



## A FIELD GUIDE TO VEGETATION IN DESERT LOCUST BREEDING AREAS



Food and Agriculture Organization of the United Nations  
EMPRES/CR Programme (Desert Locust Component)

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## INTRODUCTION

The Desert Locust, *Schistocerca gregaria* (Forskål), is highly polyphagous and will use almost any plant as food. For locust field officers, a detailed knowledge of all the plants associated with Desert Locust is not necessary; however it is useful to know the main plants which may be used as food or for roosting, basking, moulting or shelter by the insect. This field guide will serve as an introduction to a selection of the many plant taxa utilized by the Desert Locust. The choice of plant taxa for inclusion was made from those taxa reported to be of importance to Desert Locust. Grasses are often difficult to identify even when they are in flower, and in some cases root systems are also required for identification purposes. For this reason, only the most important grasses are included in the field guide. The plants are grouped according to plant habit into trees, shrubs, under-shrubs, herbs and grasses. It is hoped that this grouping will facilitate their recognition. The plants are further verified according to their importance to Desert Locust by asterisks. The plants used only as shelter, roosting or fledging platforms are marked with one asterisk\*; plants used as food are marked with two asterisks\*\*, while highly preferred food plants are marked with three asterisks\*\*\*.

If more detailed identification of plant material is required, then good specimens (preferably with flowers and fruits-and root systems of grasses) must be collected, pressed between sheets of paper (newspaper is often used) and fully labeled (on a separate white sheet in pencil, giving GPS references, locality name whenever possible, date and soil type). In areas where the humidity is high, the papers used in the pressing process must be regularly changed until all the moisture has been removed from the specimens. If the papers are not changed during the pressing process, plant specimens will rapidly develop mould and become useless for identification. Botanists in affected countries' National Herbaria or Universities are often willing to identify plant specimens, provided they are correctly dried and labeled, especially if a duplicate set is made available for their collections.

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**ASCLEPIADACEAE, *Calotropis procera* (Aiton) Dryand. ex W.T. Aiton.:**

Apple of Sodom \*



Young plant, flowers and fruit

#### **GENERAL DESCRIPTION**

A shrub or small tree, of to 2-5m high, typically about 2m high. Stem rounded, simple (rarely branched), pale green and thickly covered with white hairs. The younger parts are obviously white and densely covered in fine very short soft hairs. The bark is yellow-brown, thick and cork-like. The plant is common and widespread, often growing in areas of disturbed land such as roadsides. Sometimes growing in very large pure stands. A white milky sap exudes from any wound on the plant.

#### **LEAVES**

Leaves are opposite, large, fleshy, ovate, up to 30cm long, velvety on the underside.

#### **FLOWERS**

Dense, multi-flowered with clusters of flowers arising from the nodes and appearing as auxiliary or terminal. Flowers white, bordered with dull purple on the upper part and silvery on the lower part.

#### **FRUITS**

A follicle (bladder-like), usually in pairs, large (up to 15cm long), green and with a wrinkled appearance and containing many seeds. Seed are light-brown, broadly ovate, flattened and with silky hairs. When the fruits are mature, they split open to release wind-borne seeds. As the fruit withers it turns brown and shrivels up.

#### **IMPORTANCE FOR DESERT LOCUST**

It is of only little importance as a shelter, roosting and fledging platform. The grasshopper *Poekilocerus hieroglyphus* feeds on this plant and is able to sequester the poisons in the plant to use for its own protection.

#### **ASCLEPIADACEAE, *Leptadenia pyrotechnica* (Forsk.) Decne.:**

Moses Bush \*



A plant from Eritrea



A plant from Sudan

**GENERAL DESCRIPTION**

A leafless green shrub, up to 4m tall with silver coloured bark. It grows as a clump with long whip like branches. The plant may consist of a lot of dead material. It is common on sandy soils and sometimes grows in large almost pure stands (e.g. North Kordofan).

**LEAVES**

No leaves on the older stems, small leaves however develop on the young shoots.

**FLOWERS**

Very small, greenish-yellow with a darker centre. They are fleshy.

**FRUITS**

Follicle, elongated, beaked, seeds tipped with a long tuft of hairs. The seeds are windborne.

**IMPORTANCE FOR DESERT LOCUST**

This plant is of no nutritional importance but used as a roosting and moulting platform.

**BALANITACEAE (Simaroubaceae), *Balanites aegyptiaca* (L.) Delile: Desert Date \***

Part of branch

### GENERAL DESCRIPTION

A tree up to 8-10m high armed with long rigid stout spines. Widespread and common on cracking clay soils and in savanna regions, it often grows in association with *Acacia seyal*, and other *Acacia* spp. The bark is typically grey-dark brown with deep vertical grooves (fissures) with a yellow inner layer (cambium) which may be seen by slashing the bark with a knife. The numerous spines are stout and long (up to 8cm).

### LEAVES

Arranged densely in clusters along older branches, leaflets are paired, and are broadly elliptical (almost oval) in shape and are quite coarse and tough.

### FLOWERS

In auxiliary clusters, very small and insignificant, although the yellow-green stamens are very distinctive. Sepals are densely hairy.

### FRUITS

Large, green ripening to yellow or brown and becoming deeply wrinkled. They have a yellowish sticky but edible flesh.

### IMPORTANCE FOR DESERT LOCUST

It is important as a shelter, roosting and fledging platform. Adults and hoppers will also feed on the leaves.

### CAPPARACEAE (Capparidaceae), *Cadaba* Forssk. : Cadaba Bush \*



Leaves close up

#### GENERAL DESCRIPTION

Shrubs or small trees usually with no spines but branches sometimes end sharply. The four species of *Cadaba* grow as dense much branched shrubs, up to about 2.5m tall. They are often seen without any leaves (deciduous) and they appear to be dead. *C. glandulosa* has obvious glands and stiff straight hairs on the smaller branches (branchlets) as well as on the leaf stalks (petioles). *C. longifolia* is only found on the Red Sea coast while *C. farinosa* grows in dry short grass savanna.

