

Chapter Three

Wild Plants Used in Folk Medicine

There are numerous plant species which are collected from their natural habitats to be sold in the “*Attarin*” or the herb’s seller shops. This practice has been adopted since immemorial times. The long list of plants and drugs obtained from them is given by numerous scholars as **Ibn Sina** “Avicenna”, **Ibn El Beitar**, **El Baironi**, **Al Antaki**, **Al Mo’tamed** and many others. It is interesting to mention that these books give the names of the plants in different languages, its geographical distribution, its habitat, its growth form, the part used in medicine, how it is used, how it is stored, how it is used as a single drug or a compound with other drugs, and its effect on the different organs of the body.

The great surge of public interest in the use of plants, as well as some animal products as medicine is based on the assumption that the plants will be available on a continuing basis. However, no concerted effort has been made to ensure this in the face of the threats posed by the increasing demand of vastly increasing human population and extensive destruction of plant rich habitats.

The continuous use of these plants impose a considerable pressure on the naturally growing plants in the deserts and semi-deserts of the region. In such habitats, the rate of exploitation is more than the rate of establishment of new individuals under the harsh environment of the desert. Therefore, it is expected that many of these plants are endangered. One notes that little attention has been paid to the socio-economic and conservation aspects of medicinal plant resources. This is probably due to the relatively small volume involved and the specialist nature of the informal trade in these plants. However, there is a great need to possess information on these plants to help the assessment of the economic value of them and manage their traditional use.

Monographs of the wild plants used in folk medicine are given below.

1. Acacia nilotica (L.) Delile Descr. Egypte, Hist. Nat. 79 (1814)
Mimosa nilotica L., Sp. Pl., ed. 1, 521 (1753).

Arabic : *Sant*

اٲٲٲ

Fruit: Qarad

u t?

English : Egyptian Acacia, Egyptian Thorn

French : Acacia d' Egypte, Gommier d Egypte

German : Aegyptische Akazie

This has been known since the greek times as the Egyptian akakia

(**Arabic :** *Aschawkah Al misriyah*)

(**English:** Egyptian thorn)

Morphological Description

Tree, 2.5-14 m high; bark on trunk tough, fissured blackish grey or brown, powdery and peeling; young branches from almost glabrous to subtomentose; stipules spinescent up to 8 cm long, straight or almost so often deflexed. Leaves, up to 7.5 cm long, with 2-11 pairs of pinnae, often with 1 or 2 petiolar glands and others between all or only the topmost of the pairs of pinnae, leaflets 7-25 pairs, 1.5-7 mm long, 0.5-1.5 mm wide, glabrous to pubescent. Flowers, bright yellow in axillary heads, 6-15 mm in diameter; peduncle, 1-3 cm long. Calyx, 1-2 mm long, subglabrous to pubescent. Corolla, 2.5-3.5 mm long, glabrous to pubescent outside. Pod, indehiscent lomentum, constricted between the seeds, straight or curved, glabrous to grey-velvety, 8-17 cm long, 1.3-2 cm wide. Seeds, deep blackish-brown, smooth, subcircular, compressed, 7-9 mm long, 6-7 mm wide (Plate 17).

Ecology :

The plant grows on the banks of the canals crossing the Delta and the Nile Valley (Plate 17). It was cultivated in some cases. However, its cultivation is stopped. The relicts of this species are occasionally seen along the canals near the River Nile.

Distribution:

Local : The Nile Delta, Nile Valley, Oases, Sinai and Western Desert.

Regional : Egypt

Global : Egypt, Sudan and some Nile basin countries. However, there are different subspecies which occur in different countries as India, Senegal, Kenya, and Tanzania. Some of these subspecies are used in afforestation in the desert areas in the Arab Gulf countries, e.,g. *A. nilotica* subsp. *indica* in Qatar.

Status :

The *Acacia* groves growing in the Nile region in Egypt were replaced since many centuries by the date palm groves. Despite this, the tree was reputed for its value as a source for the agricultural tools as the hoe, the plough, ..etc. Due to the introduction of the mechanisation of agriculture, the plant was neglected. Also, due to the need of the land occupied by the trees, they were fell down. Nowadays, the tree is not as common as before. It could be considered as endangered, especially it does not grow in many countries.

Part Used :

The fruits, the bark and the leaves.

Constituents :

a- The fruits : They contain high percentage of phenolic constituents, which consist of : m-digallic acid, gallic acid, its methyl and ethyl esters, protocatechuic and ellagic acids, leucocyanidin, m-digallic dimer 3, 4, 5, 7-tetrahydroxy flavan-3-ol, oligomer 3, 4, 7-trihydroxy flavan 3, 4-diol and 3, 4, 5, 7-tetrahydroxy flavan-3-ol, and (-) epicatechol. The fruits contain also: mucilage, and, saponins.

b- The bark : It is rich in phenolics consisting of condensed tannin and phlobatannin, gallic acid, protocatechuic acid pyrocatechol, (+) - catechin, (-) epigallocatechin-7-gallate, and (-) epigallocatechin-5, 7-digallate.

c- The leaf : It contains apigenin, 6-8-bis-D-glucoside, and rutin.

Folk Medicinal Uses :

The fruits are given for diarrhoea, haemorrhage, as sedative in labour, as a cure for sore gum and loose teeth and for diabetes by taking a teaspoonful before breakfast. The leaflets are chewed for nausea.

Pharmacological Activity:

- Acetone, alcohol and aqueous extracts of fruits and stem bark showed molluscicidal activity against *Bullinus truncatus* and *Biomphalaria pfeifferi*, the two snail hosts of Schistosoma.
- Extract of the bark showed antigonococcal activity as examined *in vitro* by filter paper assay method.
- Antihyperglycaemic activity.
- Stimulation of rat's uterus at different stages of sex cycle.
- ✍ Antimicrobial activity.
- ✍ Extract of *A.nilotica* blocked platelet aggregation in a dose-dependent manner using different agents. The antiplatelet aggregatory activity is mainly due to blockade of Ca²⁺ channels.
- ✍ *Acacia nilotica* extract showed an inhibitory effect on carrageenan induced paw edema and yeast-induced pyrexia in rats. It also produced a significant increase in the hot plate reaction time in mice. Analgesic and antipyretic activities may be attributed to the phenolic constituents present.
- ✍ Antimicrobial and molluscicidal activities had been ascribed to extracts of the plant.

Economic Potential :

The plant is of economic importance, due to its high content of polyphenolics to which the molluscicidal activity and tanning properties are attributed.

References :

1. Abd-el-Nabi, O.M.; Reisinger, E.C.; Reinthaler, F.F.; Still, F.; Eibel, U. and Kreis, G.J. 1992. Antimicrobial activity of *Acacia nilotica* (L.) Willd. ex Del. var. *nilotica* (Mimosaceae). J. Ethnopharmacol. **37**(1): 77-79.
2. Abdelwahab, S.M.; Wassel, G.M.; Aboutabl, E.A.; Ammar, N.; El-Fiki, N. and Afifi, M.S. 1990. The saponin content of *Acacia nilotica* (L.) Willd. Bull. Fac. Pharm., Cairo Univ. **28**(1): 87-90.
3. Abdelwahab, S.M.; Wassel, G.M.; Aboutabl, E.A.; Ammar, N.M. and Afifi, M.S. 1992. Investigation of mucilage of the pods of *Acacia nilotica* (L.) Willd and *Acacia farnesiana* (L.) Willd growing in Egypt. Egypt. J. Pharm. Sci. **33**(1-2): 319-325.

4. Adeweye, R.O. and Rao, J.B. 1977-1978. *Leather Sci.* **24**(9): 293-301 (1977); through C.A. **89**:87172s (1978).
5. Afifi, M.S. 1988. Pharmacognostical study of certain *Acacia* species growing in Egypt. Master Thesis (Pharmacognosy), Faculty of Pharmacy, Cairo University.
6. Dafallah, A.A. and Al-Mustafa, Z. 1996. Investigation of the antiinflammatory activity of *Acacia nilotica* and *Hibiscus sabdariffa* *Am. J. Clin. Med.* **24**(3-4): 263-926.
7. El-Sissi, H.I.; Sissi, A.A.; Ishak, M.S. and Sherbieny, A.A. 1967. *Leder* **2**(18): 32-5 (1967), through C.A. **67**: 37. 1969.
8. El-Sissi, H.I.; Sissi, A.A.; Ishak, M.S. and Sherbieny, A.A. 1975. **30**(11): 736-743.
9. Hussein-Ayoub, S.M. 1985. Molluscicidal properties of *Acacia nilotica* subspecies *tomentosa* and *astringens*. *J. Trop. Med. Hyg.* **88**(3):197-199.
10. Saayman, H.M. and Raux, D.G. 1965. *Biochem. J.* **97**(3): 794-801.
11. Shah, B.H.; Safdar, B.; Virani, S.S.; Nawaz, Z.; Saeed, S.A. and Gilani, A.H. 1997. The antiplatelet aggregatory activity of *Acacia nilotica* is due to blockade of calcium influx through membrane calcium channels *Gen. Pharmacol.* **29**(2): 251-255.
12. Thieme, H. and Khogali, A. 1974. *Pharmazie.* **29**: 352.
13. Wassel, G.M.; Abdelwahab, S.M.; Aboutabl, E.A.; Ammar, N.M. and Afifi, M.S. 1990. Study of phenolic constituents and tannins isolated from *Acacia nilotica* (L.) Willd and *Acacia farnesiana* (L.) Willd growing in Egypt. *Herba Hungarica.* **29**(1,2): 43-49.
14. Wassel, G.M.; Abdelwahab, S.M.; Aboutabl, E.A.; Ammar, N.M. and Afifi, M.S. 1992. Phytochemical examination and biological studies of *Acacia nilotica* (L.) Willd and *Acacia farnesiana* (L.) Willd growing in Egypt. *Egypt. J. Pharm. Sci.* **33**(1-2): 327-340.

2. Achillea fragrantissima (Forssk.) Sch. Bip., Flora
(Regensburg) 38:13 (1855).

Santolina fragrantissima Forssk., Fl. Aegypt.-Arab. 147 (1775).

Arabic :	<i>Qaysûm</i>	??Uf?
	<i>Baatharaan</i>	?QESf
	<i>Bu'aythiran</i>	?QESf
	<i>Gesoom, Gesoum</i>	??US
	<i>Gesoom gebeli</i>	NgU ?S ??US

English : Lavender Cotton

French : Garde-robe, Aurone femelle, Santoline.

Italian : Cypressengarbe.

Turkish : Guarda roba, Santolina.
Sarvi otic, Kara-pelin otu.

Morphological Description :

Plants are white-wooly, with erect stems which attain up to 1m high. Leaves small, exstipulate, thick, white to greyish-green, oblong, serrate with undivided lamina. Flower heads, terminal discoid composed of numerous tubular florets with golden-yellow colour. Odour is aromatic and the taste is bitter (Plate 18).

Ecology :

The plant grows in the limestone wadis of the north eastern desert and Sinai.

Distribution :

Local : The eastern desert, Red Sea region, Sinai Oases.

Regional : Egypt.

Global : The Arabian Peninsula.

Status :

The plant is overexploited by collection for folk medicinal uses. It seems that the rate of exploitation exceeds that of regeneration. The plant could be considered endangered.

Part used :

Fresh or dry whole plant.

Constituents :

The fresh herb contains volatile oil that reaches about 1.0%, which consists of 59 components of which α -pinene, β -pinene, limonene, 1,8-cineole, linalool, carvacrol, eugenol, artemesia ketone, palustrol, sabinene hydrate, γ - and δ -thujones, santolina alcohol and α -terpineol. Its tannin content reaches 8%. It is composed of resorcin, phloroglucin, methyl phloroglucin and pyrocatechol.

It contains, flavonoids, from which afroside, cirsimartin, chrysoplenol and cirsiliol were identified, also the fatty acids: lauric, myristic, palmitic, stearic, linoleic, linolenic and oleic, as well as a bitter substance named keissoside. Sesquiterpene lactones: 13-O-desacetyl-1- β -hydroxyafraglouclide and achilloide A were isolated. Also, taraxasterol and pseudotaraxasterol acetates were identified.

Folk Medicinal Uses :

An infusion of the dry, or fresh, flowering herb is used by the Bedouin for the treatment of cough, aromatic bitter stomachic, and anthelmintic.

Pharmacological Actions and Indications:

The volatile oil prepared from the flowering tops showed a broad spectrum activity against various microbes. 13-O-desacetyl-1- β -hydroxy-isoafragloucolide caused inhibition of phasic contraction and of the tone of rat isolated ileum, uterus and aorta. It increased the phasic contraction of isolated urinary bladder. Cirsiliol caused relaxation of contracted rats proximal aorta, trachea, urinary bladder and uterus.

Neither acute nor subchronic toxicity were noticed in mice with ethanolic extracts of *A. fragrantissima*.

References :

1. Aboutabl, E.A.; Soliman, F.M.; El-Zalabani, S.M.; Brunke, E.J. and El-Kersh, T.A. 1986. Essential oil of *Achillea fragrantissima* (Forssk.) Sch. Bip. *Scienta Pharmaceutica*. **54**: 37-41.
2. Ahmed, A.A. 1988. Swertisin 2- arabinoside, a new C-glycosylflavone from *Achillea fragrantissima*. *J. Nat. Prod.* **51**(5): 971-972.
3. Ahmed, A.A.; Elsayed, N.H. and Mabry, T.J. 1989. Flavonoids of *Achillea santolina* and *A. fragrantissima* (Compositae, Anthemideae). *Rev. Latinoamer. Quim.* **20**(1): 5.
4. Ahmed, A.A.; Hussein, N.S.; El-Faham, H.A. and El-Bassyoni, A.A. 1995. A new monoterpene and pyran derivative from *Achillea fragrantissima*. *Pharmazie* **50**(9):641-642.
5. Ahmed, A.A.; Jakupovic, J.; Seif El-Din, A.A. and Melek, F.R. 1990. Irregular oxygenated monoterpenes from *Achillea fragrantissima* *Phytochemistry* **29**(4): 1322-1324.
6. Barel, S.; Segal, R. and Yashphe, J. 1991. The antimicrobial activity of the essential oil from *Achillea fragrantissima*. *J. Ethnopharmacol.* **33**(1-2): 187-191.
7. El-Deeb, K.S. 1985. Chromatographic and thermal analysis of certain volatile oils containing drugs. Cairo University, Cairo.
8. Elgamal, M.H.A.; Abdelwahab, S. and Duddeck, H. 1991. Constituents of *Achillea fragrantissima*. *Fitoterapia* **62**(4): 362.
9. Fleisher, Z. and Fleisher, A. 1993. Volatiles of *Achillea fragrantissima* (Fossk.) Sch. Bip, Aromatic plants of the Holy Land and the Sinai. Part XI. *J. Essent. Oil. Res.* **5**(2): 211-214.
10. Mustafa, E.; Abdalla, S.; Abuzarga, M. and Sabri, S. 1992. Constituents of *Achillea fragrantissima* and effects of 13-O-desacetyl-1- β -hydroxy-afragloucolide on rat isolated smooth muscle. *Fitoterapia* **63** (6): 526-533.
11. Mustafa, E.H.; Abuzarga, M.; Sabri, S. and Abdalla, S. 1995. Effects of cirsiol, a flavone isolated from *Achillea fragrantissima* on rat isolated smooth muscle. *Int. J. Pharmacog.* **33**(3):204-209.
12. Qureshi, S.; Shah, A.H.; Alyahya, M.A. and Ageel, A.M. 1991. Toxicity of *Achillea fragrantissima* and *Thymus vulgaris* in mice. *Fitoterapia.* **62**(4): 319-323.
13. Shalaby, A.F. and Richter, G.J. 1964. *Pharm. Sci.* **53** (12): 1502.

