil, Fl.Pl.	Common
<i>Limoniastrum monopetalum</i> (L.) Boiss.	Chenopodiaceae	Ch.	Salty places	Common
<i>Limonium tubiflorum</i> (Delile) Kuntze	Plumbaginaceae	Ch.	Sh. R.r	Common
<i>Linaria albifrons</i> (SM.) Spreng. **	Scrophulariaceae	Th.	Sandy soil, Fl.Pl	Rare
<i>Lobularia arabica</i> (Boiss.) Muschl.	Cruciferae	Th.	D.S. pleaces	Common
<i>Lobularia maritima</i> (L.) Desv. **	Cruciferae	Ch.	Shallow Soil	Common
<i>Lolium perenne</i> L.	Gramineae	Geo.	S. Cu. soil	Common
<i>Lotus creticus</i> L.	Leguminosae	Ch.	In. plateau	Common
<i>Lotus glaber</i> Mill., Gard. Dict.	Leguminosae	Ch.	Sandy soil, Fl.Pl	Common
<i>Lotus polyphyllus</i> E.D.	Leguminosae	Ch.	Sand dunes	Common
<i>Lycium europaeum</i> L.	Solanaceae	Ch.	Sandy soil, Fl.Pl	Common
<i>Lycium shawii</i> Roem.	Solanaceae	Ch.	Sandy soil	Common
<i>Lygeum spartum</i> Loeffl. ex L.	Gramineae	Geo.	Sand dunes, s.soil	Occasional
<i>Lygos rætam</i> (Forssk.) Heywood	Leguminosae	Ph.	Sand dunes, s.soil	Occasional
<i>Malva parviflora</i> L.	Malvaceae	Th.	S. soil, cu. places	Common
<i>Malva sylvestris</i> L.	Malvaceae	Th.	Sandy soil, Fl.Pl	Common
<i>Marrubium vulgare</i> L.	Labiatae	Ch.	Rocky plateau	Occasional
<i>Matthiola livida</i> (Delile) DC	Cruciferae	Th.	Fl. Pl.	Occasional
<i>Matthiola longipetala</i> (Vent.) DC.	Cruciferae	Th.	S. soil, Fl. Pl.	Common
<i>Medicago littoralis</i> Rhode ex Loisel.	Leguminosae	Th.	S. soil, Fl. Pl	Common
<i>Medicago polymorpha</i> L.	Leguminosae	Th.	S. soil, Fl. Pl	Common
<i>Medicago rigidula</i> (L.) All	Leguminosae	Th.	S. soil, Fl. Pl	Common
<i>Melilotus indicus</i> (L.) All.	Leguminosae	Th.	S. soil, cu. area	Common
<i>Molikiopsis ciliata</i> (Forssk.) I.M. **	Boraginaceae	Ch.	D. S. soil	Occasional
<i>Moricandia nitens</i> (Viv.) Dur. and Barr. **	Cruciferae	Ch.	Fl. Pl.	Rare
<i>Muscari racemosus</i> (L.) Mill. **	Liliaceae	Geo.	Ridge foot	Rare
<i>Narcissus tazetta</i> L.	Amaryllidaceae	Ch.	S. soil	Occasional
<i>Noaea mucronata</i> (Forssk.) Asch. and Sch	Chenopodiaceae	Ch.	S. soil, R. plateau	Common
<i>Onobrychis crista-galli</i> (L.) Lam.	Leguminosae	Th.	S. soil, road side, wadi	Occasional
<i>Ononis vaginialis</i> Vahl.	Leguminosae	Ch.	Sand dunes	Common
<i>Ononis serrata</i> Forssk.	Leguminosae	Th.	S. soil, sand dune	Common
<i>Onopordum alexandrinum</i> Boiss.	Compositae	Bi.	Road side	Common
<i>Ornithogalum trichophyllum</i> Boiss. and Hel.	Liliaceae	Ch.	Rocky ridge	Occasional
<i>Osteospermum vaillantii</i> (Decne.) Norl.	Compositae	Ch. ¹	Flat plateau	Occasional ¹
<i>Otanthus maritimus</i> (L.) Hoffmanns. and Link	Compositae	Ch.	Sand dunes	Occasional*
<i>Pancreatium maritimum</i> L. **	Amaryllidaceae	Geo.	Sand dunes	Common
<i>Pancreatium sickenbergeri</i> Asch. and Schweinf. **	Amaryllidaceae	Geo.	Sand dunes	Common
<i>Papaver rhoeas</i> L.	Papaveraceae	Th.	Flat plateau, Cu. area	Common
<i>Paronychia argentea</i> Lam. **	Caryophyllaceae	Ch.	Rocky plateau	Occasional
<i>Peganum harmala</i> L.	Zygophyllaceae	Ch.	S. soil, road sides	Common
<i>Phalaris minor</i> Retz.	Gramineae	Th.	S. soil, flat plateau	Common
<i>Phagnalon schweinfurthii</i> Sch. Bip.	Compositae	Ch.	Rocky ridge	Common
<i>Phlomis floccosa</i> D. **	Labiatae	Ch.	Rocky ridge	Occasional
<i>Phragmites australis</i> (Cav.) Trin. ex Steud.	Gramineae	Geo.	Salty places	Common
<i>Deverra tortuosa</i> (Desf.) DC.	Caryophyllaceae	Ch.	S. soil, flat plateau	Common
<i>Plantago albicans</i> L.	Plantaginaceae	Geo.	D. S. soil	Common
<i>Plantago crypsoides</i> Boiss.	Plantaginaceae	Th.	Rocky ridge	Common
<i>Plantago major</i> L.	Plantaginaceae	Ch.	Cu. area	Common
<i>Plantago ovata</i> Frossk.	Plantaginaceae	Th.	Flat plateau	Common
<i>Polygonum equisetiforme</i> Sm.	Polygonaceae	Ch.	Sh. Soil, road sides	Common
<i>Polygonum maritimum</i> L. **	Polygonaceae	Ch.	Wet, road side	Common
<i>Prasium majus</i> L. **	Labiatae	Ch.	Rocky criff	Rare
<i>Ranunculus bulbosus</i> L. **	Ranunculaceae	Geo.	Flat Plateau	Occasional
<i>Reichardia tingitana</i> (L.) Roeh.	Compositae	Th.	Flat Plateau	Occasional
<i>Reaumuria hirtella</i> Jaub. and Spach	Tamaricaceae	Ch.	Rocky plane	Common
<i>Reseda decursiva</i> Forssk.	Resedaceae	Bi.	S. soil, sand dune	Occasional
<i>Retama rætam</i> (Forssk.) Webb and Berthel	Leguminosae	Ch.	S. soil, flat plateau	Occasional
<i>Rostraria cristata</i> L.	Gramineae	Th.	S. soil, flat plateau	Common
<i>Rumex pictus</i> Forssk.	Polygonaceae	Th.	D.S. soil	Common
<i>Rumex vesicarius</i> L.	Polygonaceae	Th.	S. flat plateau	Common
<i>Salicornia fruticosa</i> (L.) L.	Chenopodiaceae	Ch.	Salt marsh	Common
<i>Salsola longifolia</i> Forssk.	Chenopodiaceae	Ch.	Salt marsh	Occasional
<i>Salsola tetragona</i> Delile	Chenopodiaceae	Ch.	Salty soil, F. plateau	Common