#### LEAVES

Are opposite to one another, *C. glandulosa* and *C. rotundifolia* have rounded leaves. In *C. glandulosa* the leaves are densely glandular and with pointed tips (apex), while in *C. rotundifolia* the glands are lacking, hairless, and are very rough to the touch, much larger, and usually have a slight depression at their tips. In *C. farinosa* the leaves are oblong or elliptic-oblong (rarely ovate), silvery gray and with simple scales.

#### FLOWERS

Whitish green to yellow, develop at the tips of the branches (terminal) on apical racemes. In *C. longifolia* and *C. farinosa* flowers are with four petals, while in *C. rotundifolia* and *C. glandulosa* petals are absent.

#### FRUITS

Almost cylindrical, about 2.5cm long and hang down in pairs in *C. glandulosa*, while in *C. rotundifolia* they are longer at about 4cm. In *C. farinosa*, the seeds are covered in a bright orange membrane while in *C. glandulosa* the membrane is red.

#### IMPORTANCE FOR DESERT LOCUST

This plant is widespread and common, growing near the edges of wadis or khors (seasonal water courses). It is not of importance as a food plant, because of the high salt content of the leaves, but it is very much favoured as a shelter plant and moulting platform

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#### CAPPARACEAE (Capparidaceae), *Capparis decidua* (Forsk.), Edgew. :

Spiny Bush \*



Flower and fruits

#### **GENERAL DESCRIPTION**

A bushy shrub with dense tufts of branches, 4-5m high, or occasionally a small tree with many green vine-like apparently leafless branches hanging in bundles. Bark turns whitish-grey in colour with age, but most old and young branches are a glossy (shining) dark green. The light brown spines arise from swollen bases and occur in pairs on the branches at each node. The plant is widespread and common on sandy and clay soils. It is common in northern Sudan and also on the Red Sea coastal plain in Eritrea. It appears as a dark green very tangled bushy shrub. Due to the presence of so many small sharp spines, the bush is quite impenetrable.

#### **LEAVES**

Usually is leafless. Leaves on young shoots are very small about 2mm long, on a short stalk (petiole), leaves are never produced at the same time as the flowers and have a very short life.

#### **FLOWERS**

Pink on long stalks (pedicels), red-veined, in small groups along the leafless shoots. They arise from the axils of the spines.

#### **FRUITS**

Rounded, about the size of a small grape, pink becoming blackish when dry and edible. Fruit is many seeded and ovoid.

#### **IMPORTANCE FOR DESERT LOCUST**

It is important as a roosting, moulting and shelter plant.

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#### **CAPPARACEAE (CAPPARIDACEAE), *Maerua crassifolia* Forsk. :**

Desert Maerua \*



Twig and leaves

#### **GENERAL DESCRIPTION**

A small tree, much branched, up to 10m tall, mostly 3-5m. The young twigs are densely hairy. The tree is widespread and common on sandy soils. It has tough and very twisted pale grey branches and smooth bark. It is very distinctive as it is often the only tree growing in some truly desert areas. It is common in Northern Sudan in the very dry areas.

#### **LEAVES**

Arranged in dense clusters along older branch-lets, also they occur singly on the younger twigs, leaves very small, with a broad base and elliptical shape, 3-5cm long. They are somewhat fleshy and are covered in small dense hairs (pubescent). They have a very short stalk (petiole).

#### **FLOWERS**

Usually 2-4, axillary, with no petals, green sepals, long anthers, with many stamens. Sweetly scented.

#### **FRUITS**

Cylindrical up to 8cm long, markedly constricted into globose segments and each may contain up to 10 seeds.

#### **IMPORTANCE FOR DESERT LOCUST**

It is important as a roosting, moulting and shelter plant, particularly as it may provide the only available shade in some of the desert localities.

**CHENOPODIACEAE, *Suaeda monoica* Forssk. ex Gmel. , *S. fruticosa* Forssk. :**

Salt Bush \*



Single bush



#### **GENERAL DESCRIPTION**

The plants are much branched, growing as dense bushy shrubs in salt marches and deserts, *S. fruticosa* is restricted to coastal habitat, *S. monoica* is restricted dry desert habitats. The shrubs are up to 2-4m tall, mostly 2m. They are unmistakable, and are commonly seen growing in the area along the Red Sea coast of Eritrea and Sudan.

#### **LEAVES**

Alternate, fleshy and hairless. In *S. monoica* leaves are up to 2.5cm long, in *S. fruticosa* leaves 6-8cm long, cylindrical, linear and rather thick.

#### **FLOWERS**

*S. monoica* produces flowers all year round, as terminal panicles on drooping branches. The flowers are very small and insignificant. *S. fruticosa* flowers are auxiliary in clusters forming long leafy loose spikes.

#### **FRUITS**

Fruit perianth red and becomes black when dry in *S. monoica*. In *S. fruticosa* fruits are small and are glossy black.

#### **IMPORTANCE FOR DESERT LOCUST**

Used for roosting and more specifically during fledging, and as a shade habitat.

#### **FABACEAE (Mimosoideae), *Acacia* Mill.:**

*Acacia* \*



*Acacia tortilis*

### GENERAL DESCRIPTION

Spiny shrubs or trees, very variable in height, shape and habitat from low bushes of 2-3m to 30m tall trees and may be single or multi-stemmed. The majority prefer sandy habitats. Locust officers do not need to know many species, as they are difficult to identify, however the commonly seen species are: *A. tortilis*, *A. nilotica*, *A. senegal* (gum Arabic tree), *A. mellifera* and *A. ehrenbergiana*. *A. tortilis* is a medium umbrella-shaped tree 4–15m tall, often with several trunks, reduced to a small wiry shrub less than 1m tall when growing under extremely arid conditions. Two types of thorns one long, straight and white, and the other small, hooked and brownish.

### LEAVES

Compound bi-pinnate in general (with two leaflets) and with leaflets arranged in pairs. *A. mellifera* leaves with only 2 leaflets, *A. tortilis* 4–10 pairs of pinnae, each with about 15 pairs of small leaflets.