3. *Adiantum capillus - veneris* L. Sp. Pl.;ed.1, 1096 (1753).

Arabic :	<i>Kuzbarat el- bir</i>	كوزبارة
	<i>Sha'r el- ard.</i>	شعر العار
	Sha'r el- banaat.	شعر البناات
	Sha'r el- khanzir.	شعر الخنزير

English : Maidenhair, Venus's hair; Capillaire.

French : Adiante, Capillaire, Capillaire de Montpellier, Cheveux de vénus.

German : Frauenhaar, Capillärkraut; Venus haar.

Italian : Adiante, Capel-venere, Capovenere.

Turkish : Baldirikara, Kinulcede.

Berber : Guengit, Rajraf.

Morphological Description :

It is a delicate perennial fern, with a creeping rhizome. The fronds are 5-35 cm long; the petiole and rachis are shiny black; the blade is 2 to 3 pinnate ovate to ovate- elliptic; pinnules are born on thin black stalks, fan-shaped, up to 7 cm long, without midrib, veins branched dichotomously. The sori are arranged on the veins of the secured area of the lobes of the pinnules.

Ecology:

The plant grows in moist habitats rich in organic matter. It occurs usually on the moist walls of wells and springs of fresh water.

Distribution :

Local : In almost all the phytogeographical regions of the country. However, it is confined to very moist habitats, especially the shaded ones.

Regional : All the North African countries.

Global : A cosmopolitan species.

Status :

Being rare and confined to particular shaded moist habitats, it is endangered in wild.

Part used :

The whole plant above the ground which is represented by the fronds.

Constituents :

Tannin, mucilage, gallic acid, bitter substance, hydrocarbons, sterols, triterpenes and coumarins.

Folk Medicinal Uses :

It is used as diuretic, emollient, demulcent, expectorant, tonic, febrifuge; for treatment of obstructions of the liver and spleen. Concentrated decoction of the fronds is used as emmenagogue.

Pharmacological Actions :

It has an estrogenic activity on female rats. It inhibited their uterine motility. Extracts prepared with petroleum ether showed estrogenic changes in menopausal women given through vaginal ovules. It caused significant decrease in FSH level and increase in SHBG. It stimulates the force of contractions of isolated duodenal strips in small doses, while high doses, cause complete relaxation.

Oral administration of extract of *Adiantum capillus-veneris* to male swiss mice improved glucose tolerance showing hypoglycaemic effect.

Large doses stimulate the rabbits heart. It inhibits the growth of *Streptococcus pyogens*, *Bacillus subtilis*, *Corynebacterium ovis*, *Aspergillus flavus*, *A. niger*, *A. fumigatus*, and *Trichophyton mentagrophytes in vivo*.

Dose : One table spoon of finely cut leaves to 1-2 cups of water or hot milk.

References :

1. Chopra, R.N.; Nayar, S.L. and Chopra, I.C. 1956. Glossary of Indian Medicinal Plants, Council of Scientific and Industrial Research, New Delhi.
2. El-Tantawy, M.E.M. 1989. A Pharmacognostical Study of *Adiantum capillus-veneris* L. growing in Egypt; Ph.D. Thesis, Fac. Pharmacy., Cairo University.

3. Kulaib, M.H.A. 1997. Clinical and biochemical study of the steroidal estrogenic and progestational extract of *Adiantum capillus-veneris* L.; M.Sc. Thesis, Faculty of Medicine, Ain-Shams University, Cairo.
4. Launer, E. 1989. The Hamlyn Guide of Edible and Medicinal Plants of North and Northern Europe, p. 14, the Hamlyn Publishing Groups, London.
5. Mohammed, W.M. 1995. Biological hormonal activities of *Adiantum capillus-veneris* L. extract in menopausal women, M.Sc. Thesis, Faculty of Medicine, Ain-Shams University, Cairo.
6. Neef, H.; Declercq, H.N. and Laekman, G. 1995. Hypoglycaemic activity of selected European plants. *Phytother. Res.* **9**(1): 45-48.

4. *Adonis dentata* Del. Descr. Egypte, Hist. Nat. 287 (1813)

Arabic : *Zaghlil* 3/4ZU

Nab el-gamal 3/4SRB

English : Adonis

French : Adonide

German : Adonis

Italian : Adonide

Turkish : Kan avci out

Morphological Description :

It is an annual herb, reaching up to 40 cm in height, with erect branched stem; which is hollow internally. Leaves, alternate, exstipitate, sessile, simple and tripinnatisect with linear lobes with a green colour, a slight odour and a bitter taste. The flowers are terminal, small, solitary, pedicellate, yellowish-orange in color. The fruit is an aggregate, terminal, solitary, more or less cylindrical, composed of 40-60 achenes, with dark green colour before ripening turning to brownish red on ripening. They have a bitter oily taste and a slight odor (Plate 18).

Ecology:

The plant grows in shallow, fine sandy loamy soils in the Mediterranean coastal zone of Egypt.

Distribution:

Local : Mediterranean coastal zone, the deserts, and Sinai.

Regional : Egypt and Libya.

Global : Arabia deserts.

Status :

The plant is fairly common in its habitats. However, it does not appear in years with low rainfall.

Part used :

The above-ground flowering and fruiting herb.

Constituents :

The herb contains cardenolide glycosides namely : adonitoxin, acetyl adonitoxin, vernadigin, strophanthin-?, and cymarin. The total cardenolides amounted to 0.158% in the flowering and fruiting herb of *Adonis dentata*. They amounted to 0.13% in the leaves; 0.15% in the flowers, 0.09% in the stems, 0.05% in the roots, and 0.06% in the fruits. It also contains adonitol (0.4%).

Folk Medicinal Uses:

Ibn El-Beitar mentioned the use of "Eyn el Diek", which is one of *Adonis* species, by the Indian kings to cause self pleasure, to prevent aging by preserving strength and youth and as an aphrodesiac. El-Antaky added that '*Eyn el diek*' prevents heart failure, oedema and enlargement of the spleen. He used the drug as tincture, liquid extract or sweetened infusion, mixed with coriander or the drug may be chewed. It is also reported in cough mixtures and cardiotoxic preparations.

Pharmacological Actions and Indications :

The cardenolides of *Adonis dentata* are similar to those of *Digitalis* and *Strophanthus*. They stimulate the heart more rapidly with no cumulative effect. They are diuretic and neurosedative. The plant is toxic and should not be considered for self treatment.

References:

1. El-Kiey, M.A.; Sayed, M.D.; Abdel-Wahab, S.M. and Soliman, F.M. 1966. Investigation of the cardenolides in the different organs of *Adonis autumnales* L. and *Adonis dentata* Del. Growing in Egypt. Egypt. Pharm. Bull. U.A.R. **48** (6): 15-30.
2. El-Kiey, M.A.; Sayed, M.D.; Abdel-Wahab, S.M. and Soliman, F.M. 1967. Estimation of the cardioac glycosidal contents of *Adonis autumnale* L. and *Adonis dentata* Del. Planta Medica. **15** (2): 201-204.

3. El-Kiey, M.A.; Sayed, M.D.; Abdel-Wahab, S.M. and Soliman, F.M. 1969. Chromatographic study of the cardenolides in the overground part of the flowering-fruited herbs of *Adonis autumnale* L. and *Adonis dentata* Del, J.Pharm.Sci. , U.A.R. **10**(1) 81-91.

4. El-Kiey, M.A.; Sayed, M.D.; Abdel-Wahab, S.M. and Soliman, F.M. 1969. Comparative study of the colorimetric, chromatographic and biological methods of assay of *Adonis autumnale* L. and *Adonis dentata* Del. J. Pharm. Sci.; U.A.R. **10** (1) : 93-104.

5. Soliman, F.M. 1968. A Pharmacognostical study of certain *Adonis* species growing in Egypt. M. Pharm. Thesis, Faculty of Pharmacy, Cairo University, Cairo.

5. *Ambrosia maritima* L.; Sp. Pl.; ed. 1, 988 : (1753)

Arabic :	<i>Demsisa</i>	رUJU?t
English :	Sea ambrosia Oak of Cappadocia	
French :	Absinthe bâtarde Ambroisie	
German :	Traubenkraut	
Italian :	Ambrosia, <i>Ambrosia maritima</i>	
Turkish :	Ambrozia, Amberiye Yabani pelin, Ambrozia, Amberiye Zaylan çiç	

Morphological Description:

The plant is annual, hairy, much branched, 30-100 cm high . It has an aromatic odour and a slightly bitter taste. The stem is green, erect, solid, slender, striated with faint ridges. The leaf is simple, pinnatisect, petiolate, cauline, alternate and exstipulate, with ovate to triangular-ovate shape, with 3-7 lobes (Fig. 7, Plate 19).

Ecology:

The plant grows on the Nile and canal banks on the sediments from the Nile flood. After the construction of the high Dam and the lack of these sediments, the plant became rare. This threatens this species in addition to the continuous collection for folk medicinal uses.

Distribution:

Local : The Nile valley and the Nile Delta, Oases and the Mediterranean region.

Regional : Egypt, Libya, Tunisia and Algeria.

Status:

The plant is threatened due to the retreat of its habitat and the exploitation for folk medicinal uses. There is need for conserving this species, both *in situ* and *ex situ*.

Part used:

The above-ground flowering and fruiting herb.

Constituents:

The herb contains: Sesquiterpenes: ambrosin, damsin, farnesin, parthenin, hymenin, hymenolin, stamonin-?, anhydrofarnesin, chloroambrosin, desacetyl-dihydroconfertiflorin, neoambrosin, tetrahydroambrodamsin. Flavonoids: apigenin. Volatile oil: ?-pinene, cineole, carvone, camphor, camphene, caryophyllene and dehydroanthemol. Tannin. Choline. Sterols: ?-sitosterol and triterpenes, e.g. : ? - amyrin.

Folk Medicinal Uses:

1. A decoction of the plant is used for rheumatic pains, asthma, bilharziasis, diabetes and to expel renal stones.
2. Flowering branches are used as stimulant, stomachic, slightly astringent, emollient, vulnerary, diuretic and for renal troubles.

Pharmacological Actions and Indications:

1. It relaxes plain muscles of the intestine, uterus and blood vessels; where it inhibits the force and frequency of plain muscle contraction.
2. It significantly increases the urine output/day and the level of sodium in urine.
3. It decreases body weight.
4. Chronic administration damages the liver.
5. It has a good healing effect on wounds.
6. It has antimicrobial activity against: *Streptococcus pyogenes*, *Pseudomonas aeruginosa*, *Sarcina lutea*, *Bacillus subtilis*, *Klebsiella sp.*; *Aspergillus niger*, *A. flavus* and *A. terreus*.

7. It has an excellent molluscicidal activity due to its content of volatile oil and sesquiterpenes.
8. Sesquiterpenes: damsine, ambrosin, chloroambrosin and neoambrosin are cytotoxic against chinese hamster V-79 cells.
9. Oral administration of alcoholic extracts of *A.maritima* showed negligible effect on *Schistosoma mansoni* infection in mice.

References:

1. Abadome, F.; Geerts, S. and Kumar, V. 1994. Evaluation of the activity of *Ambrosia maritima* L. against *Schistosoma mansoni* infection in mice. *J. Ethnopharmacol.* **44**(3): 195-8.
2. Abdallah, O.M.; Ali, A.A. and Itokawa, H. 1991. Cytotoxic activity of sesquiterpene lactones isolated from *Ambrosia maritima*. *Pharmazie*, **46**(6): 472.
3. Amin, W.M.A. 1990. A pharmacognostical study of certain Egyptian molluscicidal plants. Ph.D. Thesis, Faculty of Pharmacy, Cairo University.
4. Belot, J.; Geerts, S.; Polderman, A.M.; Symoens, J.J. and Triest, L. 1992. Comparative evaluation of the molluscicidal activity of *Ambrosia maritima* in Egypt and Senegal. In: Vector control of Schistosomiasis using native African plants seminar, March 24, Brussels, pp. 101-112. Academie Royale des Sciences d' Outre-Mer, Brussels.
5. Triest, L.; Van de Vijver, M. and El-Arifi, M., Symoens, J.J. and Geerts, S. 1992. *Ambrosia maritima*: morphology, distribution, genetic and chemical diversity. In: Vector control of Schistosomiasis using native African plants. Seminar, 24 March, 63-77, Academie Royale des Sciences d' Outre-Mer; Brussels.

Fig. 7- *Ambrosia maritima* L.

(After: Täckholm, 1974. Students' Flora of Egypt).

6. *Anastatica hierochuntica* L.; Sp. Pl.; ed. 1, 641 (1753)

Arabic:	<i>Kaff el adhra</i>	كاف عذرة
	<i>Kaff maryam</i>	كاف مريم
	<i>Shagarat maryam</i>	شجيرة مريم
	<i>Kufayfah</i>	كوفية
	<i>Kaff Lala Fatima</i>	كاف لالا فاطمة
	<i>Shajarat el Talq</i>	شجيرة التلق
	<i>El- Kamsha</i>	الكامشة

- Berber :** Akraba, Tamkelt.
English : St. Mary's flower, Rose of Jericho, Jericho resurrection plant.
French : Rose de Jéricho, Jérose.
German : Jerichorose, Marienrose.
Italian : Anastatico, Rosa de Gerico.
Turkish : Mariam eli, Mariam çiç.

Morphological Description:

A winter annual small stellate-canescens plant. It is branched radially from base, prostrate or decumbent and often *ca* 15 cm across. In rainy years and relatively moist habitats the plant attains considerable dimetere. While in dry years, the plants are very small. Leaves, oblanceolate to obovate, entire or obsoletely dentate above, to *ca* 3 cm long, 2 cm wide, tapering at base to a petiole, often about 2/3 as long as the blade. In flower, the plant is mostly a few cm high with minute, white, sessile flowers and oblong dentate leaves. Fruiting plants are larger, indurated, globose with incurved pungent branches carrying the persistent fruits. The plants roll inward after maturity to form a tight woody ball 4-10 cm in diameter. The fruiting plants are hygroscopic expanding their branches easily on immersing in water. The dead plants do not appear to be subject to decomposition by fungi or bacteria (Fig. 7, Plates 20 &21).

Ecology:

The plant grows in silty basins or wadi beds with shallow soil. The size of the plant is highly variable from habitat to another and from year to year. This depends on the amount of available water supply. The plant, inconspicuous and short-lived when green and flowering, is more commonly noticed in the dry season after it has taken its characteristic woody, globose form.

Distribution:

Local : The plant is common in the Desert, the Red Sea and Sinai Regions.

Regional: All North African countries.

Global : The Arabian Peninsula, N. Africa, Mauritania, Iran, and Pakistan.

Status:

The plant is widespread in various habitats in the desert. It is not endangered. However, in dry years, which are frequent, the seeds do not germinate, so there is no more replenishment of the seed bank in its habitat. But it is to be noted that the seeds remain intact on the mother plant till rain comes. The dried plant's clenched branches expand and straighten when soaked in water. This is a seed-releasing mechanism.

Part used:

Dry whole plant.

Constituents:

The whole plant contains flavonoids : luteolin-7-glucoside, isovitexin, kaempferol 7-glucoside, kaempferol 3 rhamnoglucoside, quercetin and rutin; and glucosinolates : glucoiberin and glucocheirolin. Sterols are also reported. Fruits contain glucose, galactose, fructose, sucrose, raffinose and stachyose.

Folk Medicinal Uses:

The dried plant crushed with sugar and taken as energetic purge for cases of jaundice, followed by milk as diet. Its resemblance to a clutched hand has led to being linked to the Arabic folklore to the hand of the Virgin Mary at chilbed. It is believed that Mary clenched this plant in her hand when giving birth to Jesus. It is thus associated with childbirth and is still used as a herbal remedy popularly believed to ease childbirth if consumed as a tea or used as a charm. Generally, the plant is used

during childbirth; where the dried plant is soaked in water and the solution drunk by women at childbirth.