Table 2: (Continued)

Species	Family	Life-form	Habitat	Abundance
<i>Salsola tetrandra</i> Forssk.	Chenopodiaceae	Ch.	Salty soil, F plateau	Common
<i>Salsola volkensii</i> Schweinf. and Asch.	Chenopodiaceae	Ch.	Salty soil, F plateau	Occasional
<i>Salvia aegyptiaca</i> L.	Labiatae	Ch.	S. soil	Occasional
<i>Salvia lanigera</i> Poir.	Labiatae	Ch.	S. soil, sand dune	Common
<i>Schismus barbatus</i> (L.) Thell.	Gramineae	Th.	S. soil, flat plateau	Common
<i>Scorzonera undulata</i> Vahl	Compositae	Geo.	F., R. Plateau	Common
<i>Senecio vulgaris</i> L.	Compositae	Th.	S. soil	Common
<i>Silene villosa</i> Forssk.	Caryophyllaceae	Th.	S. soil	Occasional
<i>Silybum marianum</i> *** (L.) Gaertn.	Compositae	Ch.	S. soil, road side	Occasional
<i>Solanum nigrum</i> L.	Solanaceae	Th.	S. soil, Cu area	Common
<i>Stipa capensis</i> Thunb.	Gramineae	Th.	D. S. soil	Common
<i>Stipagrostis ciliata</i> (Desf.) de Winter	Gramineae	Geo.	D. S. soil	Common
<i>Suaeda pruinosa</i> Lange	Chenopodiaceae	Ch.	Salty soil	Common
<i>Suaeda vera</i> Forssk.	Chenopodiaceae	Ch.	Salty soil	Occasional
<i>Tamarix nilotica</i> (Ehrenb.) Bunge	Tamaricaceae	Ph.	Salty soil	Common
<i>Teucrium polium</i> L.	Labiatae	Ch.	Rocky ridge	Common
<i>Thymelaea hirsuta</i> (L.) Endl.	Thymelaeaceae	Ch.	Non-saline, R. ridge	Common
<i>Thymus capitatus</i> (L.) Link.	Labiatae	Ch.	Rocky ridge	Common*
<i>Tribulus terrestris</i> L.	Zygophyllaceae	Th.	Road side, Cu area	Common
<i>Trigonella stellata</i> Forssk.	Leguminosae	Th.	S. soil, Road side	Common
<i>Typha domingensis</i> (Pers) Poir. Ex Steud	Gramineae	Geo.	Wet, canal side	Common
<i>Urginea maritima</i> (L.) Baker	Liliaceae	Geo.	D.S. soil, Inland sand dunes	Common *
<i>Urginea undulata</i> (Desf.) Steinh. **	Liliaceae	Geo.	D.S. soil, flat plateau	Rare (group)
<i>Urtica urens</i> L.	Urticaceae	Ch.	S. soil, Cu. area,	Common
<i>Vaccaria hispanica</i> (Mill.) Rauschert. **	Caryophyllaceae	Th.	S. soil, non-saline	Occasional
<i>Valantia hispida</i> L.	Rubiaceae	Th.	Rocky ridge crevices	Common
<i>Varthemia candidans</i> (Delile) Boiss. **	Compositae	Ch.	Rocky ridge	Common
<i>Verbascum leitoumeurii</i> Asch. and Schw.	Scrophulariaceae	Bi.	Shallow soil, road side	Occasional
<i>Vicia monantha</i> Retz.	Leguminosae	Th.	Wet, Cu, area	Occasional
<i>Vicia sativa</i> L.	Leguminosae	Th.	Wet, Cu, area	Rare
<i>Xanthium spinosum</i> *** L.	Compositae	Th.	Wadi	Occasional
<i>Zilla spinosa</i> (L.) Prantl	Cruciferae	Ch.	Shallow soil, wadi side	Occasional
<i>Zygophyllum album</i> L.	Zygophyllaceae	Ch.	Shallow salty soil	Common