### FLOWERS

Small and regular in shape with many stamens. Also very variable, but often rounded on heads i.e. *A. nilotica*, *A. tortilis*, *A. ehrenbergiana* or on spikes i.e. *A. mellifera*, *A. senegal*, yellow or white, usually sweet smelling. *A. tortilis* flowers are white, aromatic, in small clusters.

### FRUITS

Pods occur in a wide variety of shapes and sizes. In the desert species they are long or twisted, or sometimes flattened. *A. nilotica* pods are constricted between seeds. *A. tortilis* pods are flat and coiled into a spring-like shape.

### IMPORTANCE FOR DESERT LOCUST

Used as roosting and moulting platforms, they may also feed on leaves, especially *Anacridium* spp. (a pest on *A. seyal*).

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### FABACEAE (Mimosaceae), *Prosopis juliflora* (Sw.) DC.:

Mesquite \*



inflorescence (flowers)

**GENERAL DESCRIPTION**

A spiny shrub or a small tree, up to 10m tall, usually much shorter 3-4m. This tree is widespread and common on sandy soils, especially the Red Sea coast, where it is often the only species present forming dense impenetrable thickets. It has a grooved brown bark and long hanging branches. It was introduced to combat desertification and is now a very widespread invasive weed.

**LEAVES**

Bi-pinnate, variable, 3-10cm long, with opposite pairs of smaller pinnae, each bearing between 12-60 pairs of small leaflets with sharp, paired yellow coloured spines at the base of the leaf.

**FLOWERS**

Greenish white turning to yellow on cylindrical 7-15cm long racemes.

**FRUITS**

Straight or sometimes slightly curved pods with a very small pointed beak at the tip.

**IMPORTANCE FOR DESERT LOCUST**

It is important as a roosting and fledging platform. Adults, when hungry will also feed on the leave as has been observed in Mauritania and in Sudan, although it is not a food plant of choice.

**FABACEAE (Caesalpinaceae); *Tamarindus indica* L.:**

Tamarind Tree \*



**GENERAL DESCRIPTION**

A large tree with a stout trunk and compact rounded crown and drooping branches, up to 20m tall. The bark is pale grey and fissured. The bark will show a pale red slash if cut with a knife. This tree is widespread in Central Sudan particularly near Wadis, valleys or "khors".

**LEAVES**

Opposite, pinnate, up to 15cm long and bearing leaflets of 10-15 pairs. They are unequally rounded at the base, and have a small depression at their tips.

**FLOWERS**

Terminal at the tip of the branches, yellow, streaked with red or orange, sepals are red on the outside and yellow inside. They hang down on slender stalks.

**FRUITS**

The pods 10-17cm long, pale brown with a brittle wavy outer shell containing a sticky pulp through which fibers pass joining the seeds together. Seeds 1-10, very dark purple with a shining appearance.

**IMPORTANCE FOR DESERT LOCUST**

It is not very important for Desert Locust; however swarms may settle on the trees and roost on the trunk.

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**RHAMNACEAE, *Ziziphus spina-christi* (L.) Desf. *Z. mucronata* Wild. :**

Christ thorn \*



Part of branch

#### GENERAL DESCRIPTION

There are two common widespread species, which are very similar. Trees up to 15m tall, most often much shorter. Bark pale grey, branch-lets pale or nearly white. This plant is widespread and common on sandy soils in Savanna regions. It is armed with spines on the noticeably zigzag branches. In *Z. spina-christi* there is usually one straight spine, and the other one is slightly re-curved, while in *Z. mucronata*, one spine is more sharply re-curved, and the other is quite stout (thick). The wood is light pink in colour.

#### LEAVES

Thin, rather a pale green, ovate, leaf base with equal sides in *Z. spina-christi*, whereas in *Z. mucronata*, they are unequal (oblique) with a mucronate (ending in a sharp point) tip and. When looked at carefully there may be a very fine covering of minute hairs on the underside of the leaves (especially in *Z. mucronata*).

#### FLOWERS

Very small and insignificant, in dense groups (racemes) and greenish yellow.

#### FRUITS

Pale green darkening to a deep reddish brown rather acrid and scarcely edible in *Z. mucronata*, whereas they are more fleshy and edible in *Z. spina-christi*.

#### IMPORTANCE FOR DESERT LOCUST

It is important as a shelter, roosting and fledging platform.

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#### SALVADORACEAE, *Salvadora persica* L.:

Toothbrush Tree \*



Flowers and leaves enlarged



#### **GENERAL DESCRIPTION**

A much-branched shrub or tree, younger branches are rounded when cut in cross section. It often appears as a straggly tree, and may have a huge crown, the branches trail on the ground, especially when it grows in or on the edge of Wadis. It remains green all the year round. Heavily browsed trees often grow as low mounds on the Sudan coastal plains where the sand will build up around them. It grows typically along the edges of Wadis, may also grow inland (as on the Eritrean coastal plain).

#### **LEAVES**

Oblong, about 5-7cm long, pale green and leathery.

#### **FLOWERS**

Greenish white and produced in large numbers on panicles from the branch tips (terminal). They have a strong rather a musty odour.

#### **FRUITS**

Almost rounded (sub-globose), size of pea, succulent, with a hard seed and purple colour when fresh.

#### **IMPORTANCE FOR DESERT LOCUST**

This plant is of limited nutritional importance. It is favoured as a roosting and moulting platform, and its leaves are eaten during dry periods.

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#### **Part two: Under shrubs and herbs**

**AMARANTHACEAE, *Aerva javanica*** (Burm. f.) Juss. ex Schult.:

Pillow plant \*\*



Flower Spikes

**GENERAL DESCRIPTION**

White-wooly (like white hair) under shrub that grows as a clump, up to about 1m high. It is often widespread in dry areas (arid), but patchy in its distribution. The stems are covered with dense star minute shaped white hairs, giving the plant a very silvery appearance against the background of its darker green leaves, with silvery undersides. This plant is widespread and common on sandy soils. There are other species in this genus, but they are very similar.

**LEAVES**

Alternate, very variable in shape and are spear-shaped (lanceolate) or sometimes almost linear. They may be up to 7cm long.