Pharmacological Actions and Indications:

The plant has been reported as an abortifacient and it has contraceptive properties.

References:

1. Khalifa, T. M..A. 1980. A pharmacognostical study of certain species of *Anastatica*, Ph.D. Thesis, Fac. Pharm., Cairo Univesity.
2. Rizk, A.M. 1986. The Phytochemistry of the Flora of Qatar. Scientific and Researh Centre. University of Qatar.

Fig. 8- Dry fruiting herb of *Anastatica hierochuntica* L.

(After: Boulos, 1983, Medicinal Plants of North Africa).

7. *Anchusa hispida* Forssk. Fl.Aegypt.-Arab. 40 (1775)

Gastrocotyle hispida (Forssk.) Bunge, Delect.Sem. Hort. Dorpat. 1849:2 (1849)

Arabic : *Kahil*

٣/٤?

Morphological Description:

Annual of variable habit and size, appressed-pubescent to hispidulous. Leaves linear-oblong to spatulate, obtuse or acute above, tapering at base, more or less repand-wavy, up to ca. 8 cm long, 1.4 cm wide. Flowers solitary in the leaf axils; calyx with triangular acute lobes 1.5- 3 mm long, spreading in fruit. Corolla about as long as or somewhat exceeding the calyx, pale blue or violet, rarely pink, with papillose scales in the throat. Nutlets ovoid, growing to exceed the calyx lobes slightly, ca 3 mm long, pale to nearly black, snail-shaped with a mouthlike, deeply concave, denticulate-margined basal ring (Plate 21).

Ecology:

The plant grows in shallow sandy soil with fine silt or limestone.

Distribution:

Local : The Mediterranean region, the desert, the Red Sea region and Sinai

Regional : North African countries

Status:

It is a fairly common plant in the desert.

Part used:

The leaves

Folk Medicinal Uses:

The plant can be used as a refreshing drink like tea. The decoction of the leaves is diuretic and is used in the treatment of rheumatism.

8. *Artemisia judaica* L., Mant. Alt. 281 (1771).

Arabic :	<i>Baathran</i>	بَاثْرَان
	<i>Baethran</i>	بَاثْرَان
	<i>Shih</i>	شِيه
	<i>Shih balady</i>	شِيه بَلَادِي
	<i>Shihan, Shihân</i>	شِيهَان
	<i>Hashîshah Khorasânîyh</i>	شِيهَانِ كُورَسَانِيَه

Berber :	Techedjili.
English:	Judean wormwood, Wormwood.
Frenech	Absinthe de Judée, Armoise de Judée.
German	Wermut aus Judäa.
Italian :	Seme Santo.
Turkish:	Yehuda pelin, Horasani.

Morphological Description:

It is a perennial herb, which attains up to 70 cm in height. The stem is erect, woody, profusely branched. It shows several slightly prominent ridges. It is light green in colour, rough, flexible, breaks with incomplete hard fibrous fracture. It is solid, yellowish-green internally, odour aromatic and a bitter persistent taste.

The leaves are alternate, sessile, simple, variously-lobed and ovate. Leaves are greyish-green in colour, with smooth velvet touch, brittle texture, an aromatic characteristic odour and a bitter taste.

The inflorescence carries hemispherical capitulae 1 cm in diameter, arranged in dense corymbose racemes. Each flower head carries 26-37 sessile tubular florets, which are inserted on a hollow receptacle. It flowers in late spring (Plate 22).

Ecology:

The plant grows in limestone wadis of the eastern Arabian Desert and Sinai.

Distribution:

Local : The plant grows in the desert regions, the Mediterranean region, the Red Sea region, Gebel Elba and Sinai.

Regional: Only Egypt.

Global : Arabia

Status:

The plant is overexploited for folk medicinal uses. It needs conservation, both *in situ*, and *ex situ*.

Part used :

The above-ground herb collected during the flowering stage.

Constituents :

Volatile oil up to 2.0% which contains piperitone, camphor, α -elemene, caryophyllene, bornyl acetate, borneol, isoborneol, p-cymene, α - and β -pinenes, camphene, myrcene, α ³-carene, limonene, α -terpinene, sabinyl acetate, thymol and nerolidol. It contains also the bitter principle judaicin.

Folk Medicinal Uses:

An infusion prepared from the flowering plant is used as stomachic, anthelmintic, expectorant, diaphoretic, analgesic, and antispasmodic in case of intestinal colic. Inhaled leaves relieve cold congestion, snakes are kept away by smoke of burnt branches.

Pharmacological Actions and Indications:

Volatile oil prepared from flowering branches has insecticidal, anthelmintic, antiinflammatory and analgesic, antipyretic and stimulant effects. It has antimicrobial activity against *Staphylococcus aureus*, *Candida albicans* and *Rodotorula rubra*.

Serum biochemical parameters in mice showed insignificant changes when treated with volatile oil of *A. judaica*, while a sharp increase was observed in neutrophil count and significant decrease in lymphocytes was noticed.

References :

1. Karawya, M.S.; Hifnawy, M.S. and El-Hawary, S.S. 1977. Volatile oil of *Artemisia judaica* L.; VII International Congress of Essential Oils, Oct.7-11, Kyoto, Japan.
2. Soliman, R.A. 1995. Some Pharmacological studies of certain medicinal plants. M.Sc. Thesis, Cairo University, Cairo.

Artemisia herba-alba Asso, Syn. Strip. Fl. Aragon. 117,t, f. 1 (1779). (= *Artemisia inculta* Del., Descr.t. Nat. 264 (1814), nom. nud. ~~Ⓝ~~ ~~RS~~ ~~Yr~~ T?U

The plant is an aromatic woolly-canescens undershrub, 30-60 cm high. Stems are many branching from the base. Root leaves and leaves of sterile branches petioled, bipinnatifid into oblong to oblong-linear lobes, those of flowering branches much smaller, few-lobed and clustered. Heads sessile, ovoid, brownish, somewhat fleshy, orbicular, the inner ones oblong to oblong-linear acute, with a very broad scariuous margin (Plate 23).

The plant is a good range plant growing in the north-western coastal zone of Egypt and in the wadis of Sinai. Due to its content of volatile oil, the plant is commonly used in folk medicine.

Folk Medicinal Uses:

Leaves and flowers febrifuge, calmativer for stomach, cough and cephalagia; cures nervous troubles and calms the emotions; used for ophthalmic diseases; enters in mixtures for treating hemorrhagic wounds. Infusion of flowering branches vermifuge, emmenagogue, tonic stomachic. Dr powdered plants for healing wounds and burns, diuretic; infusion for rheumatism, bronchitis; cataplasm of boiled flowers used to ripen and cure abscesses, antidiarrhoeic. Essential oil distilled from the plant antiseptic and insecticide, also used as parasiticide in veterinary medicine.

9. *Balanites aegyptiaca* (L.) Del.; Fl. Egypte 221, t. 28. f. 1. (1813),

Descr. Egypte, Hist. Nat.; III. 61, no. 427 (1814)

Ximenia aegyptiaca L.; Sp. Pl.; ed. 1, 1194 (1753)

Arabic : *Heglig* سفس?

Fruits : *Balah Es-Sukkar* ت؟USP

Balahat Guha ا؟S r š?

Berber : Taboraq, Teisset, Addoua, Alo.

Fruits: Ebor, Ibororhen, Tugga.

English : Thorn tree, Egyptian balsam, Zachum oil tree, Desert date, Soapberry bush.

French : Dattier du desert, Hagueleg, Balanite d'Egypte

German : Ägyptischer Zahnbaum, Zachunbaum.

Italian : Dattero deserto.

Turkish : Haglig.

Morphological Description:

An evergreen small tree up to 8 m high, very variable, usually spiny, the branches spreading or pendulous; young stems and spines greyish-green becoming light brown, at first minutely puberulous or tomentellous, glabrescent later. Spines (0.6-)1.2-3(-3.2) cm apart, 0.1-0.4 cm above the axil (0.4-)2-8(-11.5) cm long, naked except for a few scale-leaves or rarely a single short lateral spine. Scale-leaves, rare, on young spines, falling quickly, triangular, acute, 0.75 mm long. Foliage-leaves, only on the stems, closely and minutely puberulous, often glabrescent, or sometimes densely tomentellous, subsessile or with a petiole (0.3-) 1.1-6.4(-6.8) x (0.3-)0.4-3.7(-5) cm, leathery; apex bluntly acute to obtuse or rounded; base cuneate, sometimes narrowly decurrent; leaf apiculus (small extension between the two leaflets), 1.5-2.5 mm long, often falling. Flowers, 5-merous, (1-)2-15(-20 or more) variously arranged in loose or tight cymose fascicles at spinous nodes, on spineless stems, or closely arranged on shoots of short internodes, sometimes more or less spiciforme; pedicels finely tomentellous, 0.4-1.1 (-2) cm long. Sepals, sometimes falling early, tomentellous on the outside, 3.5-5 x 2 mm. Petals, narrowly obovate-elliptic, yellowish or blue green, 4.5-6 x 1-2 mm. Stamens, 10. Ovary pubescent to tomentose, to 1 mm high; style, 1-2 mm long. Fruit elongating markedly in early development, becoming ovoid to ellipsoidal, usually rounded or truncate at both ends, usually ripening yellow, (2.3)2.9-4(-4.5) x (1.3-)1.7-2.2(-2.5) cm (Plate 24).

Balanites aegyptiaca is a multipurpose tree known by its many uses as fuelwood, charcoal, timber, fodder, antifeed (pesticides), ..etc. In the Sudan, the fruits are edible and the seeds are crushed to produce oil for cooking. Both the fruit and the oil are used for medicinal purposes.

The fruit, which is edible, yields a valuable oil and also contains saponins which are lethal to certain invertebrates and thus of value in eliminating the carriers of guinea-worm and schistosomiasis. The trees are frequently heavily browsed.

Ecology:

The tree is drought and fire resistant and withstands up to 2 months flooding in areas near the river. In the Sudan, *Balanites* was formerly protected by law as well as by the local inhabitants who believe that *Balanites* trees bring the rains. This belief has given protection to the tree even in mechanized crop production schemes, where all other tree species were cleared for farming purposes. However, with the recent development in carpentry technology and the increased human pressures for its valuable timber, the tree is continuously cut. Though the tree regenerates naturally

by seeds or by its moderate coppicing, yet with such rate of clearance of the species, is endangered.

Distribution:

Local : Gebel Elba, South Eastern Desert, Oases

Regional: Egypt, Libya, Algeria and Morocco

Global : Subtropical , Tropical Africa, and Arabia

Status:

The plant is used for different purposes, fuel, timber, medicinal, shade, etc. Propagation of the plant is necessary as the plant is endangered.

Part Used:

Stem Bark and the fruits.

Constituents:

The kernel (10%) contains 40 %- 58 % of liquid glyceride oil . The mesocarp contains 38 % sugars, 15% organic acids and 46 % other organic substances. In Uganda, the kernels of seed yield 48.8 % of golden yellow oil for soap-making.

Stem bark contains a saponin. The plant contains balanitin -1, -2 and -3; balanitin -1 for example possesses a yamogenin aglycone with a branched glucose and rhamnose side chain. The plant is reported to contain 5.6 % diosgenin. Seeds contain furocoumarins.

Uses :

As fish poison but not toxic to man. Anthelmintic, purgative, vermifuge, emetic and in the treatment of boils, leucoderma, herpes, malaria, wounds, syphilis, cold and liver. The oil of fruit kernel is used for dressing wounds and in rheumatism.

Cultivation:

The plant can be cultivated by seeds and cuttings.

References :

1. Hardman, R. and Sofowora, A. 1972. Economic Botany. **26**:169-73.
2. El Nour, M.; El Khalifa, K.; Massimo, K. and Hassen, B. 19... Preliminary study on seed pregermination treatment and vegetative propagation of *Balanites aegyptiaca* (L.) Del.; In: A.Riedacker et al (eds), Physiologie des Arbres et Arbustes en Zones Arides et Semi-arides. John Libbey Eurotext, Rome, Italy, pp.413-416. Groupe d'Etude de l'Arbre- Paris, France.
3. Oliver Bever. 1986. Medicinal Plants in Tropical Africa. Cambridge University Press.

12. *Bryonia cretica* L.; Sp.Pl.:ed.1,1013 (1753).

Arabic: *Le'eba Murrah* **ر؟رر؟**

Status:

This species is now almost extinct in Egypt. A few specimens were collected from the Western Mediterranean Coastal zone of Egypt (between Alexandria and Mersa Matruh). This plant grows mainly in the sandy habitats near the coast. The severe and drastic changes in the habitat supporting this species lead to its extermination. It is to be noted that its habitat is the place where the new summer resort areas were established all over the coastal zone. The removal of this habitat is the main reason for its extinction.

One may claim that the collection of the plant is among the reasons of its extinction. However, this was practiced till the late sixties of this century. Till that time, it was possible to find a specimen here and there. After the seventies, and the boom of constructions and development of the summer resorts, the habitat supporting this species has been completely eradicated.

The following records are those in the Herbarium of the Department of Botany, Faculty of Science, Cairo University :

Alexandria, April, 1903; Blandenier
Ikingi Mariut, 16.4.1911; G.Maire
Mariut caves, 1929; Drar
Mariut, Burg El Arab, 18.3.1931; Oliver
Burg El Arab, 18.3.1931; Oliver
Mariut, 13.3.1952; Kamel
Abuqir, 14.3.1954; El-Hadidi
Between Alexandria and Mersa Matruh, 25-28.2.1958; Botany Dept.
Excursion
Burg El Arab, 2.4.1960; S.Ghabbour
Burg El Arab, 2.4.1965; I.El-Sayed

Being almost an extinct plant in Egypt, it seems important to show the numerous citations of this species in the different botanical sources.

Bryonia cretica L.; Sp.Pl.; ed. 1, 1013 (1753)

ed. 2, 1439 (1763)

ed. 3, 1439 (1764)

Lam.;Encycl. I, 498 (1783)

Willd.; Sp.Pl.; ed. 4, 621 (1805)

Desf.; Choix de pl.; 91, t.70 (1808)

Delile, Fl.Aegyp. Illus. ii, 77, Art 931 (1812)

Ser. in DC Prod. III, 307 (1828)

Sibth.; Fl.graec. X, 31, t. 940 (1840)

Naud. in Ann. sc.nat.; 4 ser XII, 138 (1859)

Unger *et* Kotschy, Die Insel Cypem, 341 (1865)

Boiss.; Fl.Orient. II, 760 (1872), Supp.; 242 (1888).