* Under stress of over uses, ** Endangered species and *** introduced species from Delta. Ch. = Chamaephytes, Geo. = Geophytes, Ph. = Phanerophytes, Th. = Therophytes, Bi. = Biennial, 1= Flowering during summer

this long period. Most of the visits were carried out during the growing seasons to be sure that the survey covering most of the plant species in the study area. Samples from the recorded species were collected and prepared as herbarium sheets for vouchers identification. Floristic identifications are according to Täckholm^[18] and the Latin names of species were updated following Boulos^[19]. Most of the voucher specimens have been deposited in the Botany Department Herbarium, Faculty of Science, Alexandria University, Egypt.

Several ways were used to get information about the economic or beneficial values of plant species during the field trip visits to the study area extended over 5 years, including: 1- direct observations in the field; 2- preparing questionnaire forms to the inhabitants (especially the eldest). Questionnaire was prepared in order to obtain information about fuel wood, traditional uses of some plant species for treatments; 3- benefit from the previous experience in the field of study; 4- marketing keeper for herbs.

Life biome of the collected species: Table 2 includes 230 species belonging to 48 families, and 159 genera. These species are related to 5 life forms: 45% of the species belonging to chamaephytes and phanerophytes (woody

species). The most dominant habitats are flat plateau, sandy plains and rocky ridges followed by salty places and wadis. Some of the plant species occur in road sides and close to cultivated areas. Sixty two percent of these species are common and about 37.9% are rare (includes 24.9% occasional). Sixty percent (includes biennial) of the studied species are perennials where about forty percent are annuals. The economic and ecological values of the studied species are represented in Table 3. This number of species represents a high percentage of the flora of norther coastal Mediterranean region. Family Compositae has the highest contribution in the studied species (17%) followed by Leguminosae (11.4%). The contribution of Gramineae and Chenopodiaceae are 10.5 and 7.9%, respectively. According to Täckholm^[18] the flora of the western Mediterranean desert of Egypt includes almost 50% of the species recorded in Egypt. Boulos^[19] reported that 2094 native and naturalized species in Egypt while Täckholm^[18] recorded that a very close figure to the 2080 species are belonging to 121 families and comprising 742 genera.

The composition of life-forms reflects the response of vegetation to variation in certain environmental factors. The life-form spectra is thought to be either hereditary

Table 3: List of most common species, economic and ecological values in the study area. 1= Sand accumulation, 2= Shading, 3= Windbreak, 4= Esthetic concerns, 5= Soil fertility, 6= Water storage, 7 = Refuge, 8 = Salinity tolerant, G= Grazing, ++ = Highly palatable, M= Medicinal, A = Aromatic source, +u = Unpleasant smell, E= Edible and F= Fuel