**FLOWERS**

White on a terminal dense leafless cylindrical spikes. They are fluffy.

**FRUITS**

Small and insignificant one seeded, and are dispersed by the wind.

**IMPORTANCE FOR DESERT LOCUST**

It is important as a food, shelter and fledging platform.

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**BORAGINACEAE, *Heliotropium* L.:**

Desert Heliotrope \*\*\*



Flowers, enlarged

### GENERAL DESCRIPTION

Herbs or under shrubs, growing flat on the ground (prostrate) or upright, up to about 60cm tall. Some species are prostrate (grow flat on the ground) e.g. *H. supinum* L., others e.g. *H. ovalifolium* grow erect (upright). The stems may be heavily covered with short fine white hairs giving the plant a furry appearance. *H. arbainense* is an erect greenish white perennial herb while *H. bacciferum* is a sub-erect hairy greenish-grey herb with rough stiff branches and grey bristles.

### LEAVES

Lack stalks (sessile) in *H. lignosum*. The upper surface is coarsely rough and grooved in *H. indicum*. They may be elliptical with a long petiole as in *H. supinum* or elliptical- lanceolate as in *H. ovalifolium*. Both surfaces may be covered with hairs as in *H. aegyptiacum*, or leaves may be small as in *H. sudanicum*. The leaves are also variable in colour e.g. *H. aegyptiacum* leaves are quite dark green.

### FLOWERS

Yellow or white, small and in spikes, the spikes are usually bent backwards near their tips giving the inflorescence the scorpion-like appearance. In some species the flowers are dense (e.g. *H. sudanicum*, *H. ovalifolium*) or only a few (e.g. *H. supinum*).

### FRUITS

Small nutlets and may be spiny or bare.

### IMPORTANCE FOR DESERT LOCUST

The plants are a favorite food for Desert Locust. The favourite habitat for Desert Locust is where the plants grow on sandy soil in association with *Panicum sp.* This plant is also used for shelter and basking.

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### CAPPARACEAE (Capparidaceae), *Dipterygium glaucum* Decne.:

Desert Clump Flower \*



Single plant



Flowers

**GENERAL DESCRIPTION**

A flat spreading under-shrub with numerous straight rigid branches, which develop into woody stems as the plant grows older. When it is dry, the plant looks dead, and there is often a great deal of dead plant material and shed seeds on the ground underneath it. It grows extensively along the Red Sea coastal plain, and also in the drier parts of the Sudan. This plant often grows over a wide area and is commonly found among stands of *Panicum sp.*

**LEAVES**

Small, oval to oblong and up to about 1cm long. They may be either smooth (glabrous) or even rough (scabrous). When held up to the light, glands can be seen in the leaves.

**FLOWERS**

Small and bright yellow, on short stalks (pedicels) and all on long lax terminal racemes.

**FRUITS**

Nutlike, elliptical and are surrounded by a membranous strongly veined wing. They are often seen littering the ground beneath the plant.

**IMPORTANCE FOR DESERT LOCUST**

This plant is very attractive to Desert Locust and is a favourite shelter plant.

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**CHENOPODIACEAE, *Salsola vermiculata* L. (= *S. forsskalei*):**

Mediterranean saltwort \*



**GENERAL DESCRIPTION**

A perennial under-shrub, up to about 1m tall, ascending to erect, woody at the base, much branched with alternate branches.

**LEAVES**

Leaves minute, scale-like, crowded in distinct small knot-like branches on thin yellow glossy stems. Foliage typically covered with minute hairs, but sometimes becoming glabrous (smooth) at maturity. Leaves alternate, 3-9mm long, oblong to ovate, with rounded tips. Often there are several reduced leaves about 1-4mm long in the axils.

**Flowers**

Solitary (rarely 2 or 3), borne in leaf axils at stem tips. Petals lacking, sepals often pinkish and sparsely covered with minute hairs especially at the apex, with fan-shaped wings approximately 2mm long.

**Fruits**

Fruiting structures greenish to grey, surrounded by persistent sepals, 7-12mm in diameter (including sepal wings), 1-seeded, with remnants of the style at the apex. Seed more or less round, slightly flattened, with a transparent membranous seed coat.

**IMPORTANCE FOR DESERT LOCUST**

Used as a shelter plant

**CLEOMACEAE (Capparidaceae), *Cleome gynandra* L. Cleome\***

**GENERAL DESCRIPTION**

There are a number of species in the genus, although it is not necessary to recognize the species. *C. gynandra* is an erect upright herb, which is very distinctive. The stem is covered with glandular hairs.

**LEAVES**

Alternate, compound, in open groups of five (five foliate), with long petioles, which are also hairy.

**FLOWERS**

On dense terminal racemes and rather glandular in appearance. The petals are violet or sometimes even whitish in colour.

**FRUITS**

Long spiny capsule.

**IMPORTANCE FOR DESERT LOCUST**

This plant is of minimal nutritional importance; however adults and hoppers may eat the seeds.

**SYNONYM**

*Gynandropsis gynandra* (L.) Briq.

**COMPOSITAE, *Launaea capitata* (Spreng.) Dandy:**

Coastal Dandelion \*\*\*



**GENERAL DESCRIPTION**

A hairless (glabrous) biennial (flowering every second year) herb, up to 50cm high. It has a bare stem. It is found only on the Red Sea coast as far north as Egypt.

**LEAVES**

Long and lyrate (with large terminal lobe and smaller lower lobes), with small but distinct lobes along their outer edges. The basal leaves form a tight rosette, giving the plant quite a dense centre when seen from above.

**FLOWERS**

Flowering head is yellow, the terminal flowers clustered, and lateral flowers usually solitary.

**FRUITS**

Seeds are yellow, small and winged, and are dispersed by the wind.

**IMPORTANCE FOR DESERT LOCUST**

An excellent food plant. Hoppers and adults thrive when feeding on this plant. It has a localized distribution and does not provide the locusts with lasting benefits (i.e. benefits are only immediate prolonged feeding on the plant does not enhance fecundity).