Cogn. in DC. Mon.Phan. III, 472 (1881)

Ascherson *et* Schweinf. Illus. Fl. Egypte, 77 (1887)

Sickenberger Contrib.Fl.d'Egypte, 237 (1901)

Halacsy, Consp.Fl.Graec.; 1:550 (1901)

G.Dortler in Verh.zool.bot.Ges.; Wien LV, 19 (1905)

Durand & Barratte, Fl. Lib.Prodr. 158 (1910)

Muschler, Man.Fl.Egypt II, 941 (1912)

Cogn.u.Harms in Pflanzenreich IV, 275, pl.81 (1924)

Post, Fl.Pal.;ed.2, 1:481 (1932)

Pamp.; Prodr. Fl.Ciren. 428 (1931)

Tutin in Tutin *et al.*; Fl.Europ. 2:297 (1968) quoad ssp.*creticam* tantum

Davis, Fl. Turkey, 4:204 (1973)

Taeckholm, Student's Fl. Egypt, ed.2.; 372 (1974)

Meikle, Fl.Cyprus 1:678 (1977)

Morphological Description:

Climbing perennial herb, with fleshy roots, stem annual, slender, grooved and ridged, branched, glabrous or sparsely pilose. Leaves, petiolate. Petiole, rather robust, glabrous or sparsely rough, 2-6 cm long. Lamina orbicular, palmately 5-lobed or 5-partite, at the base rather deeply emarginate, firm strongly asperous, pale or deeply green above, white striate at the nerves, yellow below, 5 to 12 cm long and nearly as broad. Tendrils, slender, elongated. Flowers, dioecious. Sepals 2 mm long. Petals, livid-yellow with subarticulate green nerves, puberulous on the outside, with ovate-oblong, obtuse segments, which are 5 to 6 mm long. Male flowers on a

slender peduncle, 8-18-flowered, 5-10 cm long, pedicel filiform, spreading, 0.5 to 2 cm long. Filaments of the stamens long-villous, 1 to 1.5 mm long, anthers, 3 mm long. Female flowers few, corymbose or subsolitary, common peduncle from 0.5 to 2 cm long, pedicels rather long. Style not exerted with rough stigmata. Fruit, a globular green berry before maturity, with white veins, then becomes red, indehiscent, 8-9 mm in diameter. The fruit, contains 3-6 seeds. Seeds, favulose, and dark-red veined, very slenderly rugulose, smooth at margin, 4-6 mm long, 2-4 mm wide, 1-2.5 mm thick (Plate 25).

Ecology:

The plant grows in deep sandy soils in the Mediterranean coastal zone. It grows mainly in relatively moist habitats, i.e. in caves and depressions receiving runoff water. In Cyprus, it has been recorded to grow in forests, scrub, hedges, sea level to 1000 ft alt.

Distribution:

Local : There are records from Abuqir, Burg Al Arab, Ras El Hikma, and Matruh.

Regional : Egypt and Libya only.

Global : East Mediterranean region, from Greece and Cyrenaica to Palestine, Egypt, Cyprus, and Crete.

In the other countries of North Africa (Libya, Tunisia, Algeria and Morocco) another species of *Bryonia* has been recorded, i.e. *Bryonia dioica* Jacq.

Part Used:

The roots collected in summer, kept entire or split longitudinally and dried. They are known as *Le'eba Murrah* **R?rrY?**

The roots as they occur in commerce are generally small in size, conical in shape, varying from 5 to 15 cm in length and 1 to 3 cm in diameter. They are crowned with the stem scars; longitudinally wrinkled at intervals with very faint transverse ridges. They are hard, smooth and pale yellowish-pink externally; white, starchy and do not show any concentric rings internally. The fracture is short and mealy; taste, bitter and acrid; odour, very faint. During the process of drying the roots shrink enormously and the outer greyish-yellow corky layer is almost entirely removed.

The roots are bitter, tonic, alterative, purgative and are used as a remedy for diabetes by the natives.

Constituents:

The drug contains about 40 % of starch; 2.5 % of resin; about 0.25 % of an amorphous glucosidal principle; 0.2 % of an amorphous alkaloid; an alcohol, bryonol; traces of phytosterol; volatile oil; enzymes;etc. Ash about 6%.

Folk Medicinal Uses:

The drug is mainly used in Egypt as a bitter tonic and to ameliorate the condition of diabetic persons. It is also used as a hydragogue cathartic and diuretic in pleurisy, dropsy, whooping cough, bronchitis and tonsillitis. Applied to the skin, it is irritant and may cause vesication.

It is to be noted that the roots of bryony referred to in the ancient and modern literature are those of *Bryonia dioica* and *B. alba*. *B. dioica* is among the North African plants, therefore it seems reasonable to give an account of this species, especially that its collection would threaten its existence.

Bryonia dioica Jacq.

Arabic : *Enab el hayah* رفسر
Butaniyah رفسر
Khiytah رفسر

Berber : Tailoula, Tara bouchehen, Telmoumi.

English : Snake - bryony, white wild vine, common bryony.

French : Navet du diable, Bryone dioique, Bryone-couleurvrée, Vigne noire.

German: Rote Zaurübe.

Italian : Rape del diavolo, R. di serpente, Barbone

Turkish : Ak asma, Seytan Salgami

Part used:

Dried sliced root of *B. dioica* Fam. *Cucurbitaceae*.

Description:

The dried slices about 5 cm in diameter and have a thin yellowish-grey cork, a whitish wood marked with concentric rings and radially arranged vessels.

Constituents:

Starch, bryoresin, glycosides, essential oil, bryocinin, bryonin, invert sugar, unknown purgative components, alkaloid, fatty acids and bryonol.

Folk Medicinal Uses:

Cathartic, diuretic, irritant to the skin. It is recommended for pleurisy, whooping cough and bronchitis and has been given in cases of dropsy. It is also used in rheumatism, depurative of blood, antitumor and for epileptic crises.

Pharmacological Actions, Indications and Toxicity:

The juice from the fresh root first causes reddening then painful inflammation with the formation of blisters. The acrid-tasting, shiny berries of *Bryonia* species are likewise toxic. Repeated vomiting is the evidential symptoms of poisoning in addition to abdominal pains, bloody diarrhoea, dizziness, renal inflammation and in serious cases respiratory paralysis.

References :

1. Fahmy, I.R. 1932. Medicinal Plants and Vegetable Drugs, Paul Barbey's Print.Office, Cairo.
2. Frohne, D and Pfänder, H.J. 1983. A Colour Atlas of Poisonous Plants, Wolfe Science.
3. Hassib, M. 1938. Cucurbitaceae in Egypt. The Fouad I University, Faculty of Science, Publ. No.3, pp173.

11. Calotropis procera (Aiton) W.T. Ait.f.; Hort. Kew. ed. 2, 2: 78 1811.

Asclepias procera Ait.; Hort. Kew. 1: 305, 1789.

Arabic: Oshar

tUw tðw

English: French cotton, Mudar plant

French: Calotrope, Arbre a soie, Fafetone, Pomme de Sodome

German : Wahre Mudarplanzer, Gomeiner

Italian: Calotropo

Turkish: Ipek ag

Berber: Torcha, Tourza, Ngeyi

Description:

Erect shrub or tree, 3-5 m high, much branched from the base, latex milky, young branches covered with white cottony tomentum. Leaves up to 27 x 16 cm, broadly ovate, ovate-oblong elliptic or obovate. Entire, base cordate, apex acute, subsessile. Flowers ca 2.5 cm across, white outside, purplish within, darker on the tips. Fruit 10-14 cm x 9-11 cm, subglobose. Seeds ca 8 mm long, 6 mm broad, ovate (Plate 26).

Ecology:

The plant grows in fine sandy soils. It is widespread in the deserts of the Middle East in localities already occupied by the settlements of Bedouin. Usually, it grows as a secondary vegetation after the eradication of *Acacia* trees for fuel-making.

Distribution:

Local : It grows in almost all the phytogeographical regions of Egypt, except the Mediterranean region.

Regional: Egypt, Libya

Global : Tropical to dry parts of Africa, Arabia, Palestine, W. Indies, Brazil, Colombia and Venezuela.

Status:

The plant is widespread. No fear of extinction.

Constituents:

Cardenolides: calotropin, calotoxin, saponin, and choline.

Folk Medicinal Uses:

A decoction is used in veterinary medicine, antileprosy, Powdered dried leaves are vermifuge in small doses. They are smoked for asthma. Fresh leaves are used in the form of cataplasm for sun stroke. Leaf extracts cardiogenic. Roots are emetic, expectorant. Root bark is used for dysentery. Latex causes serious inflammations and may lead to blindness. It is used for scabies of the camels and goats. It is applied on the teeth to loosen them. It is used as a drastic purgative, emmenagogue, for bites and skin diseases. Flowers are used in small doses for cold, cough, asthma, and in digestion. It was used by ancient Indians as arrow poison due to its slow effect on the heart similar to *Digitalis*.

Fruit fibres and seed hairs may be used for filling cushions and for making ropes. Wood is used for making powdered pyrites and gun powder charcoal.

Pharmacology:

Alcoholic extract stimulates rabbit's intestine, rectus abdominus muscle of frog and contracts the uterus of virgin female rats.

12. Capparis spinosa L.

Arabic :	<i>Akbaar</i>	tœ?
	<i>Asef</i>	ZU?
	<i>Shafallah</i>	ŠŹU
	<i>Kabâr</i>	tœ?
	<i>Lasaf</i>	ZU?

Berber : Terloulout, Taybult, Amserlih, Tsailih, Tsailaoul, Ouai lonlou, Belachem.

English : Common Caper-bush.

French : Căprier, Căprier commun, Caprier epineux.

German : Echter Kappernsrauch, Kapper.

Italian : Cappero, Cappers de' muri, Cappirs spinosa.

Turkish : Keber fidani, Kebere.

Morphological description :

It is a low perennial trailing shrub, with procumbent or pendulous branches. Leaves are greyish-green, sound, simple and thick. Flowers are white with red stamens. They appear from March to June. Each flower lasts for one day. Fruits with numerous light brown seeds (Plate 27 & 28).

Ecology:

The plant grows in compact fine-textured soil as well as on steep cliffs.

Distribution:

Local : Deserts, Oases, and Sinai.

Regional : All North African countries.

Global : Widespread, especially in Mediterranean countries and the Arabian Peninsula

Status :

The habitat of this species, including all its varieties, is subjected to severe disturbance. There is a great need to conserve the various subspecies.

Part used :

The whole plant .

Constituents :

Alkaloids which amount to 0.91% in the root bark, 0.86% in the seeds, 0.02% in the leaves and 0.04% in the fruits. Stachydrine was isolated and identified in the plant. Flavonoids : Quercetin-3-rutinoside, quercetin-7-glucorhamnoside, kaempferol-3-rutinoside, kaempferol-3-rhamnourutinoside and rutin (2.1%). Glucocapparin volatile oil; sterols and saponins.

Folk Medicinal Uses :

Roots are used as tonic, astringent and diuretic. Root bark, appetizer, purgative, anthelmintic, emmenagogue, analgesic and applied externally as cataplasm for spleen troubles. Bark is used for treatment of gout, rheumatism, laxative, expectorant and for chest diseases. Infusion prepared from the stem and root bark for diarrhoea and febrifuge. Flower buds and roots are utilized as renal disinfectants, diuretic, tonic and for arteriosclerosis and chills, as well as compresses for the eyes. Leaves and fruits are carminative and aphrodisiac. Fresh fruits are antiscorbutic, their infusion is used for sciatica. Powdered fruits mixed with honey are taken in the morning for sciatica and backache (Rabat drug market). Flower buds are refreshing, stimulant and slightly diuretic. Seeds for treatment of feminine sterility and dysmenorrhea. They are crushed and applied externally on ulcers, ganglions and scrofula. The flower buds are pickled. Young buds are used for pizza flavouring.

Pharmacological Actions, Indications and Toxicity:

1. The herb has a hepatoprotective effect. It reduced significantly serum transaminases.
2. It has an antitumor activity against human leukemia *in vitro*.
3. It has an immunosuppressive effect.

References :

1. Chaya, G.; Mishra, S.H. and Gadgoli, C. 1995. Preliminary Screening of *Achillea millifolium*, *Cichorium intybus* and *Capparis spinosa* for Antihepatotoxic Activity. *Fitoterapia*, **66**(4): 319-323.
2. El-Tanbouly, N.D. 1990. A Pharmacognostical study of *Capparis spinosa* L. var. *aegyptia* Boiss. growing in Egypt. Ph.D.Thesis, Faculty of Pharmacy, Cairo University.

3. Shirwaikar, A.; Sreenivasan, K.K.; Krishnanand, B.R.; Kumar, A.V. and Vasanth, K.A.1996. Chemical Investigation and Antihepatotoxic Activity of the Root Bark of *Capparis spinosa*. *Fitotherapia* **67**(3): 200-204.

13.Centaurea pumilio L.;Cent.Pl.;1:30 (1755)

Aegialophila pumilio (L.) Boiss., *Diag. Pl.Orient.*; ser.1,10:105 (1849).

Arabic: *Akash*

ا كاش

Description:

Stemless, somewhat fleshy perennial herb, frequently with a large root tuber. Close to *Centaurea*, bur achenes silky with a small scarious persistent crown and a deciduous pappus. Flower heads large, with white or pink radiating flowers. Involucral spine 5-6 mm long (Plates 28 & 29).

Ecology:

The plant grows on the maritime pseudo-oolitic sand dunes in the western Mediterranean coastal zone. It is to be noted that *Cistanche* sp. Parasitises on this plant. *Centaurea pumilio* sends deep fleshy roots in the sand dunes to a depth more than 50 cm, the fine roots extend more than one metre, deep and 2 m horizontally.

Distribution:

Local: The western Mediterranean coastal zone

Status:

The plant is seriously endangered for two reasons: firstly due to the overcollection of the plant by uprooting it to make use of the roots in folk medicine; secondly due to the eradication of the habitat of the plant due to the construction of buildings and villages as summer resort in the western coastal zone.

Part used:

The dried roots which are cut into slices.

Folk Medicinal Uses:

It is used as a fattening agent added to other ingredients.

14. Centaurium pulchellum (Swartz) Druce, Fl. Berkshire 342 (1898)
Gentiana pulchella Swartz, *Gentiana ramosissima* (Vill.) Pers.;
Erythraea pulchella (Sw) Fr.; *Centaurium ramosissimum* (Vill.) Druce

Arabic : *Qantariuon* **??fu??**

English : Branching Centaury

French : Centauree'

German : Flockenblume

Italian : Fiel di terra

Turkish : Bueyuet kantarion

Morphological description :

Annual glabrous herb. Stem, erect, stiff, much branched. Leaves, rosette, sessile, ovate, basal leaves obtuse. The upper leaves, ovate, lanceolate, acute and smaller. Flowers, pink, forked, cymose-paniculate short-pedicelled, corolla tube, 1 2½ times longer than calyx segments. Its lobes oblong, obtuse. Stigma, oval, anthers oblong. Fruit, capsule, two-valved, many seeded. Seeds, minute, bright brown. Flowers from March to May.

Ecology:

Habitat conditions : moist soils.

Distribution :

Local : Fairly common plant , grows mainly among cultivated crops by water sides in Fayoom area and the North coast .

Status:

The plant grows in specific moist habitats, which are subjected to changes and drying. So, the plant is endangered in Egypt.

Part used :

The whole flowering and fruiting herb.

Constituents :

It contains the alkaloid gentianine; a bitter principle kantaurin, a triterpene; oleanolic acid, erythrosterol, and xanthenes; 1-hydroxy-3,7,8-tri-methoxyxanthone, 8-dihydroxy-3,7-dimethoxyxanthone and 1,8-dihydroxy-3,5-dimethoxyxanthone.

Folk Medicinal Uses :

A decoction is used for gastric and abdominal pain, hypertention, renal colic, rheumatic pains and for the elimination of stones from the kidney and urethra; healing agent for wounds in ointments for sciatica. An infusion of the herb is used for diabetes.

Substitutes :

The flowering and fruiting herb of *C. spicatum*. It is characterised by leaves, oblong or oblong-lanceolate, obtuse at the apex. Flowers, spicate, racemose on simple leafless branches. Corolla tube, longer than subulate calyx segments.

References:

1. Britton, N.L. and Brown, H.A. 1970. An illustrated Flora of the Northern United States and Canada. Vol. III. Dover Publ. Inc., New York.
2. Rizk, A.M. and El-Ghazaly, G.A. 1995. Medicinal and Poisonous Plants of Qatar University of Qatar, Doha.

15. Centaurium spicatum (L.) Fritsch, Mitt.Naturwiss.

Vereins.Univ.Wien,ser 2,5:97 (1907)

Gentiana spicata L.; *Erythraea spicata* (L.) Pers.