Species	Vernacular name	Economic value					Ecological value
		G.	M.	A	F.	E.	
<i>Achilla santolina</i>	Ba, tharaan	+	+	+	+	--	1,2,4
<i>Adonis dentata</i>	Nab el-gamal	+	+	+u	--	--	1,4
<i>Aegialophia pumila</i>	Oksh	+	+	--	+	--	1,4
<i>Aegilops kotschy</i>	Sha'eer el faar	++	+	--	+	--	1
<i>Aegilops longissima</i>	Sha'eer el faar	++	+	--	+	--	1
<i>Aegilops ventricosa</i>	Sha'eer el faar	++	+	--	+	--	1
<i>Aeluropus lagopoides</i>	Nigeel sheitanni	+	--	--	+	--	1,8
<i>Aizoon canariense</i>	Hadaq	--	+	--	--	--	1
<i>Ajuga iva</i>	Gaada	+	+	+	--	--	1
<i>Alhagi graecorum</i>	Aqool	++	+	--	+	--	1,3,5
<i>Alkanna tinctoria</i>	Hinna el -kole	+	+	--	+	--	1,3
<i>Allium erdelii</i>	Bassal	--	+	+u	--	+	6
<i>Allium roseum</i>	Bassal	--	+	+u	--	+	6
<i>Amberboa lippii</i>	Kheyzaraan	+	+	--	--	--	1,6
<i>Ammi visnaga</i>	Khilla	+	+	+	--	--	1
<i>Ammophila arenaria</i>	Jazzool	+	--	--	+	--	1,2,3
<i>Anabasis articulata</i>	El-agram	+	+	--	+	--	1,2,3,7
<i>Anabasis oropetiorum</i>	El-tafwa	++	+	--	+	--	1,2,3,7
<i>Anacyclus alexandrinus</i>	Sorret el-kabsh	++	--	--	+	--	1,3
<i>Anagalis arvensis</i>	Ain el-gamal	+	+	--	--	--	4
<i>Anchusa azurea</i>	Lisan el thour	+	--	--	--	--	1
<i>Anthemis retusa</i>	Folet nawaara	+	+	+	--	--	1,4
<i>Argyrolobium uniflorum</i>	Kood	++	+	--	+	--	1,2,3,5
<i>Arisarum vulgare</i>	Niriche	+	+	--	--	+	1,8
<i>Aristida sp.</i>	Abu-Rokba	++	+	--	--	--	1
<i>Arnebia hispidissima</i>	Attan	++	+	--	--	--	1,3
<i>Artemisia herba-alba</i>	Shih	++	+	+	+	+	1,2,3
<i>Artemisia monosperma</i>	Lel-lel	+	+	--	+	--	1,2,3,7
<i>Arthrocnemum glaucum</i>	Molah	+	+	--	+	--	1,2,3,7,8
<i>Asparagus stipularis</i>	Shook el-sooce	+	+	--	+	--	1,2,3,4,7
<i>Asparagus aphyllus.</i>	Aqool gabel	+	+	--	+	--	1,3,4
<i>Asphodelus ramosus</i>	Bassal el-onsol	++	+	--	+	--	1,2,3,4,6
<i>Asthenatherum forsskaolii</i>	Nigeel en-naga	++	+	--	--	--	1
<i>Asteriscus pygmaeus</i>	Lessaaq	++	+	--	--	--	1,4
<i>Asragalus annularis</i>	Mohallaq	++	+	--	--	--	1,5
<i>Astragalus hamosus</i>	Qorein	++	+	--	--	--	1,5
<i>Astragalus spinosus</i>	Kadaad	++	+	--	+	--	1,2,3,4,5,7
<i>Astragalus sieberi</i>	Shook en---ne'ag	++	+	--	--	--	1,2,3,4,5,7
<i>Astragalus alexandrinus</i>	El-krash	++	+	--	--	--	1,5
<i>Atractylis carduus</i>	Ain el-gamal	+	+	--	--	--	1,,5
<i>Atriplex halimus</i>	Qataf	+	+	--	+	--	1,2,3,7
<i>Atriplex nummularia</i>	Qataf	++	+	--	+	--	1,2,3,7
<i>Atriplex semibaccata</i>	Hawa	+	+	--	--	--	1,2
<i>Avena barbata</i>	Bohma	+	--	--	--	--	1
<i>Avena sativa</i>	Zommar	+	--	--	--	--	1
<i>Bassia indica</i>	Kohia	+	+	--	+	--	1,2
<i>Bassia muricata</i>	Ghobberia	+	+	--	+	--	1,2
<i>Blepharis ciliaris</i>	Shook el-daba'	+	+	--	--	--	1,4
<i>Biscutella didyma</i>	Halak	+	+	--	--	--	1
<i>Brassica tournefortii</i>	Shirtaam	+	+	+u	--	--	1
<i>Bromus rubens</i>	Thayl	++	+	--	--	--	1
<i>Bupleurum semicompositum</i>	Abu-za'reer	+	+	+	+	+	1,4
<i>Cakile maritima</i>	Figl el-gamal	+	+	+u	--	--	1,2,3,8
<i>Calendula arvensis</i>	Ain el-bkar	+	+	--	--	--	1,4
<i>Calligonum comosum</i>	Arata	+	+	--	+	--	1,2,3,7
<i>Caraluma retrospiciens</i>	Sabara	--	+	--	--	--	1,4,6
<i>Carduncellus eriocephalus</i>	Alhozan	+	+	--	--	--	1,2,4
<i>Carvichter a annua</i>	Qineybra	+	+	--	--	--	1
<i>Carthamus lanatus</i>	Shook antar	++	+	--	+	--	1,2,3,7
<i>Capparis spinosa.</i>	Kabaar	--	+	+	+	+	1,2,4,7
<i>Centaurea alexandrina</i>	Moraar	+	+	--	--	--	1,2
<i>Centaurea calcitrapa</i>	Moraar	+	+	--	--	--	1,2
<i>Centaurea glomerata</i>	Sorret enna'ga	++	+	--	--	--	1,2