**SYNONYM**

*L. glomerata* (Cass.) Hook.f.

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**CRUCIFERAE, *Farsetia longisiliqua* Decne. Farsetia\*\***

Fruit

**GENERAL DESCRIPTION**

An annual, erect, woody and silvery white under-shrub, up to 50cm tall. The stem is covered with white hairs.

**LEAVES**

Alternate, narrowly linear, acute at the apex and hairy on both surfaces.

**FLOWERS**

Occur in auxiliary or terminal racemes. They are white to pale orange, with four petals.

**FRUITS**

Long and narrow pods. Pods open parallel to the flat side. Seeds flat, oval, brown with membranous margins.

**IMPORTANCE FOR DESERT LOCUST**

A good source of food as early Desert Locust maturation was observed on the females fed on *F. longisiliqua*.

**CRUCIFERAE, *Schouwia thebaica* Webb. (= *S. schimperi* Jaub. & Spach.):**

Crack Bush \*



Young flower



Individual clump



#### GENERAL DESCRIPTION

A woody, hairless herb or under-shrub which branches out from its base, up to 1m in height. When the old plant dies, it turns yellow and may remain for years before disintegrating completely. This plant is not really a typical desert annual, as it is very much restricted to sites that can provide enough water for growth to take place. It is often found in small wadis/khors where there might have been temporary ponds. The plant is not common in the red sea coast of Sudan, but is widely distributed in the Eritrea Red Sea coast.

#### LEAVES

Sessile (with no stalk), thick, tough, more than three times as long as broad, lanceolate with a deep groove at their base through which the stem passes.

#### FLOWERS

Bright purple with four petals.

#### FRUITS

Compressed, with lateral wings and has a pointed tip. It has a papery almost translucent appearance.

#### IMPORTANCE FOR DESERT LOCUST

This plant is used for shade; and even the very small plants are able to provide shade due to their large leaves. Locusts and other grasshoppers (e.g. *Diablocatantops*, *Locusta*) often use the old dead plants as shelter from the sun.

**CUCURBITACEAE, *Citrullus colocynthis* (L.) Schrad., *C. lanatus* (Thunb.) Matsum & Nakai.:**  
Wild Melon \*

Flower, fruit and leaf



#### **GENERAL DESCRIPTION**

A low growing, prostrate annual herb, which sprawls (spreads out) extensively across the ground. Stems are angular and rough. This plant is widespread and common on sandy soils. There are two species: *C. colocynthis* which is common in Northern Sudan while *C. lanatus* is widespread cultivated by man as Water Melon. The stem is rough

#### **LEAVES**

The leaves are rough to touch, and are thick. In *C. lanatus* leaves are deeply divided, while in *C. colocynthis* they are not as deeply divided, and are paler yellow in colour.

#### **FLOWERS**

Solitary, auxiliary and greenish yellow.

#### **FRUITS**

Rounded, green and yellow variegated becoming yellow when ripe, with a hard skin intensely bitter. About the size of a small orange in *C. colocynthis*, while in *C. lanatus* it is about the size of a man's head, or larger in cultivated varieties and sweet. Seeds are numerous

#### **IMPORTANCE FOR DESERT LOCUST**

It is important as a shelter and basking plant, and the damaged fruits may also be eaten.

#### **SYNONYMS**

*Citrullus colocynthis* (L.) Schrad. = *Colocynthis vulgaris* Schrad.

*Citrullus lanatus* (Thunb.) Matsum & Nakai = *Colocynthis citrullus* (L.) Kuntze

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**CYPERACEAE, *Cyperus conglomeratus* Rottb. (= *C. pungeens* Boeck.):**

Sedge \*\*



**GENERAL DESCRIPTION**

The plant is tufted pale green, with densely matted wooly root fibers, stems compressed and leafy at the base and 15 to 61cm high. The other common species is *Cyperus laevigatus*.

**LEAVES**

Cylindrical, grooved and have pungent smell when crushed.

**FLOWERS**

In a dense head, spikelets pale, 6 or more. Head pale brown.

**FRUITS**

A small nut.

**IMPORTANCE FOR DESERT LOCUST**

Used as shelter, food source and locust will often lay eggs near them as the plants provide a good micro climate.

**EUPHORBIACEAE, *Chrozophora oblongifolia* (Del.) A. Juss. ex Spreng.:**

White Forb \*\*



Leaves and flowers

#### GENERAL DESCRIPTION

There are two species *C. oblongifolia* and *C. plicata* that occur in the Desert Locust habitat. *C. oblongifolia* is a much branched under shrub while *C. plicata* is a prostrate under shrub. Both species are covered with dense white star-shaped hairs, giving the plant a very pale appearance. *C. oblongifolia* is commonly seen as a clump, as in this example from Northern Kordofan.

#### LEAVES

In *C. plicata* leaves have petioles and are ovate, while in *C. oblongifolia* leaves are ovate to oblong or even lanceolate. They are covered with white hairs and alternate.

#### FLOWERS

Yellow in *C. oblongifolia* or pink in *C. plicata* and are formed in the leaf axils.

#### FRUITS

Inconspicuous, three-lobed and produced in capsules, red purple and hairy in *C. plicata* or blue purple in *C. oblongifolia*.

#### IMPORTANCE FOR DESERT LOCUST

It may have some use as a food plant, although Euphorbiaceae are not usually favoured as a food source.

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#### FABACEAE (Papilionaceae), *Crotalaria* (L.):

Crotalaire, Rattlepod \*\*

Flowers



Seed pods



**GENERAL DESCRIPTION**

There are at least 43 species and a number of subspecies known in the Sudan. It is not necessary to be able to identify individual species. They grow as an erect herb up to about 2.5m. The young parts of the plant often have a silky appearance. The most common species occurring in the summer breeding area are *C. microphylla*, *C. thebaica* and *C. saltania*.

**LEAVES**

They are three leaflets; the leaf stalk is very short to no stalk in *C. thebaica*, leaves oblong to lanceolate.