Arabic : *Qantarioun*

??ftu??

Menash ed-dibban

œtœE??

Nashash ed-dibban

?œtœEœd?

English :Spicked Centaury

French :Petite Centaure'e

Morphological Description :

Stems, glabrous, erect, strict, usually branched. Leaves, oblong, or lanceolate oblong, sessile, clasping at the base. Flowers, pink, sessile, distant and spicate-racemose on the mostly simple and leafless branches, tube of the corolla somewhat longer than the subulate calyx segments, 2-3 times as longer as the linear oblong lobes. Fruit, capsule with numerous minute, brown seeds (Plate 30).

Ecology:

In moist habitats.

Distribution:

Local : Oases, Nile Valley, Mediterranean region and Sinai

Regional : All North African countries

Global : Widespread in old and new world.

Part used :

The above-ground herb of *Centaurium spicatum* (L.) Fritsch.

Constituents :

Bitter substances, triterpenes and resin .

Folk Medicinal Uses :

The herb is used for hypertension, elimination of ureter and kidney stones, healing agent for wounds, as ointment for sciatica and as infusion for diabetes.

Pharmacological Actions and Indications:

LD₅₀ = 3875 mg per Kg. Toxicity Symptoms: arched back, abdominal pain, quick and shallow respiration. Ethanolic (70%) extract has inhibitory effects on rabbits duodenum, rats uterus, isolated rabbit's heart, hypotensive in large doses to dogs, diuretic, with androgen-like effect on rats, hypoglycemic, with no hepatoprotective effect.

The plant extract exhibited antibacterial activity in vitro against *Staphylococcus aureus*, *Streptococcus pyogenes*, *Corynebacterium pyogenes*, *Salmonella typhimurium*, *Escherichia coli* and *Pseudomonas aeruginosa*.

Prolonged administration produces significant decrease in body weight, decrease in RBCs count, increased PVC, MVC, MCH and WBCs count. It causes destructive changes in liver and kidney.

References:

1. Al-Zorba, H.Y.M. 1997. Pharmacotoxic studies on *Cleome droserifolia* and *Centaurium spicatum* herbs used in folkmedicine. M.V.Sc.Thesis, Cairo University.
2. Britton, N.L. and Brown, A.1970. An Illustrated Flora of The Northern United States and Canada. Vol.3. Dover Publication, Inc., New York .

16. Cleome droserifolia (Forssk.) Delile, Descr. Egypte, Hist. Nat. 250
(1814)

Roridula droserifolia Forssk.; Fl. Aegypt- Arab. LXII. (1775)

Arabic: <i>El-Samwa</i>	ر??U?E
<i>Afein</i>	?f?w
<i>Reh elBard</i>	ttr?E
<i>El-Mashtar</i>	tuU?E

Morphological Description:

A wild perennial herb about 60 cm high, much branched. The plant carries cauline leaves. They are simple exstipulate and petiolate. The petiole is green, long and cylindrical. It measures from 1.1 to 1.3 cm in length and from 0.2 to 0.3 cm in diameter. The lamina is ovate-rotundate having an entire margin, an obtuse apex, and asymmetric base. It measures from 0.8 to 0.9 m in length and from 0.5 to 0.8 cm in width. The venation is triple-nerved at the base, the veins being more prominent on the lower surface. The upper surface is green in colour and the lower surface is lighter in colour. The leaves have a characteristic slightly disagreeable odour and a bitter taste. Flowers are yellow. The flowering stage is from February to August (Fig.9 & Plate 30).

Ecology:

The plant grows in rocky and gravelly habitats.

Distribution:

Local : The deserts, especially the Eastern desert, Red Sea region, Sinai, Gebel Elba.

Regional : Egypt and Libya

Global : Arabia, Ethiopia, Egypt and Libya

Status:

In the last decade the plant has been subjected to severe overexploitation to be used in folk medicine for diabetes. It has been eradicated from vast areas, especially in Sinai and the Eastern desert. However, in the far south of the Eastern desert, the plant is still flourishing and is growing in many wadis. Conservation of this species is urgent.

Part used:

The air-dried herb, known as:

Arabic: *Al-Samwah*

R??U?E

English: Cleome herb,

Latin: *Herba Cleome droserifolia*

Constituents:

Volatile oil about 0.4% which consists of 3-butenylisothiocyanate, 2-methyl-butenylisothiocyanate, benzylisothiocyanate, ? ? ? & ?-caryophyllene, 2-naphthyl-n-propyl ether. Sesquiterpenes: carotol and dihydrodihydroxy carotol.

Glucosinolates with sulfur aglycones e.g. glucocapparin. Flavonoids (0.295%) which consist of kaempferol-3,7-dirhamnoside, isorharmnetin-3-gluco-7-rhamnoside, kaempferol-3-gluco-7-rhamnoside, quercetin-3-gluco-7-rhamnoside, kaempferol, artemitin, 5,7,4[\]-trihydroxy-3-methoxy flavone, 5,7,4[\]-trihydroxy-3,3-dimethoxy flavone, 5,7,4[\]-trihydroxy-6,3[\]-dimethoxy flavone (jaceosidin), 5,4[\]-dihydroxy-3,6,7 trimethoxy-flavone (penduletin), 5, 7,3[\],4[\]-tetrahydroxy-3,6-dimethoxy flavone (axillarin), 5,3[\]-dihydroxy-3,6,4[\],5[\]-pentamethoxy flavone, 5,4[\]-dihydroxy-3,6,7,8,3[\]-pentamethoxy-flavone, 5-hydroxy-3,6,7,3[\],4[\],5[\]-hexamethoxy flavone. Sterols e.g. ?-sitosterol and stigmasterol, triterpenes, saponins, coumarins, alkaloids and docosanioc acid.

Folk Medicinal Uses:

1. Paste of powder used topically for treatment of wounds and for dermatitis.
2. Powder (5 g.) taken before meal, for treatment of hyperglycemia (diabetes).

Pharmacological Actions and Indications:

1. Aqueous and chloroformic extracts of the herb showed a significant reduction of blood glucose in rats.

2. Aqueous extracts of the herb showed a good antimicrobial activity against *Staphylococcus aureus*, *Streptococcus faecalis*, *Pseudomonas aeruginosa*, *Proteus vulgaris*, *Klebsiella pneumoniae*, *Escherichia coli* and *Candida albicans*.
3. LD₅₀ = 2175 mg per Kg. Toxicity symptoms: tremors, convulsions, arched back, sweating, rapid and shallow respiration, coma followed by death.
4. Ethanolic (70%) extract of the plant has antihistaminic effect, inhibitory effect on rabbits duodenum, uterus, rabbits heart, a relaxant effect on guinea pig's trachea, decrease in arterial blood pressure, diuretic and mild tranquilizing effect with moderate progesteron-like action.
5. hypoglycemic and hepatoprotective. It is safe for oral administration.
6. It causes decrease in body weight in rats.

Toxicity:

Very toxic if given intrapretoneally.

References:

1. Ayoub, N.A. 1993. Phytochemical study of certain Egyptian plants used as antimicrobial folk remedies. M.Sc. Pharm. Thesis, Faculty of Pharmacy, Cairo University.
2. El-Zorba, H.Y.M. 1997. Pharmacotoxic studies on *Cleome droserifolia* and *Centaurium spicatum* herbs used in folkmedicine. M.V.Sc.Thesis, Cairo University.
3. Ismael, L.D. 1992. Pharmacognostical Study of *Cleome* Species Growing in Egypt. M. Pharm.Sci., Thesis, Faculty of Pharmacy, Al-Azhar University.
4. Netzar, Y.; Palevitch, D.; Perl, M.; Schilcher, H.; Phillipson, J.D. and Loew, D. 1993. The effect of some plant extracts on body weight and on some biochemical activities on rats. Acta Hort. 332:207-217.

Fig. 9- *Cloeme drosearifolia* (Forssk.) Del. A. fruiting branch B. flower

C. seed.
(After: Jafri, 1977, Flora of Libya, No. 12, Capparaceae).

17. Colchicum ritchii R. Br. Denham & Clapperton, Trav. Afr. Appl. 241
(1826)

C. aegyptiacum Boiss..

Arabic :	<i>Oknah</i>	??W
	<i>Farg el ard</i>	u t?SEz
	<i>Khamirah</i>	R f?T
	<i>Khamieret Al Arab</i>	RYNE?T

Morphological description :

Small perennial herb. Corm, oblong, 20-30 cm long, with 6 brown leathery tunics prolonged above the bulb, leaves, lanceolate - linear, spreading - reflexed, the margin often smooth. Flowers, 2-8, pink, rarely white in colour, tubular, long and borne close to ground on the corm, a solid fleshy stem. After flowering a short underground stem develops between the corm and the ripening fruits, these finally appear as a terminal cluster of capsules supported by a crown of rosetted leaves. Seeds, spherical and developed with the flowers, which are up to 10-20 cm long 5-15 mm broad (Plates 31 & 32).

Ecology:

The plant has been considered to be extinct since a long time. No material was collected since a long time. However, in the present project, the field surveys showed that the plant grows in vast areas in the Mediterranean coastal zone to the south of the sea about 20 km. It grows on hard compact, stony soils. The common associate is *Haloxylon articulatum*. The community in which the plant grows is subjected to overgrazing. *C. ritchii* is not grazed, but dug by the Bedouin to be sold to traders selling it to the Alexandria and Cairo *Attarin* shops.

Distribution:

Local : The Western Mediteranean coastal region, Daba'a and Hammam.

Regional : No records

Global : No records

Status :

The plant in addition to being of limited distribution in the western coastal zone, it is dug by the Bedouin. The Bedouin use a special digger called Jazz to uproot the plant.

Part used :

Seeds and corms.

Constituents :

Alkaloid, colchicine. Colchicoside, fat, tannin, oil, and gallic acid.

Folk Medicinal Uses :

Arthritis, rheumatism, gout, abdominal colics, emetic.

Pharmacological Actions and Indication:

The exact mechanism of action of colchicine in the treatment of gout is not known. It inhibits leucocyte migration and reduces lactic acid production by leucocytes which results in a decrease of deposition of uric acid. In addition, there is a reduction in phagocytosis which decreases the inflammatory response. Colchicine is used as a suppressant for gout.

References:

Robbers, J.E.; Speedie, M.K. and Tyler, V.E. 1996. Pharmacognosy and Pharmacobiotechnology. Williams & Wilkins.

18. Commiphora opobalsamum (L.) Engl. In DC.; Monogr.Phan. 4:15
(1883)

Amyris opobalsamum L.; Amoen. Acad. 7:68 (1762)

Arabic : *Balasan*

???

Balsam Makka

?????

Basham

???

Balsam Israel

3/4???

English: Balm of Gilead, Carpobalsam, Balsam Judatum, Balsam of Mecca.

French: Baumier, Balsamier de Gilead, Balsamier de laecque, Balsam de Judée,
Balsamier de la Mecque

German: Mekka Balsambaum, Opobalsambaum

Italian : Albero balsamico, Balsam di Gillead, Balsamo della Mecca

Turkish : Belsem ag, Mekke pelseng'i ag, Balsam ag

Morphological Description:

Shrub or tree to 4 m, often with long slender drooping branches:bark grey.
Leaves 3-foliolate or pinnate with 5 leaflets, glabrous to pubescent; petiole 4-20 mm,
leaflets narrow-elliptic to obovate, entire. Flowers in 1-3-flowered cymes.

Ecology:

The plant grows on the slopes of mountains in Gebel Elba region.

Distribution:

Local : Gebel Elba

Regional : East Sudan, Somalia, Arabia

Status:

The plant is rare in Egypt and is endangered.

Part Used:

The hardened gum resin which exudes through natural fissures or incisions
made in the bark. It is known as myrrh. The myrrh occurs in brownish-yellow or

brown tears or irregular masses of a dusty appearance, generally mixed with sand and vegetable debris. It has no aromatic odour and a bitter taste.

Constituents:

It contains about 2.5 to 8 % of a volatile oil which rapidly resinifies on exposure to air. 25-40 % of a resin consisting of commiphoric and other acids, either free or combined with two phenolic resins; and 40 to 60 % of a gum allied to gum arabic. It also contains an oxidising enzyme and a bitter principle, which does not dissolve in water. Ash would not exceed 5 %.

Folk Medicinal Uses:

Antiseptic, expectorant, added to gargles and mouth washes. Myrrh is supposed to have been used by the Ancient Egyptians in the embalming process. It has been mentioned in the Old Testament. Myrrh is used in perfumery.

19. Cymbopogon schoenanthus (L.) Spreng, Spreng., Pl. Pugill. 2: 14
(1815)

Andropogon schoenanthus L. (1753)

This species is represented in Egypt by two subspecies:

subsp. *schoenanthus* & subsp. *proximus* (A. Rich.) Maire & Weiller, Fl. Afr. Nord
1: 287 (1952) (= *C. sennarensis* Hochst.; Flora 27: 243 (1844); *C. proximus* A.
Rich.; Tent. Fl. Abyss. 2: 464 (1851))

Arabic: *Idhkhir* tTT?
Tibn makkah ???r
Khilal ma'muni ??????A T

Berber: Tiberrint.

English: Camel's hay, Scenanth, Geranium grass.

French: Citronelle, Jonc odorant, Jonc aromatique, Paille de la Mecque.

German: Cameleshov, Citronengras Schoenanth.

Morphological Description:

Densely tufted perennial; culms erect, 60-130 cm high, enclosed at the base by tight bundles of old sheaths. Leaf-blades narrowly linear to filiform, up to 30 cm long, 1-3 mm wide, glaucous, asperulous. Spathate panicle oblong, 10-40 cm long; racemes 1-3 cm long, rachis-internodes and pedicels conspicuously white-woolly with hairs 3-4 mm long; pedicel of homogamous pair inflated, barrel-shaped, the lower raceme-base very short, about 1/3 as long as the pedicel (Plate 33).

Sessile spikelets narrowly lanceolate, 4-7 mm long; lower glume chartaceous, concave between the keels, glabrous or pubescent throughout, unwinged; upper lemma bidentate, the lobes up to 1/3 length of lemma body; awn 4.5-9 mm long, scarcely geniculate, the column weakly defined. Pedicelled spikelet 4-7 mm long (Plate 33).

Ecology:

The plant grows in stony habitats.

Distribution:

Local : Mainly in the Southern Eastern desert and Gebel Elba

Regional : All North African countries.

Global : Subsp. *schoenanthus*; N.Africa, the Arabian Peninsula, Somalia Djibouti, Pakistan, and India. Subsp. *proximus*: Eriteria, Ethiopia, westwards to Mauritania, Kenya, and Egypt.

Status:

The plant is collected to an extent making it endangered. In the southern part of the Eastern desert and Gebel Elba region, the plant is collected to be sold to the *Attarin* in the market. It is to be noted that huge amounts of this plant are collected from the Sudan and brought to Halaib. They are sold to the *Attarin* in Aswan and from there the plant is distributed to the different parts of the country.

The plant is endangered. It is to be noted that the ecology of reproduction of this species is not well understood. There is a great need to investigate the reproduction ecology of this species.

Part used:

Aerial parts of the plants

Constituents

It contains diterpenes, mainly poroximadiol.

Folk Medicinal Uses:

The plant is used as a weak infusion in the form of “teas” used for fever and jaundice. It is also used as diuretic, emenagogue, diaphoretic stomachic, carminative, tonic, antirheumatic, and as an antidiarrheal.

Pharmacological Actions, Indications, and Toxicity:

Extracts of the plant possess hypotensive, antispasmodic, antibacterial, analgesic and antipyretic activities.

References:

1. Duke, J.A. 1985. Medicinal Plants of China. Reference Publications, Inc. Michigan.
2. Rizk, A.M. 1986. The Phytochemistry of the Flora of Qatar. Scientific and Applied Research Centre. University of Qatar, Doha, Qatar.