Table 3: Continued

Species	Vernacular name	Economic value					Ecological value
		G.	M.	A	F.	E.	
<i>Chenopodium murale</i> .	Abu'efein	--	+	+u	--	--	1
<i>Chrysanthemum coronarium</i>	Oghowaan	--	+	+u	--	--	1,3
<i>Cistanche phelypaea</i>	Halook	--	+	--	--	--	1
<i>Citrullus colocynthis</i>	Hanadal	+	+	--	+	--	1,2,7
<i>Cleome amblyocarpa</i>	Shagaret Wahash	--	+	+u	+	--	1,2,3
<i>Colchicum ritchi</i>	Okna	--	+	--	--	--	1,4
<i>Convolvulus althaeoides</i>	Maddadah	+	+	--	--	--	1,4
<i>Convolvulus arvensis</i>	Olleiq	+	+	--	+	--	1,4
<i>Convolvulus lanatus</i>	Bayaad	++	+	--	+	--	1,2,3,4,7
<i>Conyza linifolia</i>	Nashash ed-dibbaan	+	+	--	+	--	1
<i>Cotula cinerea</i>	Ribyaan	+	--	--	+	--	1,3
<i>Cressa cretica</i>	Sabakh	--	+	--	+	--	1
<i>Crucianella maritima</i>	Hozzeil	--	+	--	--	--	1
<i>Cuscuta planiflora</i>	Hamool	--	+	--	--	--	1
<i>Cutandia dichotoma</i>	Neisy	++	--	--	--	--	1
<i>Cynodon dactylon</i>	Nigeel	++	+	--	+	--	1,2,7
<i>Cyperus rotundus</i>	Se'ed	+	+	--	--	--	1,7
<i>Dactylis glomerata</i>	Bahma	++	+	--	--	--	1,2,7
<i>Datura</i> sp.	Datoora	--	+	+u	--	--	1
<i>Daucus</i> sp.	Gezzerah	+	+	+	--	--	1
<i>Didesmus aegyptius</i>	Laslis	+	+	+u	--	+	4
<i>Diplotaxis simplex</i>	Yahaq	+	+	+u	--	+	1
<i>Eberus armitgei</i>	Legrena	++	+	--	--	--	1,2,3
<i>Echinops spinosissimus</i>	Qadaad	++	+	--	+	+	1,3,6,7
<i>Echiochilon fruticosum</i>	El-kohla	++	--	--	+	--	1,3,4,7
<i>Echium sericeum</i>	Hinna el-ghool	+	+	--	+	--	1,3,4,7
<i>Elymus farctus</i>	Neisy	+	--	--	--	--	1,3
<i>Emex spinosa</i>	Argat	+	+	--	--	+	1
<i>Eminium spiculatum</i>	Erqeit	--	+	--	--	--	1,6
<i>Encarthrocarpus strangulatus</i>	Shirtaam	+	+	+u	--	--	1,4
<i>Erucaria pinnata</i>	Seleih	+	+	+u	--	--	1
<i>Ephedra alata</i>	Alde el-dabbagh	--	+	--	--	--	1,2,3,4
<i>Erodium cicutarium</i>	Abu Mosfooh	+	+	--	--	--	1
<i>Eryngium campestre</i>	Shaqagool	--	+	--	--	--	1,4
<i>Euphorbia hierosolymitana</i>	Abu-laban	--	+	--	--	--	1
<i>Euphorbia granulata</i>	Abu-laban	--	+	--	--	--	1,4
<i>Euphorbia helioscopia</i>	Sa'ad	--	+	--	--	--	1
<i>Euphorbia paralias</i>	Libbeina	--	+	--	--	--	1
<i>Euphorbia pepilis</i>	Wideina	--	+	--	--	--	1
<i>Fagonia arabica</i>	Gamda	+	+	--	+	--	1
<i>Filago desertorum</i>	Lesaf	++	+	+	--	--	4
<i>Foeniculum vulgare</i>	Dathdath	+	+	+	--	--	1,3,4
<i>Frankenia revoluta</i>	Hemeisha	+	+	--	+	--	1,3,6
<i>Fumana thymifolia</i>	Osheb	--	+	--	--	--	1
<i>Fumaria parviflora</i>	Shatreq	+	+	--	--	--	1
<i>Gagea fibrosa</i>	Ze'atmaan	+	+	--	+	--	1,4
<i>Globularia arabica</i>	Zereiga	++	+	--	+	--	1,2,3,6,7
<i>Gymnocarpos decander</i>	El-Dashash	++	+	--	+	--	1,2,3,6,7
<i>Halocnemum strobilaceum</i>	Mola'h	+	+	--	--	--	1,3,7
<i>Haplophyllum tuberculatum</i>	Hab elreeh	--	+	+	+	--	1,3,4
<i>Helianthemum kahiricum</i>	Ra'al	++	+	--	+	--	1,3,4
<i>Helianthemum lippii</i>	El-aoda	++	+	--	+	--	1,3,4
<i>Helianthemum stipulatum</i>	El-aoda	++	+	--	+	--	1,3,4
<i>Herinaria hemistemon</i>	Alsophan	+	+	--	--	--	4
<i>Hippocrepis bicontorta</i>	Doreis	++	+	--	--	--	1,5
<i>Hippocrepis cyclocarpa</i>	Omm dawarah	++	+	--	--	--	1,5
<i>Horidium murinum</i>	Reesh	++	+	--	--	--	1
<i>Hyoscyamus muticus</i>	Sakaraan	--	+	+u	--	--	1,3,6
<i>Hyoseris lucida</i>	Hozan	+	+	--	--	--	1, 6
<i>Hyoseris scarba</i> .	Hozan	+	+	--	--	--	1,4
<i>Ifloga spicata</i>	Kreishit el-gadye	++	+	--	--	--	4
<i>Imperata cylindrica</i>	Halfa	++	+	--	--	--	1,3
<i>Iris sisyriuchium</i>	Zambaq	--	+	--	--	--	1,6
<i>Juncus acutus</i>	Samaar	+	--	--	--	--	1,3,8
<i>Juncus rigidus</i>	Samaar	+	--	--	--	--	3,8