**FLOWERS**

Inflorescence is terminal or lateral raceme and rather glandular in appearance. Grouped in pairs, and are usually yellow or yellow tinged with mauve or red on the keel petals (the inferior petals).

**FRUITS**

The pod is about 2-3cm, and is hairy. In the common species *C. mucronata* with 20-30 seeds in a pod.

**IMPORTANCE FOR DESERT LOCUST**

These plants are a food source for all stages.

**FABACEAE (Papilionaceae), *Indigofera* L.:**

Wild Indigo \*\*



#### **GENERAL DESCRIPTION**

There are more than 58 species known in Sudan, and it is not necessary to recognize individual species. It grows as a diffusely branched herb, usually recognizable by the silver coloured branches. They are usually less than 1.5m high, other common species are *I. diphylla*, *I. sessiliflora* and *I. hochstetteri*.

#### **LEAVES**

Usually with three leaflets and the lower surface is typically very silvery.

#### **FLOWERS**

Pink or yellow, but may occur in other colours such as purple or red. They are formed on long racemes and can number as many as 30 flowers. This family has characteristically shaped flowers.

#### **FRUITS**

The pod is straight and about 2-3cm long and it has a mucronate tip (ending in a small sharp point).

#### **IMPORTANCE FOR DESERT LOCUST**

These plants are a food source for all stages.

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**FABACEAE** (Papilionaceae), *Tephrosia nubica* ( Boiss.) Baker, *T. apollinea* (Del.)DC. :  
Tephrosia \*\*



#### **GENERAL DESCRIPTION**

Bushy under shrubs, up to about 50cm tall, very diffusely branched from the base. There are a number of species, and it is not necessary to know the differences. This plant is very widespread, and often forms thick clumps, excluding all other vegetation. Other species also occur.

#### **LEAVES**

Pinnate, *T. nubica* leaves 3-4 paired leaflets and oblanceolate. The leaflets are variably hairy on both surfaces.

#### **FLOWERS**

Purple or pink (*T. nubica*), red (*T. apollinea*, *T. pentaphylla*) or white to slightly pink (*T. uniflora*), in lax (drooping) spikes of 6-20 (*T. nubica*), or 6-16 (*T. apollinea*).

#### **FRUITS**

Straight pods, 1-2cm long or longer (4-4.5cm) as in *T. apollinea*.

#### **IMPORTANCE FOR DESERT LOCUST**

It is important as a food plant, and both the adults and hoppers will feed on the leaves. Where thick clumps develop, locusts will use them for shelter and shade.

**GISEKIACEAE**, (Molluginaceae, Aizoaceae) , *Gisekia pharnacioides* L.:\*\*



**GENERAL DESCRIPTION**

An annual, variable plant, prostrate, sometimes tinged with pink. All parts are streaked with linear white raphides (small crystals). Stems up to 60cm long.

**LEAVES**

Opposite, with leaf shape variable, linear, elliptic or lanceolate, apex obtuse or acute. Both surfaces with many noticeable white raphides (small crystals).

**FLOWERS**

Very small, in auxiliary cymes, pinkish white, 5-20.

**FRUITS**

With free 5 carpels, mostly spiny, sometimes smooth, surrounded by persistent sepals. Seeds black, smooth, minutely pitted.

**IMPORTANCE FOR DESERT LOCUST**

These plants are a food source, and often support solitary individuals to the rough fledging.

**MALVACEAE, *Pavonia kotschy* Hochst. ex Web: Povania\*\***



Flowers

**GENERAL DESCRIPTION:**

A low woody perennial herb with short very densely hairy branches. There are a number of species, but it is not necessary to know the individual species.

**LEAVES:**

Elliptic orbicular with deep teeth near the tips. They are broad at the base. They are hairy on their under surfaces, with mixed long and short hairs.

**FLOWERS:**

Solitary, small and yellow and arise from leaf joints (axils) on long stalks. Each appears to be enclosed in a star-shaped fragile basket.

**FRUITS:**

They develop within a "basket-shaped" structure, and are covered in fine hairs.

**IMPORTANCE FOR DESERT LOCUST:**

This plant is a food source to all stages.

**NYCTAGINACEAE: *B. repens* L. var. *diffusa* (L.) Boiss) , *Boerhavia erecta* L. :**

Tar vine \*\*



**GENERAL DESCRIPTION**

A flat growing (prostrate) herb, it sometime grows upwards from the main low growing mat. The stems are smooth often reddish brown on the upper side and the nodes are hairy (ciliate). A related species, *B. erecta* is an upright plant of similar habit and grows near the Red Sea coast up to about 75cm. The plant is widespread and common on sandy soils.

**LEAVES**

Opposite, broadly ovate, margins undulate, smooth (glabrous), in pairs and of unequal size, they have only a very short stalk. In *B. erecta* the leaves have a wavy margin (outline), and a pale green, somewhat with dull appearance while the undersurface is whitish.

**FLOWERS**

Small and rather tubular in shape, usually various shades of pale pink and grouped together on long stalks. The flowers of *B. erecta* are small and pinkish white.

**FRUITS**

Small oblong capsules which do not break open.

**IMPORTANCE FOR DESERT LOCUST**

Both species are utilized as food plants.

**SOLANACEAE, *Datura stramonium* L. , *D. innoxia* Mill.:**

Thornapple \*



Individual flower

#### **GENERAL DESCRIPTION**

An erect, annual herb or under shrub up to about 1m high. The stem is only hairy on the younger parts more which are more or less angular in *D. stramonium* while *D. innoxia* the stem is densely hairy. It is often associated with disturbed ground. There are two other species in the genus, but they are very similar, differing in the size of the flowers, and shape of their leaves.

#### **LEAVES**

Alternate, in *D. innoxia* leaves are broadly ovate, leaf base unequally rounded (oblique) while *D. stramonium* leaves are sharply incised (toothed). They have an unpleasant smell when they are crushed.

#### **FLOWERS**

Occur singly, large (longer than 10cm) and white often with violet spots on them. They arise from the axils of branches.

#### **FRUIT**

Hard, spiny capsule of about 5cm, which varies in colour depending upon the species. The seeds are black.