20. *Cyperus rotundus* L.; Sp.Pl.;ed.1,45 (1753)

Chlorocyperus rotundus (L.) Palla, *Pycreus rotundus* Hayek

Arabic : *Sa'ad*

تصانيف

Berber : Azdjmir, Tasselbou.

English : Nut-grass.

French : Souchet rond

German : Runde Zyperwurzel

Italian : Stiancia rotonda, Ciperio orientale, Padulina

Turkish : Topolak

Morphological Description :

A perennial herb with creeping rhizomes, which produce rows of small leaf-rosettes along the ground. Stolons thin, but here and there swollen into black ellipsoid tubers, which are collected as a drug. Stem, leafy only at base, upwards ending in a simple or compound umbel of spicate spikelets. The species is extremely variable with numerous subspecies and forms.

Rhizomes are in the form of ellipsoid tubers, black coloured, with characteristic aromatic odour and taste (Fig.10, Plate 34).

Ecology:

The plant is common in cultivated fields, along roads, usually on moist ground. It is considered as a weed causing problems for cultivated vegetables and crops.

Distribution:

Local : In all the phytogeographical regions of the country

Regional : North African countries

Global : Cosmopolitan

Status:

The plant is very common as a weed in the cultivated fields. The species is extremely variable and comprises numerous forms and subspecies.

Part used :

The rhizome in the form of ellipsoid tubers.

Constituents :

Starch, volatile oil (0.5%) and resin .

Folk Medicinal Uses :

Tubers are aromatic, stomachic in nervous gastralgia, dyspepsia, diarrhoea, emmenagogue, sedative, analgesic, in dysmenorrhoea, amenorrhoea, chronic neuritis, and to increase body weight. They are used as infusion for treatment of intestinal pain, as carminative, stimulant, tonic, aphrodisiac, anthelmintic, analeptic, and to remove renal calculi. Fresh tubers are diaphoretic, astringent and for scorpion stings.

Fig. 10- *Cyperus rotundus*

(After: Boulos, 1974, Medicinal Plants of North Africa).

21. *Juniperus phoenicea* L.; Sp Pl. ed.1, 1040 (1753).

Arabic : 'Ar'ar **wtw**

Berber : Zimeba, Aibs .

English : Phoenician juniper, Juniper tree .

French : Genevrier rouge, Fausse sabine, Petron .

Description:

Small shrub or tree, cypress-like tree with erect branches. Leaves, of 2 kinds, spreading needle-like and imbricated scale-like, with a characteristic aromatic bitter taste and aromatic odour. Fruit, glossy, reddish brown, 6-14 mm across, 3-9-seeded (Fig. 11, Plate 34).

Ecology:

The plant is a Mediterranean tree. It grows in the crevices of rocky mountains of North Sinai (Gebel Halal [892 m], Gebel El-Maghara [735m], and Gebel Yelleq [1087m]).

Distribution:

Local : Mountains of North Sinai.

Regional : All North African countries.

Global : The Arabian Peninsula, Southern Europe, Asia Minor and many other areas.

Status:

The plant is very rare and new seedlings are not observed in the sites of its growth. This means that the cut plants are not replaced by others. Recently, the few individuals are subjected to cutting for medicinal uses. It is an endangered species. Perhaps conservation *in situ* is efficient. The drug in the Egyptian market is mainly imported from Libya.

Part used :

The young twigs.

Constituents :

Volatile oil and resin .

Folk Medical Uses :

Dry leaves are used to cure mild skin inflammations for babies; dilator for urinary tracts, laxative, intestinal disinfectant, emmenagogue, help childbirth by increasing the contraction of the uterus, diaphoretic, sedative and for diarrhoea.

Fig. 11 *Juniperus phoenicea* L.

After: Boiulos, 1983, Medicinal Plants of North Africa

22. *Moringa peregrina* (Forssk.) Fiori, Agr. Colon.; 5:59 (1911)

Hyperanthera peregrina Forssk, Fl. Aegypt. Arab.

Moringa aptera Gaertner, Fruct. Sem. Pl.2:315 (1775).

Arabic : *Habb El Yasar* **حبة ياسر**

Habb El Ban **حبة بن**

The seeds are known as *Habba Ghalia* **حبّة غالية**

English : Ben-oil tree, Ben nut (seed) , Moringa

French : Ben blanc, Moringe Aptere, Arbre noix de ben

German : Behenbaum, Behennuss

Morphological Description :

A tree, 3-10 m high, with erect trunk, and white bark. Leaves, 30 cm long, imparipinnate with early deciduous leaflets. The leaf is formed of 3 pairs of long, slender junciform pinnae looking like opposite virgate branches. Leaflets, remote, small, oblong. The flowers appear before leaves in May. The pendulous pods ripen in October. The pod is pendulous and contains angled, nut-like white seeds (behen nuts) which are of bitter sweet taste and rich in oil (ben oil). Flowering and fruiting: February - April (Fig. 12, Plate 35).

Ecology:

The plant grows on steep slopes of the mountains in Sinai and the Red Sea zone. The plant is confined to the feet of the mountains that are higher than 1300-1500 m above sea level.

Distribution :

Local : Sinai, South Eastern Desert, Red Sea region and Gebel Elba

Regional : No records in the other North African countries.

Global : Ethiopia to Somalia, northwards to the Sudan and eastwards to Arabia.

Also recorded from Palestine and Jordan.

Status :

Vulnerable.

Part Used :

Seed and oil obtained from the seeds.

Constituents:

Oil similar to olive oil in its fatty acids composition. The refined oil obtained from the seeds has a yellowish colour, a sweet taste and is odourless, for which it is much esteemed for preparing cosmetics. The oil known as *Oleum Behen Balaninum* is pharmacopoeial in many pharmacopoeias.

Folk Medicinal Uses:

To treat headache, fever, abdominal pain and constipation, burns, back and muscle pains and during labour in childbirth. The ben oil has been used by the Egyptians since Old and Middle Kingdoms (3000-2000 B.C.)

References :

1. Miller, A.G. and Morris, M. 1989. Plants of Dhofar, the Southern Region of Oman. Traditional economic and medicinal uses. The Office of the Advisor for Conservation of the Environment, Diwan of Royal Court, Sultanate of Oman.
2. Morton, T. 1991. *Economic Botany*. **45** (3): 318-333.

Fig. 12- *Moringa peregrina*
(After: Täckholm, 1974, Students' Flora of Egypt)

23. Origanum syriacum L. Sp.Pl.;ed.1,590 (1753)

Origanum viridis L.; Sp.Pl.;ed.2,804 (1763),

Mentha undulata Willd.; Enum. Pl.Hort. Berol. 608 (1809).

Arabic : *Bardaqaash*

u ?atr

Za'atar

twU

Morphological Description :

Leaves, nearly sessile, green, densely hairy, about 1 cm long, and 0.5 cm broad, with characteristic aromatic odour (of Mint smell) and taste. Bracts, small, 4-ranked, white-canescens. Flower heads, often cylindrical, paniced (Plate 35)

Ecology:

The plant is rare and grows in rocky habitats in the mountains of Sinai

Distribution:

Local : Sinai

Regional : Only in Egypt

Global : The countries of the Middle East.

Status:

The plant is vulnerable.

Part used :

The leaves or the whole herb.

Constituents:

Volatile oil consisting of more than 80% carvacrol, resin and flavonoids.

Folk Medicinal Uses :

Dry leaves are used as spice, condiment and to relieve pain. Fresh herb is used with sesame seed and olive oil with sugar to make a special dish.

24. *Peganum harmala* L.; Sp.Pl.;ed.1, 444 (1753)

Arabic :	<i>Harmal</i>	٣/٤٦ Š
	<i>Sadhab barri</i>	?t RTU
	<i>Ghalgat edh dhi'b</i>	Ro٣٤Z

- English :** Harmel, Syrian rue, Wild rue.
French : Hermale, Harmel, Rue Sauvage.
German : Gemeine syrische Raute, Wild Raute.

Morphological Description:

A glabrous perennial plant with numerous herbaceous forked-corymbose stems from a shrubby base, 75 (–100) cm tall. Leaves, sessile, 6 (10) cm long, irregularly dissected with acute linear lobes. Flowers, large, terminal, solitary pedicellate and white in colour. The inflorescence is a cymose which is a compound monochasial scorpioid. The pedicel is angular and green in colour. The flowers are actinomorphic, hermaphrodite. The fruit is a stalked 3-valved loculicidal capsule derived from trilocular superior ovary. The fruit is globular in shape, 6-10 mm in diameter. It contains numerous small dark brown, reticulately pitted, 3-4 mm long seeds arranged on axile placenta (Fig. 13 , Plate 36).

The plant flowers from April to October and bears fruits from April to November

Ecology:

The plant is common in the northern coastal region, where it grows in neglected areas and disturbed ground as well as along the roads. It occupies niches that receive runoff water in addition to the recorded rainfall. The plant, being unpalatable, is not affected by grazing. However, the human activities affecting its habitat would be the main reason of the disappearance of the plant from many localities.

Distribution:

Local : The Mediterranean coastal strip from El-Salloum to Rafah. The Isthmic desert, Sinai

Regional : All the North African countries from Egypt to Morocco.

Global : South Europe, Asia Minor, Middle east, South Russia, Iran, Afghanistan, Pakistan, Kashmir, Tibet, India, Mexico, Western Asia, North and Latin America.

It is considered as a common cosmopolitan weed of waste places, occurring in arid and semi-arid regions up to 4000 m.

Status:

The plant is not endangered. However, there is a great need to investigate the methods of cultivating the plant to satisfy the needs for folk or other uses.

Part used:

The dried ripe seeds of *Peganum harmala* L.(family *Zygophyllaceae*). Sometimes, leaves and flowers are also used.

Constituents:

Lipids (13.3%), β -sitosterol and ? -amyrin, harmine, harmaline, harmalol and peganine.

Folk Medicinal Uses:

Leaves and flowers are used for rheumatism and stomach problems. Seeds are used as an anthelmintic and as a narcotic.

The leaves are rubbed on joints for rheumatic pain. A tea made from leaves is used as an anthelmintic. A tea made from blossoms is taken for stomachache. Ground seeds mixed with senna and honey are used for stomach ache, or mixed with black pepper and applied on painful joints. Seeds are powdered and a decoction made with water taken orally as a vermifuge, narcotic and for removing kidney stones. In far east countries (mainly in Pakistan) powdered seeds are used for asthma, colic, jaundice and as an anthelmintic against tapeworms. A decoction of seeds is given for laryngitis. It is also recorded to increase the flow of milk in new mothers; also used as abortifacient. The smoke is considered antiseptic and wounds are fumigated by burning seeds and leaves and letting the smoke pass over them.

Pharmacological Actions, Indications and Toxicity:

Extracts prepared from various organs of the plant were inactive against Ehrlich ascites carcinoma *in vitro*.

Extracts containing harmine were active against *Bacillus subtilis*, *Staphylococcus aureus* and *Escherichia coli*.

Seeds possess undoubted hallucinogenic compounds and said to be aphrodisiac, anthelmintic, lactagogue, stimulant to CNS followed by paralysis, emetic, diuretic, vapors of burnt plant for headache, hemorrhoids, depurative, rheumatism, analgesic, alopecia, asthma, roasted seeds for indigestion and diabetes, infusion of seeds for cardiac disorders.

Authentication:

- 1- Macro and microscopically.
- 2- Alkaloid not less than 15% in seeds.
- 3- Foreign organic matter not more than 2%.
- 4- Loss on drying not more than 10%.
- 5- Ash not more than 10%.

Reference :

1. Hilal, S.H.; Haggag, M.Y.; Soliman, F.M. and El-Kashoury, S. 1978. Alkaloids of *Peganum harmala* L. Egypt. Pharm.Sci. **19**(1-4):393-399.
2. Hilal, S.H.; Zedan, H.H.; Haggag, M.Y.; Soliman, F.M. and El-Kashoury, E.A. 1979. The antimicrobial and anticancer activity of *Peganum harmala* L.; Egypt. J. Pharm.Sci. **20**:193-197.

Fig. 13- *Peganum harmala* L.

(After: Boulos, 1983, Medicinal Plants of North Africa).

25. *Pluchea dioscorides* (L.) DC.; Prodr. 5:450 (1836)

Baccharis dioscorides L.; Cent. Pl. 1:27 (1755)

Conyza dioscoridis (Linn) Desf.; Tabl. Ecol. Bot. Ed, 114 (1815)

Baccharis aegyptiaca Forssk. Ex DC.; Prodr. 5:450 (1836)

Arabic: *Barnoof*

??r

English: Ploughman's spikenard

French: Conyze

German: Doerrkraut

Italian: Coniza

Turkish : Barnuf, Kenevir otu

Morphological Description:

Richly branched hairy shrub, often 2-3 m high, with lanceolate acute, serrate leaves. Heads numerous, corymbose, terminating the leafy branches. Flowers pale yellow or pink (Plate 37).

Ecology:

The plant grows on fine loamy soils in moist habitats, especially along the canals, the streams and the Nile branches.

Distribution:

Local : Mainly in the Nile region. It occurs in the Mediterranean region, the oases, and parts of the north Arabian desert.

Regional : Egypt

Global : Tropical Africa, Saudi Arabia, Palestine.

Status :

The plant is common.

Part Used:

The aerial parts of the plant.

Constituents:

A crystalline bitter principle "conyzin" from the leaves. P-?-hydroxysantamarin, santamarin, 11- β , 13-dihydro, P-?-hydroxysantamarin, P-angeloyloxy ludovicin, p-isovaleryloxy ludovicin, 3-methylvaleryloxy ludovicin. 1- β -angeloyloxy-q-A-hydroxy-A-cyclocostunolide. Quercetin-4-methylether and quercetin-3-xyloside, quercetin, quercetin-7-arabinoside and quercetin-3-rhamnoside, 3-7-disulphates of quercetin, isorhamnetin, kaempferol-3-rutinoside, quercetin-3-O- β -D-glucoside, apigenin-6, 8-di-C-glucoside. β -amyrin, β -amyrin acetate. Octacosanol, hexacosanol, tetracosanol. Stigmasterol, campesterol, cholesterol. A volatile oil.

Folk Medicinal Uses:

Ibn El Bitar and Al Antaki reported the use of *Barnoof* in the treatment of epilepsy in children, in colic, as carminative and as remedy for cold.

A *Conyza* species, namely, *C. figinoids* DC (Hiero) is used in Mexico in the treatment of certain types of tumors. The plant is used in the treatment of diarrhoea, colic and rheumatic pains.

Biological Activities:

The following biological activities were reported for certain *Conyza* species, other than *C. dioscoridis* :

1. Insecticidal activity exhibited by the aqueous extract of *Conyza chinensis* towards american cockroach and house fly.
2. Insect repellent activity demonstrated by fresh leaves of *C. lyrata* towards mosquitoes.
3. Slight antibiotic action shown by extract from *C. cinerea* L.
4. Molluscicidal activity demonstrated by extract from the twigs of *C. pauciflora* Willd.

Economic Potential:

The plant has good reputation in folk medicine. Its marketing is local and depends on collection from the wild.

References:

1. Boulos, L. and El-Hadidi, N. 1984. The Weed Flora of Egypt. The American University Press, Cairo.
2. El Hefnawy, H.M. 1990. A Pharmacognostical study of certain *Conyza* and *Cosmos* species (Family Compositae) growing in Egypt “; M. Pharm. Thesis, Faculty of Pharmacy, Cairo University.
3. Ibn El Bitar. 1890. “ Mofradat Al Adwiah wal Aghzia “, Boulac Press, Egypt.