Table 3: Continued

Species	Vernacular name	Economic value					Ecological value
		G.	M.	A.	F.	E.	
<i>Kickxia aegyptiaca</i>	Wedin el-faar	++	+	--	+	--	3,4
<i>Lactuca serriola</i>	Morrar	+	+	--	--	--	1
<i>Lathyrus pseudocicera</i>	Gilbaan	++	+	--	--	--	1,5
<i>Launaea tenuiloba</i>	Sileen	+	+	--	--	--	1
<i>Leontodon hispidulus</i>	Hawthaan	+	+	--	--	--	1
<i>Launaea nudicaulis</i>	El-Hozein	++	+	--	--	--	1,4
<i>Launaea resedifolia</i>	Morrar	++	+	--	--	--	1,3
<i>Limoniastrum monopetalum</i>	Zeita	--	+	--	+	--	1,3,6,7,8
<i>Limonium tubiflorum</i>	Bahman (ahmar)	+	+	--	+	--	1,3,4
<i>Linaria albifrons</i>	Halaawa	+	--	--	--	--	1,4
<i>Lobularia arabica</i>	Khorm el-ibra	++	+	--	--	--	1
<i>Lobularia maritima</i>	Khorm el-ibra	+	+	--	--	--	1
<i>Lolium perenne</i>	Gazoon	++	+	--	--	--	1
<i>Lotus creticus</i>	Le-qrana	++	+	--	--	--	1,5
<i>Lotus glaber</i>	Le-qrana	+	+	--	--	--	1,4,5
<i>Lotus polyphyllus</i>	Qam	+	+	--	--	--	1,3,5
<i>Lycium europaeum</i>	Awsage	++	+	--	+	+	1,2,3,5,6,7
<i>Lycium shawii</i>	Awsage	++	+	--	+	+	1,2,3,6,7
<i>Lygeum spartum</i>	Halfa	++	+	--	--	--	1,3,6
<i>Lygos raetam</i>	Ratam	--	+	--	+	--	1,2,3,5,7
<i>Malva parviflora</i>	Khobbeiza	++	+	--	--	+	1
<i>Malva sylvestris</i>	Khobbeiza	+	+	--	--	+	1
<i>Matthiola livida</i>	Shigaara	+	+	--	--	--	1
<i>Matthiola longipetala</i>	Mantoor	+	+	--	--	--	1,5
<i>Medicago littoralis</i>	Nafal	++	+	--	--	--	1,5
<i>Medicago polymorpha</i>	Oqqeil	++	+	--	--	--	1,5
<i>Medicago rigidula</i>	Nafal	++	+	--	--	--	1,3,5
<i>Marrubium vulgare</i>	Toam Elnaser	++	+	+	+	--	1,3
<i>Melilotus indicus</i>	Handaqqoq	+	+	--	--	--	1
<i>Molkiopsis ciliata</i>	Halama	+	+	--	+	--	1,3,4
<i>Moricandia nitens</i>	Rakhm	+	+	--	+	--	1,2
<i>Muscari racemosus</i>	Corma	--	+	--	--	--	3,6
<i>Narcissus tazetta</i>	Nargis	+	+	+	--	--	1,3,4
<i>Noaea mucronata</i>	Al-Igza	++	--	--	+	--	1,3,7
<i>Onobrychis crista-galli</i>	Silees	+	+	--	--	--	1,3,5
<i>Ononis vaginalis</i>	Hotteiba	+	+	--	+	--	1,2,3,4,5,7
<i>Ononis serrata</i>	Seita	+	+	--	--	--	1
<i>Onopordum alexandrinum</i>	Shoak el- Hanash	+	+	--	--	--	1,3
<i>Ornithogalum trichophyllum</i>	Basal el-Hanash	+	+	+u	--	--	1,4
<i>Osteospermum vaillantii</i>	Hama shabat	+	+	--	--	--	1,4
<i>Otanthus maritimus</i>	Shiba	+	+	--	--	--	1,3,4
<i>Pancratium maritimum</i>	Boseila	--	+	--	--	--	1,4
<i>Pancratium sickenbergeri</i>	Boseila	--	+	--	--	--	1,4
<i>Papaver rhoeas</i>	Zaghleel	--	+	--	--	--	1,4
<i>Paronychia argentea</i>	Bossat el-aed	++	+	--	--	--	1,4
<i>Peganum harmala</i>	El-Harmal	--	+	+u	--	--	1,3,4,6
<i>Phalaris minor</i>	Shaeer el-faar	++	--	--	--	--	1
<i>Phagnalon schweinfurthii</i>	Khanaanit	+	+	--	--	--	1,4
<i>Phlomis floccosa</i>	Dirsh esh-shaayib	+	+	--	+	--	1,3,4
<i>Phragmites australis</i>	Hagna	++	+	--	+	--	1,3,6
<i>Deverra tortuosa</i>	Qaseekh	++	+	+	+	+	1,3,4,6,7
<i>Plantago albicans</i>	Yanama	++	+	--	--	--	1,6
<i>Plantago crypsoides</i>	Masaas	++	+	--	--	--	1
<i>Plantago major</i>	Yenem	++	+	--	--	--	1,4
<i>Plantago ovata</i>	Geneima	++	+	+	--	--	1
<i>Polygonum equisetiforme</i>	Qordaab	++	+	+	--	+	1,4
<i>Polygonum maritimum</i>	Qordaab	+	+	--	--	--	1
<i>Prasium majus</i>	Shoofal	++	+	+	+	--	1,3,7
<i>Ranunculus bulbosus</i>	Drana	--	+	--	--	--	1
<i>Reichardia tingitana</i>	Noqod	+	+	--	--	--	1,4
<i>Reaumuria hirtella</i>	Omm en-nada	--	+	--	--	--	1,3,6
<i>Reseda decursiva</i>	Rigl el-ghoraab	+	+	--	--	--	1
<i>Retama raetam</i>	Ratam	--	+	--	+	--	1,2,3,5,7
<i>Rostraria cristata</i>	Hasheesh	++	--	--	--	--	1
<i>Rumex pictus</i>	Harnsees	++	+	--	--	+	1,6