#### **IMPORTANCE FOR DESERT LOCUST**

The plants are widespread and common on sandy soils. It is important as a shelter and fledging platform.

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#### **TILIACEAE, *Corchorus depressus* (L.) Christens:\***



Leaves and pods

**GENERAL DESCRIPTION**

A flat growing (prostrate), spreading rather woody perennial herb which has a distinct strong tap root. Tap root is about 10cm long. The stem is pale, and branches are alternate. It is widespread especially in sandy areas, where it grows in patches.

**LEAVES**

5-1.5cm) with a wavy margin (outline). When seen with a hand lens, the leaf petiole (stalk) is hairy on the young leaves, but this is not so on the older leaves. The mid-vein is clearly visible and other leaf veins appear to be slightly sunk into the leaf surface.

**FLOWERS**

Small yellow and are either single or in pairs and auxiliary.

**FRUITS**

Small, a capsule, about 1.5cm long, split into four valves when they are ripe they release the small blackish seeds.

**IMPORTANCE FOR DESERT LOCUST**

It is not a preferred food plant; however it may be used for basking, to keep the insects clear of the hot soil surface.

**SYNONYMS**

*C.antichorus* (L.) Raeusch, *Antichorus depressus* L., *Jussiaea edulis* Forsk.

**SOLANACEAE, *Solanum incanum* L.:**

Potato bush \*



Single flower

**GENERAL DESCRIPTION**

*Solanum* spp. are under-shrubs or herbs, up to 2m tall, stout and widespread. The stem is heavily armed with spines in *S. dubium* and *S. incanum*, while *S. nigrum* is not spiny.

**LEAVES**

Are alternate and ovate. In *S. dubium* leaves are dark green on the upper side, pale green beneath with sharp spines along the lower midrib. In some species e.g. *S. incanum*, and *S. nigrum* the leaves are entire (leaf margin not toothed or divided), while in *S. sodomium*, the leaves are long, thin and much divided.

**FLOWERS**

Occur singly, are violet and arise from the leaf joints (axils) and white in *S. nigrum*. The outer surrounds of the flowers (calyx) are also spiny. In other species the flowers are white and may have a yellow centre (*S. sodomium*).

**FRUITS**

Appear as smooth (glabrous) yellow berries, which are dry and hard when ripe in *S. dubium*, black in *S. nigrum*.

**IMPORTANCE FOR DESERT LOCUST**

They are important as a shelter and fledging platforms, as the spines may offer some protection against predators.

**PORTULACACEAE: *Portulaca oleracea* L.**

Purslane \*



**GENERAL DESCRIPTION**

An annual, flat growing (prostrate) very fleshy herb. Stem often reddish brown. It grows in large mats often covering the ground and excluding all other plant growth.

**LEAVES**

Alternate, fleshy, smooth, simple shiny green and sometimes purple, scattered along the stem, tending to be crowded beneath where the flowers arise.

**FLOWERS**

Small and bright yellow, solitary or few flowered usually formed at the tips of the branches (terminal) on the leaf axils (auxiliary). They only open for a short time in the mornings.

**FRUITS**

Small rounded capsules that contain many very tiny black seeds.

**IMPORTANCE FOR DESERT LOCUST**

Although this plant is not recognized as a food plant, hoppers may use it for basking when the ground surface becomes too hot.

**ZYGOPHYLLACEAE, *Fagonia cretica* L.:**

Spiny Fagonia \*



Flower

**GENERAL DESCRIPTION**

A prostrate (spreading), much branched, dark green, spiny but woody herb. It grows in moist habitats in desert areas where it is widespread.

**LEAVES**

Opposite to one another and are very variable in shape. They are obviously pointed (acute) at their tips that are toughened (with callous). The spines beneath the leaves (stipules) are long. They may even be longer than the leaves.

**FLOWERS**

Rose or lilac coloured and of single and are sweet smelling. They arise from the joint of the stem and leaf (axils). The petals are much longer than the sepals..

**FRUITS**

Hang down and are suspended on a stalk. They are about 1cm long.

**IMPORTANCE FOR DESERT LOCUST**

This plant is of limited nutritional importance; however it is favoured as a roosting and moulting platform and it will provide food during dry spells. The spiny nature of the plant may also help to protect hoppers and fledglings from predators during moulting.

**ZYGOPHYLLACEAE, *Tribulus terrestris* L., *T. longipetalus* Viv., *T. pentandrus* Forsk.:**

Sore Foot Plant, Puncture Vine \*\*



### GENERAL DESCRIPTION

This plant is widespread and common on sandy soils, where it is a rapid colonizer of waste ground. They are either flat spreading or upright herbs, develops a woody stem and older branches are sometimes swollen. The stem is jointed, and in *T. longipetalus* the stem is densely hairy. Other very similar species are found in northern Sudan.

### LEAVES

Pinnate, opposite and of unequal size. There are obvious small spines (stipules) at the base of the leaves. In *T. longipetalus*, the leaves are densely covered with hairs.

### FLOWERS

Small and bright yellow, which occur singly in the axils of leaves throughout the plant. *T. pentandrous*, which occurs on the Red Sea coast may be distinguished by only having 5 stamens (when compared to 10 in *T. terrestris*).

### FRUITS

Characterized by two rigid and divergent spines on them (painful to walk on!). In *T. longipetalus* the fruits are also densely hairy and winged. The different species within this genus can only be reliably separated when fruits are available.

### IMPORTANCE FOR DESERT LOCUST

It is important as a food plant, and for basking.

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### ZYGOPHYLLACEAE, *Zygophyllum album* L. f. and *Z. simplex* L.:

Yellow Simplex \*



Flowers, close up



individual plant



#### **GENERAL DESCRIPTION**

A much branched, flat-growing (prostrate), succulent, very lightly hairy herb. It often forms small clumps, mats or patches which may extend over wide areas e.g. Eritrea Red Sea coast (main photo above). *Z. album* is common on the coastal plains, while *Z. simplex* is more abundant inland. The other two species are difficult to tell apart, without expert advice.