26. Posidonia oceanica (L.) Del.; Descr. Egypte, Hist. Nat. 78 (1814)

Zostera oceanica L.; Mant. 123 (1767)

Arabic: *Rigle Al Asad* **تۇڭەت**

Morphological Description:

Submerged robust marine plant with thick fibrous creeping rhizomes and long, strap-shaped rosetted leaves upto 50 cm long, 7 mm broad, with round apex and brown empty basal leaf sheaths soon becoming fibrous. Inflorescence peduncled, consisting of several spikes with large bracts. Flowers naked, partly male, partly bisexual of three stamens and a pistil. Fruit a detached and floating drupe, indehiscent or splitting from the base into 2-3 valves.

The leaves are constantly washed up on the beach together with peculiar felt balls “pilea marinae”, formed by their fibre by the action of their waves (Fig. 14, Plate 37).

Distribution:

Local : Along the western Mediterranean coast, the fibrous balls are common on the white pseudo-ooitic sand dunes.

Regional : Along the coast of the North African countries

Global : In the Mediterranean Sea.

The dried herb is sold in the *Attarin* shops in Cairo. However, the sellers do not give clear answers about its uses. This plant needs further investigations. It is said that it is used in treating obesity.

Folk Medicinal Uses:

It is used in treatment of obesity.

Fig. 14- *Posidonia oceanica* (L.) Del.
(After: Täckholm, 1974, Students' Flora of Egypt).

27.Primula boveana Duby, in A.DC.; Prodr.; 8:35 (1884).

An Endemic Species in Sinai.

English : Paigle, Peagle.

French : Primeyere.

German : Aurikeln.

Morphological Description :

A perennial herb with thin, sharply incised serrate leaves. The leaves are mealy beneath, the lowermost rosetted, the upper ones in distant whorls; both surviving throughout the year. Flowers, lemon- coloured appearing from February to May, occasionally even in summer. Seeds minute and referred to as “dust seeds”. The plant is rare, endemic to Sinai Region where it grows near wells in Gebel Musa, Gebel Safsaf, Gebel Serbal and Gebel Umm Shaumar, mainly in north- facing hills.

Habitat :

Rocky ridges and mountains in Sinai.

Distribution :

Endemic, recorded only in Sinai, Egypt.

Parts Used :

a. The flower

Latin : Flores Paralyseos.

English : Paigle(s), Peagle.

French : Fleurs de Primevère officiale.

German : Primelbluten, Schlüsselblumen.

Obtained from *Primula veris* L. (syn. *P. officinalis* (L.) Hill) or *P. elatior* (L.) Hill.

The drug consists of either the entire flowers or only of the petals, stamens and ovaries. Corolla, 15 mm long tube, light yellow to brownish with lemon- yellow margin, terminates in 5 obcordate lobes (after soaking with water) which have an orange yellow spot at the base that fades on drying,

Margin and lobes may be partly green. Calyx, greenish-brown with 5 prominent ribs and short pointed teeth. Odour, faint, characteristic, reminiscent of honey; taste, faintly sweetish.

b. The root

Latin	: <i>Rhizoma Primulae, Radix Paralyseas.</i>
English	: Primula Root.
French	: Racine de Primevère officinale.
German	: Primelwurzel, Schlüsselblumen Wurzel.

Obtained from *Primula veris* L. (syn. *P. officinalis* (L.) Hill) and *P. elatior* (L.) Hill.

The drug consists of rhizomes and roots. Rhizome, 2-5 mm thick, 1-5 cm long, densely covered with roots, greyish brown, tortuous, verrucose and tuberculate. Roots, 1mm thick, several cms long, whitish yellow or pale to reddish brown, brittle, with inconspicuous longitudinal grooves. Odour, faint, characteristic, reminiscent of methyl salicylate (*Primula elatior*) or anise (*Primula veris*). Taste, obnoxiously irritating.

Constituents :

A- Flower :

Small amounts of saponins (mainly primula acid) in the sepals (up to 2%). Flavonoids in other parts of flower comprising gossypetin, kaempferol dirhamnoside and 3- gentiotrioside, quercetin. Carotenoids. Traces of essential oil. enzymes (primverase).

B- Root :

Five to ten percent triterpenoid saponins. Phenolic glycosides, especially primulaverin (primulaveroside) which on enzymatic degradation (during drying) yields the characteristic aroma substances of the plant (e.g methyl -methoxy-salicylate). Rare sugars and sugar alcohols. Small amount of tannin.

Pharmacopoeias :

- DAB 10 (1991/1992)- BHP (1993)- OAB

Authentication :

A-Flower :

1- Macro- and micromorphology.

- 2- TLC for flavonoids.
- 3- Green flowers not more than 30 %
- 4- Ash not more than 8%.
- 5- Foreign matter not more than 2%
- 6- Loss on drying not more than 12%

B-Root :

- 1.Macro- and micromorphology.
- 2.TLC for saponins.
- 3.Foreign matter not more than 2%
- 4.Loss on drying not more than 10%
- 5.Ash not more than 11 %

Adulterants and Substitutes :

A- Flower :

The flowers of *P. elatior*.

B- Root :

Roots and rhizomes of *Viracetoxicum hirundinaria* Medikus. (syn. *V. officinale* Moench) (*Asclepiadaceae*) colour detected by tests and TLC.

Folk Medicinal Uses:

A- Flower :

As a nervine for headache, neuralgia, shaking of the limbs, as a “heart tonic” in vertigo and cardiac weakness.

B- Root :

As secretomotor and secretolytic expectorant in bronchitis, catarrh of the respiratory tract, coughs, colds and phlegm in the broncho-pulmonary system.

References :

1. Langhammer, L.1964. Dtsch. Apoth. Ztg. **104**: 1183.
2. Stahl, E.1973. Arch. Pharm. (Weinheim) **306**: 693.
3. Wagner, H.; Blatt, S. and Zginski, E.M. 1984. Plant Drug Analysis, Springer Verlag, Berlin, Heidelberg, New York, Tokyo.

28. *Rumex vesicarius* L.; Sp.Pl.; ed. 1, 336 (1753)

Arabic : *Hommad* u اءس

Henbiet uffءس

Berber : Brisemmou , Tasemmunt

English : Sorrel, Bladder dock

French : Oseille suave, Oseille d'Amérique

German : Amerikanischer Sauerampfer

Italian : Acetosa d'America, Romice d'America

Turkish : Humed Otu

Morphological Description:

An annual, glabrous herb, with erect to ascending stem, branching from base. Leaves fleshy, petiolate, ovate-deltoid, obtuse, entire. Flowers, bisexual, greenish to purplish. Fruit, perianth winged, entire, purplish-red-veined. Flowers from March to April (Plate 38).

Ecology:

The plant grows in sandy habitats. It occurs usually in depressions, especially along roadsides, where runoff water collects with the fine sandy deposits.

Distribution :

Local : All over the different phytogeographical regions of Egypt.

Regional: All the North African countries.

Global : Widespread, especially in Arabia.

Part used :

The entire plant

Constituents:

It contains flavonoid C-glycosides: Vitexin, Isovitexin, Orientin and Isoorientin, and the anthraquinones: Emodin, and Chrysophanol.

Folk Medicinal Uses:

It is used for hepatic diseases, constipation, calculi and bad digestion. It is cooling, laxative, stomachic, tonic and analgesic. It is used for heart troubles, pains, tumors, diseases of the spleen, hiccough, flatulence, asthma, bronchitis, dyspepsia, vomiting, piles, scabies, leucoderma, toothache, appetizer and diuretic.

Substitutes :

The whole plant of *Rumex pictus* Forssk. which is a small often procumbent, reddish plant with pinnatifid lower leaves. Flowers, in a leafless terminal raceme. Fruit perianth, winged. *R. pictus* is an esteemed green vegetable in the Arab Gulf countries. It is collected in spring time and eaten fresh.

References:

Rizk, A. M. and El Ghazaly, G. A. 1995. Medicinal and Poisonous Plants of Qatar. Univ. of Qatar, Doha.

29. *Salvadora persica* L.; Sp.Pl.; ed. 1,122 (1753)

Arabic: *Arak*

؟œ؟

Meswak

؟œU？

The fruits are known as *Kabath*

Sœ？

Berberer: Tidjat, Adjou, Abisga, Babul

English: Toothbrush tree

French: Arac, Méswak

German: Senfkom

Turkish: Arak

Morphological Description:

Glabrous shrubs, as man's height or more, with white branches. Leaves opposite, short-petioled, acute entire, coraceous, oblong, 5-8 cm long, glabrous. Racemes form a spike-like panicle. Calyx bell-shaped; corolla yellowish-red, twice as long as the calyx, with revolute lobes (Plates 38 & 39).

Part Used:

Pieces of the underground stolons (sometimes the branches) of variable size (5-20 cm long, 0.5-1.5 cm diameter) with buff to bright brown colour and pungent characteristic taste when fresh, known as siwak or miswak (Plate 38).

Constituents:

Sulfur glycosides.

Folk Medicinal Uses:

It is used for gonorrhoea, spleen, boils, sores, gum disease and stomachache. It is used for bites of poisonous animals. The wood boiled in oil and used as linament for contusions. Leaves are used antisyphilitic. Leaves, roots, bark and flower contain a diuretic oil. Fruits are edible, stomachic, carminative, febrifuge and appetizer.

The use of the miswak is recommended by the **Prophet MOHAMMED** (Peace be upon Him), specially before each prayer of the five prayers every day. The recent studies proved its efficiency in cleaning the mouth, teeth and gums. Some

companies produced tooth-paste preparations containing the extract of the arak, called in the market as *Miswak* (see Batanouny, 1986).

30. *Solanum nigrum* L.; Sp.Pl.;ed.:1,186 (1753)

Arabic:	Enab edh dhi'b	رَوْبِيْ
	Enab eth tha'lab	رَبِيْ
	Rbriq	رَبِيْ

Berber: Touchanina, Tiourmi, Azouri imouchene.

English: Black nightshade, Hound's-berry.

French: Morelle noire, Amourette, Creve chien.

German: Schwarzer Nachtschatten.

Morphological Description

An annual herb, up to 40 cm high (sometimes up to 1 m), with spreading branches; stems mostly smooth or younger ones slightly hairy. Leaves are alternate to each other; oval-shaped and narrower at each end with mostly smooth edges. Flowers are rather unique, wheel-shaped, white or yellowish white and umbrella-shaped as they hang from plants. Fruits are round, fleshy dark violet berries, about 6 mm in diameter (Fig. 15, Plate 40).

Ecology:

The plant is a weed growing in moist places in gardens and orchards. In regularly irrigated fields, the plant attains heights of one metre.

Distribution:

Local : The plant has a wide geographical distribution in Egypt. It grows in all the phytogeographical regions of the country. It should be noted that it is very common in irrigated areas, especially the Nile Delta in the Nile Valley. Newly reclaimed lands in the desert are infested by this weed.

Regional : All the North African countries.

Global : A cosmopolitan weed

Status:

The plant is widespread and is not endangered.

Part used:

Leaves and green unripe fruits.

Constituents:

The plant contains solasodine glycosides. Solanine, solamargine and other solanigrines which are steroidal in nature. The berries contain 15-20% glucose and fructose, vitamin C and carotenes. Unripe berries are reported to be poisonous, while ripe berries are edible.

Folk Medicinal Uses

Leaf, root and stalk used for cancerous sores, leucoderma and wounds. Stem: young shoots eaten as pot herb, considered tonic for virility in men and for dysmenorrhea in females, for dysentery, sore throat, whitlow.

Plant, Diuretic, febrifuge, decoction of the whole plant for abscesses, cancer of the cervix inflammation, leucorrhea and open sores, for dermatitis, diarrhea, heavy female discharges, and sore throat. Berries, narcotic, analgesic, if used externally sedative, seeds aphrodisiac (mixed with food).

Toxicity

Unripe fruits are poisonous. In both man and animal the toxic symptoms are stupefaction, staggering, loss of speech, feeling and consciousness, cramps, dilation of the pupil and sometimes convulsions. Death is rare and is apparently by respiratory paralysis.

References :

1. Bliss, B. 1973. Chinese medicinal herbs. Georgetown Press, San Fransisco.
2. NAS.1975. Herbal pharmacology in the People's Republic of china. A Trip Report of the American Herbal Pharmacology Delegation.National Academy of Sciences, Washington D.C. 269 pp.
3. NIH. 1924. A Barefoot Doctor's Manual [Translation of a Chinese instruction to certain chinese health personnel]. John E. Fogarty International Center. National Institute of Health, Washington, DC. DHEW publication No (NIH) 75-695.
4. Perry, L.M. 1980. Medicinal Plants of East and Southeast Asia , 620 pp, MIT Press. Cambridge, Mass.

Fig. 15- *Solanum nigrum* L.

(After: Siddiqi, 1978, Flora of Libya, No. 62, Solanaceae)

31. Solenostemma arghel (Del.) Hayne, Getrue Darstell.Gew. 9,t.38
(1825)

Cynanchum oleifolium Nectoux, Voy. Egypte 20 (1808)

Solenostemma oleifolioum (Nectoux), Bullock & E.A. Bruce, Kew Bull. 8:329
(1953)

Arabic : *Harggal*

٣/٤ ش ش

Berber : Khallachem, Zellechem, Arellachm

English : Argel, Arghel

French : Solenostemma, Arguel

German: Arghelsenna

Italian : Solenostemma

Turkish : Argal

Morphological Description:

Erect perennial undershrub, reaching up to 60 cm high. Leaves opposite, decussate, lanceolate to oblong-ovate, with acute to subacute apex, cuneate base. The inflorescence is cymose. Bracts broad, linear-lanceolate, acute. Flowers white. Fruit a follicle, 5 cm long, 17-18 mm broad, ovoid lanceolate and acuminate at the apex. It is very hard and dark purple. Seeds are turgid, ovoid, channelled down one face, minutely tuberculated, bearing one apical tuft of hairs (Plates 40 & 41).

Ecology:

The plant grows on pebbly habitats in the wadis of Sinai and the Southern Eastern Desert.

Distribution:

Local : Sinai and the Southern Eastern (Arabian) Desert

Regional: Egypt, Libya and Algeria,.

Status:

The plant is endangered. It is heavily collected from its natural habitats to be sold in the *Attarin* shops all over Egypt. Large amounts of the leaves are imported from Sudan.

Part Used:

Dried leaves

Constituents:

Sitosterols, choline, flavonoids, glycosides, namely argelin and argelosid and a triterpenoid saponin.

Folk Medicinal Uses:

For cough, infusion of leaves for gastro-intestinal cramps, stomachic, anticolic, for colds, urinary tract, antisyphilitic if used for long period of 40-80 days.

References :

1. El-Fishawy, A.M, 1976. A pharmacogostical study of *Solenostemma argel* Hayne growing in Egypt. M.S. Pharm. Thesis, Faculty of Pharmacy, Cairo University. pp.402.
2. Osborn, D.J. 1968. Notes on medicinal and other uses of plants in Egypt. Economic Botany, **22**: 165-177.

32. **Teucrium polium L.**; Sp.Pl.;ed.1,566 (1753)

Arabic : *Ja'ada*

RYS

English : Mountain germander, Cat thyme, Hulwort.

French: Pouliot de montagne, Germandrée en capitule, Polium, Germandrée tomenteuse, Germandrée polium.

German : Poleigamander, Berggamander

Italian : Polio, Camendrio di montagna, Timo bianco, Polio primo, Teucro tomentose, Canutola.

Morphological Description

Is a perennial herb having a pleasant aromatic odour and a bitter taste. It flowers from March to April. It has a tap root with many lateral branches, with dark and wrinkled surface. The herb has a cylindrical stem monopodially branched with short internodes.