Table 3: Continued

Species	Vernacular name	Economic value					Ecological value
		G.	M.	A.	F.	E.	
<i>Rumex vesicarius</i>	Hambeit	++	+	--	--	+	1,6
<i>Salicornia fruticosa</i>	Boo-saaq	--	--	--	--	--	1,3,6,8
<i>Salsola longifolia</i>	Heddeid	+	+	--	--	--	1,3,6,8
<i>Salsola tetragona</i>	Geel	++	+	--	+	--	1,3,6,8
<i>Salsola tetrandra</i>	Arad	+	+	--	--	--	1,3,6,8
<i>Salsola volkensis</i>	Areyneba	+	+	--	--	--	1,8
<i>Salvia aegyptiaca</i>	Ra'alah	++	+	+	+	--	1,3,4
<i>Salvia lanigera</i>	Thaalaba	++	+	+	--	--	1,3,4
<i>Schismus barbatus</i>	Bahma	++	+	--	--	--	1
<i>Scorzonera undulata</i>	Dabbah	++	+	--	--	+	1,4,6
<i>Senecio vulgaris</i>	Morrrar	+	+	--	--	--	1
<i>Silene villosa</i>	Attaan	--	+	--	--	--	1
<i>Silybum marianum</i>	Shoak sinnaari	+	+	--	--	+	1,3,6,7
<i>Solanum nigrum</i>	Anab ed-deeb	--	+	--	--	+	1
<i>Stipa capensis</i>	Sabat	++	--	--	--	--	1
<i>Stipagrostis ciliata</i>	Assahn	++	--	--	--	--	1
<i>Suaeda pruinosa</i>	Soweid	+	+	--	+	--	1,3,6
<i>Suaeda vera</i>	Sabtah	--	+	--	--	--	1,3,6,8
<i>Tamarix nilotica</i>	Atl	+	+	--	+	--	1,3,6,7
<i>Teucrium polium</i>	Toam Nasser	+	+	+	--	--	1,8
<i>Thymelaea hirsuta</i>	Mitnaan	+	+	--	+	--	1,2,3,7
<i>Thymus capitatus</i>	Za'tar	+	+	+	+	+	1,3,4
<i>Tribulus terrestris</i>	Dreiss	+	+	--	--	--	1
<i>Trigoneilla stellata</i>	Shetn el-khaadem	++	+	+	--	--	1,3
<i>Typha domingensis</i>	Bordi	--	--	--	+	--	1,3,8
<i>Urginea maritima</i>	Basal Far'aon	--	+	--	--	--	1,2,4,7
<i>Urginea undulata</i>	Basal abide	--	+	--	--	--	1,6
<i>Urtica urens</i>	Horraqa	--	--	--	--	--	1
<i>Vaccaria hispanica</i>	Foolm el-arab	+	--	--	--	--	1
<i>Valantia hispida</i>	Hasha	--	--	--	--	--	1
<i>Varthemia candicans</i>	Za'atr el-hoomar	+	+	--	--	--	1,4
<i>Verbascum leucomeurii</i>	Haab el-reeh	+	+	--	--	--	1,4
<i>Vicia monantha</i>	Khareeg	++	+	--	--	+	1
<i>Vicia sativa</i>	Fool roomi	++	+	--	--	+	5
<i>Xanthium spinosum</i>	Shobbeit	--	--	--	--	--	1
<i>Zilla spinosa</i>	Silla	+	+	--	+	--	1,2,3
<i>Zygophyllum album</i>	Ratrayt	--	+	--	--	--	1,3,6,8

adjustment to environment^[20], or represent the residual effects of some historical, climatic or biotic condition on the population of the plant^[21]. In this study, chamaephytes are the most frequent life-form in the study area (43%), followed by therophytes (40.2%), geophytes (13%), biennials (2.2%) and phanerophytes (1.8%). The dominance of both chamaephytes and therophytes over the other life-forms in the study area would seem to be a response to the hot dry climate, topographic variations and biotic influence. This agrees with the results obtained by El-Demerdash *et al.*^[22] in the southern region of Saudi Arabia.

Economic and ecological values: In countries having large areas of deserts, like Egypt, the limited number of species, whose habitats are generally at risk, is a better reason for enumeration, description, and conservation. This is because desert plants are hardy and have developed over millennia adaptational mechanisms, including the production of a host of secondary metabolites, to protect

themselves from physical and biotic aggressions. These metabolites are the stuff of the medicinal uses of these plants. Conservation of desert plants for medicinal uses is therefore a must and requires a through knowledge of their morphology, taxonomy, ecology, physiology and biochemistry^[19].

There is a shortage of information about the multipurpose uses of natural species. Many substances that we use in our daily lives are plant products. Although there are a lot of uses of plant species still unknown. Numerous medicines, many industrial products are derived from plant products. Most of all are the edible plant products that form the food base of human culture.

This work is a preliminary study and it deals with the economic values of natural resources especially plant species. Economic values are classified as medicinal, aromatic (e.g. used in perfumery), forage, edible or as fuel. On the other hand, the ecological value of the plants in desert ecosystem includes (sand accumulation, shading, esthetic concerns, soil fertility, windbreak. It also serves

as refuge for some plant species particularly the rare species (e.g. *Didesmus aegyptius*, *Rumex vesicarius* and *Valantia hispida*). This may be conceive the biodiversity of the species and for water storage. Information about the multi-uses of plant species in this study mainly depends on the actual observation and the main sources are herders, house hold managers, farmers and marketing men. Most of the plant species have a medicinal and or grazing value^[23-25]. Eighty nine percent of the species in the present study have a medicinal value as extracted or direct herb (e.g. folk medicine for skin diseases, gastro-intestinal troubles, sedative for cough, fever, diuretic, dysentery, and purgative effects) and 80% of them as forage (40% of them highly palatable plant species) for the livestock (Table 2). About 10.5% of the species are edible by human and birds, 16.6% are aromatic sources while, more than 31% are used as fuel wood. More than 89% of the studied species have multi-ecological uses, beside other uses such as nitrogen fixation, refuge for weak plants species, salinity tolerant, purification of the air and microclimate effects. Table 4 illustrated multi-uses of some studied species.

On the other side, it is possible to summarized the results of economic and ecological values as percentages in the following Table:

Economic value (%)		Ecological value (%)										
G.	A.	E.	F.	S.	Sh.	W.	Es.	So.	Wa.	R.	Sa.	
80	89	16.6	10.5	31	96	17.9	36.2	27.9	10.4	14.8	15.7	7.4

G. = Grazing value, M. = Medicinal value, A. = Aromatic resources, E.= Edible, F. = Fuel wood, S.= Sand accumulation, Sh.= Shading, W.= Windbreak, Es.= Esthetic concerns, So.= Soil fertility, Wa.= Water storage, R.=Refuge, Sa.=Salinity

Destructive exploitation is something justified on the basis of a philosophical belief that man has a God-given right^[31] to have dominion over the land and animals there

in. When tribal or familial rights to overuse fodder trees and shrubs for various purposes are not questioned, problems are created for future generations by narrowing the margin of safety for maintaining this renewable natural resource. When multiple use can be justified and managed, it should be encouraged because the additional uses help to better justify or support the principal use. Greatest returns to the communities that depend on plants for a livelihood can be realized if multiple use management is practiced on a sustained yield basis.

The main contributions of ligneous species to the lives of people and animals in the Coastal Mediterranean region are: a) to supply animals with the protein, minerals and vitamins necessary in a well-balanced diet for the flocks and herds, which must survive in dry season; b) to produce firewood and charcoal, c) to supply wood for building and fencing; d) to produce wood and fibre for making tools and utensils; e) to produce fibres for clothing, wickerwork, rope and other uses; f) to produce various foodstuffs for human consumption (fruit, spices, fat, etc); g) to produce medicines, dyes, tannin and other materials; h) to provide shade and act as a micro-climate for plants, animals and soils and to prevent wind and water erosion; I) to provide a means of increasing or maintaining soil fertility and productivity and the long-term balance of highly sensitive ecosystems.

Forage trees and shrubs play an essential and multiple role in the balance of the arid and semi-arid grazing systems exploited by man and his animals. This role becomes more important especially in the dry seasons^[26,27]. However, shrubs and sub-shrubs are seriously threatened, especially in coastal habitats, owing to the combination of a number of natural and anthropogenic factors: such as a) periodic droughts; b) the fast growth of human and animal populations, leading to over exploitation; c) the development of

Table 4: Some plant species and their uses

Species	Uses			
<i>Echium sericeum</i>	Fixation of mobile sand	Pink flowers used in flower beds	Occasionally grazed	Pigments used as a dye (Henna)
<i>Anabasis oropetiorum</i>	Protect against wind, and as refuge of weak species	Accumulation of sand and building of phytogenic hummocks	Highly palatable for the livestock	Water storage and Fuel wood
<i>Atriplex halimus</i>	Wide range of salt tolerant	Wind binder, sand accumulation, and as refuge of weak species	Highly palatable (Young branches) alkaline salts taken with	Roots used as toothbrush, Ash of plant is rich in water for gastric acidity.
<i>Helianthemum lippii</i>	Winbreak, Sand accumulation	Fuel-wood	Highly palatable	The main host for <i>Trefezia</i> pp. Edible fungi of very high economic value
<i>Silybum marianum</i>	Sand accumulation	Protection for some plant species	Inflorescence highly palatable for camels, Inflorescence very edible for Bedouin.	Tonic, febrifuge, seed used for liver disorders, congestion of uterus and varicose veins

development of bush-clearing and the fast growing expansion of cultivated areas; d) the tendency of previously nomadic or transhumant populations to become sedentary leading to a constantly increasing pressure by man and his animals etc.

The various activities have different impacts. Generally speaking, crop expansion, overgrazing, and firewood collection are the most harmful, and are responsible for 80 % or more of the havoc^[28]. In the study area, 37 species rated as endangered species due to human impact or decertification (7 species urgently needed to prevent overuses by human) comparing with 10 species were recorded in the Omayed observatory area^[29]. On the other hand, due to unmanagement of the land used 3 species were recorded as exotic (introduced) from cultivated region (Delta).

There are direct and indirect causes for ecosystem degradation and species impoverishment in the study area. The direct causes are related mainly to the ways in which man has used and misused the natural resources since its early history. More recent, land use activities are even more devastating^[30]. Evaluation of the effects of the environmental factors threatening the wild life should be also taken in consideration.

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