Both stem and its branches are white in colour. Leaves are opposite decussate, exstipulate, sessile having aromatic odour and bitter taste. Lamina is oblong to linear with curved wings, base symmetric, margin crenate and venation pinnate reticulate. Both surfaces are hairy, the upper one is dark green and lower one is whitish green, inflorescence is verticillaster (Plates 41 & 42).

Ecology:

The plant grows in rocky habitats and compact fine-textured soils with stones and pebbles.

Distribution:

Local : The Mediterranean zone, the deserts and Sinai.

Regional : All north African countries.

Global : Arabia.

Status:

The plant is overcollected to be used in folk medicine. It is threatened

Part used :

Stem and flowering tops.

Constituents :

Diterpenoids: picropolin, 6-acetyl picropolin, isopicropolin, 19-acetylnaphalin, teucrins P₁, P₂ and P₃, montanin, teupolins I-V. Iridoids, flavonoids, hedragenin, ursolic acid, ? - and ? -amyryns, and volatile oil.

Folk Medicinal Uses:

Hot infusion of tender parts of plant taken for stomach and intestinal troubles, plant used in a steam bath for colds and fevers, useful against smallpox and itch, infusion vermifuge, stimulant, depurative, for feminine sterility, colds and tonic, astringent, vulnerary. In Egypt, it is used as appetizer, expectorant and hypoglycaemic.

Pharmacological Actions and Indications:

The aqueous extract possesses a hypoglycaemic effect. Flowers and leaves of the plant possess conductolonic effect. It also stimulates the neuromotor centers for uterine and intestinal musculature. The plant shows antimicrobial activity against *Bacillus subtilis* and *Staphylococcus aureus*.

References:

1. Bellakhdar, J. 1978. *Medicine tradition et toxicologie ouest - saharienne contribution a l'étude de la pharmacopée marocaine*. Edition techniques Nord - Africaines.
2. Lemordant, D.; Boukef, K. and Bensalem, M. 1977. *Plantes utiles et toxiques de Tunisie*. *Fitoterapia* **48** : 191-214.

33. *Thymus bovei* Benth.; Lab.Gen.Sp. 342 (1834)

Arabic: *Za'atar* **trwU**

English: Thyme

French: Herb de thym

German: Thymian

Morphological Description:

Woody aromatic undershrub, up to 30 cm high. Stems much branched. Leaves short-petioled, dotted (reddish) and glabrous on both surfaces, lanceolate to oblong-linear, with acute apex. Flowers purple in 6-flowered verticillaster.

Ecology:

The plant is a chasmophyte growing in rocky habitats, usually in limestone wadis.

Distribution:

Local : Confined to the Isthmic desert (Gebel El Maghara, N. Sinai) and Galala mountains in the north Eastern (Arabian) desert.

Regional: Egypt.

Global : Recorded in Palestine.

Status:

Vulnerable, in view of its limited geographical distribution. Bedouin collect the plant as a spice. Cultivation of the plant in botanical garden is the proper way for its conservation.

Part Used:

The aerial parts of the plant.

Constituents:

The flowering herb of *Thymus bovei* Benth.; yields 1.75% of a pale yellow volatile oil with characteristic aromatic thymol-like odour and pungent taste. Components of the oil comprise hydrocarbons (15.93%), phenols (71.87%),

alcohols (2.35%), esters (3.74%), oxides (1.06%), ethers (0.15%), and aldehydes (0.05%). Because of the high thymol content (68.4%) and low carvacrol content (3.47%), the oil is similar to that of *Thymus vulgaris* L. but it differs from the volatile oils of all other *Thymus* species.

Folk Medicinal Uses:

Because of its spasmolytic action, it is an important stomachic and carminative. It is also used as a diuretic, urinary disinfectant and vermifuge.

Biological Activities:

The herb is used internally, because of its essential oil content, as expectorant and bronchospasmolytic, e.g. in acute and chronic bronchitis, whooping cough, and generally in catarrh of the upper respiratory tract. The essential oil of the plant exhibited a remarkable broad spectrum antimicrobial activity due to its high phenolic content, which explains the favorite use of the plant by the natives for treatment of gastrointestinal infections. Externally, thyme is used as an antibacterial and also deodorizing agent in inflammation of the mouth and throat (as a mouth wash and gargle) and as rubefacient in frictions, bath additives and in potpourri.

Economic Potential:

Thymus bovei Benth.; as well as the essential oil obtained thereof, can be recommended to substitute the herb of *Thymus vulgaris* and its essential oil as a flavouring, disinfectant and antiseptic agent in pharmaceutical preparations, food products, soaps and deodorant industries. Therefore, the plant is of growing economic potential and attention has to be directed towards its propagation.

References:

Aboutabl, E.A.; Soliman, F.M.; El-Zalabani, S.M.; Brunke, J. and El-Kersh, 1986. Essential Oil of *Thymus bovei* Benth. Sci. Pharm. **54**:43-48.

34. Thymus capitatus (L.) Link.; Fl.Port. 1:123 (1809)

Saturejia capitata L.; Sp.Pl.;ed.1, 568 (1753)

Coridothymus capitatus (L.) Rchb.f. Oesterr. bot. Woichenbl. 7:161 (1857)

Arabic : *Za'atar* **twU**

English : Headed thyme

French : Thym de Crete

Morphological Description:

Densely glandular-dotted dwarf undershrubs. Branches thick, white, somewhat spinescent. Leaves small, opposite, entire, linear, with margins turned upwards. Flowers in terminal heads (Plate 43).

Ecology:

The plant is a chasmphyte growing in the crevces of the rocky ridges.

Distribution:

Local : The western Mediterranean coastal region

Regional : All the north African countries

Status:

The plant is endangered. It is collected by the Bedouin for tea making. The plant is becoming more rare in the last decades after the construction of the summer resorts. The ridges supporting this species have been quarried for brick making. The habitat of the plant has been eradicated. There is a great need to cultivate the plant.

Folk Medicinal Uses:

In addition to being boiled as refreshing drink, the Bedouins collect this plant to use it in stomach diseases and cough.

There is a third species of *Thymus*, namely *Thymus decussatus* Benth.; Lab.Gen.Sp.342 (1834).

This species is endemic and occurs only in Southern Sinai. The plant is a chasmphyte growing in rocky areas, especially wet sites. The plant is collected for its aromatic odour due to the oils present in its leaves. It is used as a spice and a

Constituents:

The plant contains several sapogenins and flavonoids. Sapogenins: diosgenin, tigogenin, ruscogenin, hecogenin, gitogenin, chlorogenin and 25-D-spirosta-3,5-diene. Flavonoids: quercetin, kaempferol, and several glucosides of kaempferol, quercetin and isorhamnetin.

The plant also contains alkaloids (harman, harmol, and harmine; oligosaccharide (tribulosin) and sterols.

Folk Medicinal Uses:

Flower: for leprosy; stem : for scabious skin diseases and psoriasis. Fruit: for congestion, headache, hepatitis, impotence, liver, ophthalmia, stomatitis, vertigo, recommended for kidneys, liver and vision. Seed: as abortifacient, aphrodisiac, astringent, diuretic, tonic, for abscesses, anaemia, coughs, fluxes, haemorrhoids, spermatorrhea and stomatitis. Plant is recommended as anticancer. The leaf is eaten as a pot herb in West Africa.

Pharmacological Actions, Indications and Toxicity:

The plant is poisonous to sheep and goats. It produces hepatogenic photosensitivity in livestock. Ether extract of the plant possesses juvenile hormone effect on penultimate instar of *Dysdercus cingulatus* and increased doses result in the increased mortality and development of adults with crumpled wings. The plant possesses anticancer activity. The extract of the plant is antispasmodic. The aqueous extract of the plant lowers experimentally induced hyperoxaluria.

References:

1. Duke, J.A. and Ayensu, E.S. 1985. Medicinal Plants of China . Reference Publications Inc.; Algonac, Michigan.
2. Rizk, A.M.1986. The phytochemistry of the Flora of Qatar. Scientific and Applied Research Centre. University of Qatar.
3. Sangeeta, D.; *et al.* 1993. Phytotherapy Research. **7**, 116-119.
4. Zafar, R. and Nasa, A.K.1987. Quercetin and kaempferol from the fruits and stem of *Tribulus terrestris* L.Indian J. Nat. Product, **3**(2): 17-18.

36. *Urtica pilulifera* L.; Sp.Pl.;ed.1,983(1753).

Arabic : *Qorreis* **u f?**

Horreiq **f š**

English : Roman nettle.

French : Ortie romaine, Ortie, Ortie rude, Ozomaine.

Berber : Imereksin, Imezri, Timezrit, Mezri, Tezzount.

German : Pillen Nessel.

Italian : Ortica romana.

Turkish : Isirgam otu.

Morphological Description:

Annual tall herb with large, opposite, broad leaves. Leaves serrate, beset with stinging hairs. Flowers monoecious, small green. Male flowers spiked, female flowers in globose heads, about 1 cm in diameter, hanging on a 2-3 cm long peduncle (Fig. 16).

Ecology:

The plant is a common weed in the cultivated land.

Distribution:

Local : The Mediterranean region and the Nile Delta.

Regional: All North African countries.

Global : Widespread in various countries.

Status:

The plant is a fairly common weed.

Part Used:

The herb and the seeds.

Folk Medicinal Uses:

It is used for curing sore joints by mixing the plant juice with oil. The contents of the stinging hair provide a cure for rheumatism, hemorrhage. Decoction of the summits of the plant is diuretic, depurative. Seeds are used for renal stones and

inflammation of the bladder, diuretic and aphrodisiac. The seeds known as *Bizr Anjora* have been known by the Moslem Scholars as aphrodisiac.

Fig. 16- A- *Urtica pilulifera* L. B- *Urtica urens* L.

(After: Täckholm, 1974, Students' Flora of Egypt).

37. *Urtica urens* L.; Sp.Pl.;ed.1 984 (1753)

Arabic : *Horreiq* ġ f š
 Qorreis f ?
 Sha'ar El-agouz U?SYOU

English : Small nettle, Dwarf stinger.

French : Petite ortie, Ortie Brûlante, Ortie grièche.

Berber : Timezrit, Harrous, Iherriqet.

German : Kleine Nessel.

Italian : Piccola ortica, Ortica ardente, Ortica pungente.

Turkish : Küçük isirgan otu.

Morphological Descriptin:

Annual small herbs branching from the base. Leaves opposite, beset with stinging hairs, acutely incised-dentate. Flowers are monocious, small, green. Male flowers simple, usually shorter than the petiole, less numerous than the female ones (Fig. 16, Plate 43).

Ecology:

The plant is a very common weed in the cultivated land.

Distribution:

Local : The Mediterranean region, The Nile region, some desert areas where cultivation occurs.

Regional: All North African countries.

Global : Almost a cosmopolitan plant.

Status:

The plant is a very common weed.

Part used :

Aerial parts and leaves, seeds are used also.

Constituents :

Leaves contains formic acid.

Folk Medicinal Uses:

The plant is used to treat rheumatism. It is aphrodisiac, useful for heamorrhage, kidney ailments. It is also diuretic, in eczema, dysmenorrhoea, Externally, it soothes wounds and ulcers. The entire plant especially on contact with its stinging hairs causes skin irritation, several rashes with itching (urticaria).

diseases and ulcers. An infusion prepared from the fruits is used as febrifuge, emollient, laxative. It is a reputed remedy for measles, bronchitis, cough, and tuberculosis. Powdered seeds are mixed with lemon juice for liver complaints and anxiety. An infusion is prepared from the flowers for eye wash and a febrifuge. A decoction of the bark is used for venereal diseases. The root juice is used for arthritis and rheumatism. Wood ash is mixed with vinegar and used locally for serpent bites.

The *Attarin* shops in the Arab Gulf countries sell the powdered leaves of the plant. The women use the paste of this powder in water as shampoo. The infusion of the leaves has been used as cleanser.

Pharmacological Actions and Indications:

The saponin fraction of the leaves has an antimicrobial activity against *Candida albicans*. It also exhibited improvement of glucose utilization in diabetic rats.

References:

Michel, C. G. 1993. A pharmacognostical study of *Ziziphus spina-christi* growing in Egypt. Ph.D. Thesis, Faculty of Pharmacy, University of Cairo.

39. *Zygophyllum coccineum* L.; Sp.Pl.;ed.1,386 (1753)

Arabic :	<i>Rutreyt</i>	ufut
	<i>Kammun kermany</i>	?????
	<i>Ghassoul</i>	¾?Uö
	<i>Balbal</i>	¾
	<i>Tartir</i>	t futu
	<i>Bowal</i>	¾

Morphological Description :

A desert succulent undershrub, up to 75 cm high. Leaflets 2, over 10 mm long, cylindrical, bright green, fleshy carried on a fleshy long petiole. Flowers white. Capsule 5-valved, 8-10 mm long, with obtuse apex (Plate 44).

The leaflets and sometimes the petioles are shed under severe dry conditions to reduce the transpiring surface. Th fleshy cortex of the stem is shed under these conditions for the same reason.

Ecology :

The plant is very common in the limestone wadis of the eastern (Arabian) desert. It dominates a community of widespread occurrence there.

Distribution :

Local : Arid zones of Egypt (Eastern and Western Desert and Sinai Peninsula).

Regional : Syria, Palestine and Sudan.

Status :

The plant is common. Being unpalatable, it is not grazed by animals. It does not give good fuel. So, the plant is neither grazed nor cut for fuel.

Part Used :

Fruits and seeds.

Constituents :

Zygophyllin (28% in leaves, 0.18% in stems and 0.26% in fruits). Quinovic acid (0.36% in leaves, 0.31% in fruits and 0.47% in stems). Flavonoids e.g.; kaempferol-3-rutinoside.

Folk Medicinal Uses:

In the form of infusion as a remedy for rheumatism, gout, cough, asthma, hypertension, flatulent colic and as diuretic.

The juice expressed from the fresh leaves and stems are used as abrasive cleanser and as a remedy for the treatment of certain skin diseases.

Biological Activities:

1. Anthelmintic.
2. Stimulation of toads heart.
3. Stimulation of guinea pig`s intestine.
4. Zygophyllin and quinovic acid exhibited anti-inflammatory activity, cortisone-like action, choleric and antipyretic activities.
5. The aqueous extract produced lowering in blood pressure, diuretic, antipyretic, local anaesthetic and antihistaminic activities.

Economic Potential:

The plant has good reputation in folk medicine. Its marketing depends on collection from the wild.

References:

1. Batanouny, K.H. and Ezzat, Nadia H. 1971. Eco-physiological studies on desert plants. I. Autecology of *Zygophyllum* species growing in Egypt. *Decologia (Berl.)*, **7**: 170-183.
2. Duke, J.A. 1985. CRC Handbook of medicinal herbs. CRC Press Inc. Florida.
3. El-Moghazy, M.A. 1957. A comparative study of the common Egyptian *Zygophyllum* species. Ph.D.Thesis, Faculty of Pharmacy, Cairo University.
4. Elgamal, M.H.A.; Shaker, K.H.; Pollmann, K. and Seifert, K.H. 1995. Triterpenoid saponins from *Zygophyllum* species. *Phytochemistry*. **40**(4): 233-1236.
5. Rizk, A.M and El-Ghazaly, G.A. 1995. Medicinal and Poisonous Plants of Qatar, pp. 229. Scientific and Applied Research Center, University of Qatar.
6. Saad, S.F.; Saber, A.H. and Scott, P.M 1967. *ibid.* 245-251.

7. Saad, S.F.; Saber, A.H. and Scott, P.M.1967. Bull.Fac.Pharm.Cairo Univ.; **6**(1): 253-263.
8. Saber, A.H. and El-Moghazi Shoaib, A.M.1966. J.Pharm.Sci.U.A.R. **7**:117
9. Saber,A.H. and El-Moghazy, M.A.1960. J.Pharm.Sci.U.A.R. **2**.