#### **LEAVES**

Opposite, unequal in size, and are simple, narrow (cylindrical), shiny and fleshy. In *Z. album*, there are two leaflets (bi-foliate) that are covered in hairs, so fine they can not be seen with the naked eye (hand lens needed). In *Z. simplex*, the leaves are single (unifoliate) and hairless.

#### **FLOWERS**

Insignificant, yellow, and produced on very short stalks. They are often quite dense giving the plant a yellowish appearance when seen from a distance. They are the same colour in both common species.

#### **FRUITS**

Capsule, very small, with 5 lobes that are similar in both species.

#### **IMPORTANCE FOR DESERT LOCUST**

This is not a food plant; however it is often used as a roosting or moulting platform, or to keep the hoppers clear of the (usually sandy) ground when it does become very hot.

#### **POACEAE (Gramineae), *Aristida adscensionis* (L.)**

Common Needle grass \*\*



**GENERAL DESCRIPTION**

An annual grass which is often seen growing in distinct feathery clumps, up to 90cm tall. It prefers growing on sandy soils, although it is tolerant of other soil types and it is a colonizing species on disturbed land. As with many other grasses, it is difficult to identify to species level and taxonomic characters are found mainly on the flower sheaths (glumes).

**LEAVES**

Long, narrow with a fine pointed tip purple at the base.

**FLOWERS**

Insignificant, as little purple patches on a long straw coloured cylindrical spike.

**FRUITS**

The seed heads are often purple, and minute seeds are wind borne.

**IMPORTANCE FOR DESERT LOCUST**

This plant is recorded as a food plant, and like other grasses, it will be eaten by all stages.

**SYNONYM**

*A. submucronatus* Schum.

**POACEAE** (Gramineae), *Cynodon dactylon* (L.) Pers. :

Bermuda grass \*\*



#### **GENERAL DESCRIPTION**

A creeping, rhizomatous perennial grass with underground rhizomes and on the ground runners which often form a low dense mat. The runners spread horizontally and bear nodes with internodes of about 10cm length. The runners may be flattened or cylindrical. New plants sprout from where these runners touch the ground. It is very widespread, and often grows around the base of termite mounds. The grazed leaves produce high quantities of cyanogenic glucosides, as a grazing response.

#### **LEAVES**

Show an alternate-distal pattern of distribution along the runners. Leaf blades are open up to the base; green to dull-green, from 1 to 15cm and are linear to lanceolate in shape.

#### **FLOWERS**

Insignificant, but they occur on star-shaped racemes radiating outwards, which are narrow and in groups of 3-7, rarely 2.

#### **FRUITS**

Sub-elliptical, compressed and brownish coloured.

#### **IMPORTANCE FOR DESERT LOCUST**

This plant is very attractive as a food plant, and like other grasses it will be eaten.

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#### **POACEAE (Gramineae), *Cenchrus ciliaris* L.:**

African foxtailgrass \*\*



Flower head – close up

**GENERAL DESCRIPTION**

A perennial, stout, tough branched grass. May occur in pure stands in the summer breeding areas.

**LEAVES**

Linear, long, pointed and hairless. The old dead leaves often remain on the plant.

**FLOWERS**

Insignificant as little purple patches on a long straw coloured (pale yellow) cylindrical flower heads which bend in the wind.

**FRUITS**

The minute seeds are wind borne.

**IMPORTANCE FOR DESERT LOCUST**

This plant is recorded as a food plant, and like other grasses it will be eaten by all stages.

**SYNONYMS**

*Pennisetum cenchroides*, *P. ciliare*.

**POACEAE** (Gramineae), *Panicum turgidum* Forsk.:

Plains Clump Grass \*\*

Single plant



**GENERAL DESCRIPTION:**

A shrub-like perennial grass, which can grow in dense clumps up to 1m in height. Culms (stems) erect, woody and solid. It is sometimes the dominant vegetation type for very large areas where it forms a particular vegetation type (e.g. Red Sea coast of Sudan and Eritrea). The entire plant is a pale greenish-blue, often covered with a fine bloom. During the dry season it appears completely dry, but will begin greening up soon after rainfall. This grass tends to grow as a dominant species where it is found. The roots are remarkable in having such a fine root mesh that sand grains cling to them giving them a corky appearance. This grass has remarkable drought tolerance. It prefers to grow in deep sand. The stems are tough and hard.

**LEAVES:**

Few and typically grass-like, variable in size, however the leaf-sheaths are firm and may even be leathery. The leaf blade is long and spear shaped (lanceolate).

**FLOWERS:**

Panicles lax, pale and few flowered.

**FRUITS:**

The tiny seeds are small and windborne.

**IMPORTANCE FOR DESERT LOCUST:**

This plant is of minimal nutritional importance; however it is greatly favoured as a shelter plant and moulting platform. When it is found growing with *Heliotropium* spp. on sandy soils, these places become very attractive to Desert Locust. Where there is rain, and soil moisture is sufficient for egg laying these areas may become classic Desert Locust breeding areas.

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**POACEAE** (Gramineae), *Pennisetum glaucum* (L.) R. Br. (*P. typhoides* (Burm.f.) Stapf & Hubbard): Bulrush millet \*\*\*



#### **GENERAL DESCRIPTION**

A vigorous annual crop, which grows up to 3m high. Widely cultivated by man in areas of low to medium rainfall. It is sometimes planted as a barrier around more productive sorghum crops. The plant grows on a wide variety of soils, but prefers well drained soils.

#### **LEAVES**

The leaf blade is linear to linear-lanceolate, flat, relatively narrow, pointed and dark green. They surround the stem where they are usually surrounded by whitish hairs.

#### **FLOWERS**

Insignificant but are borne on a long compact, cylindrical stiff head, which is typically brown.

#### **FRUITS**

Seeds develop on the long flower heads.

#### **IMPORTANCE FOR DESERT LOCUST**

This plant is very attractive as a food plant, and like other grasses it will be eaten by Desert Locust. The milk stage grains are much sought after by this insect, especially the later instar hoppers and adults, when the leaves have become too tough.

#### **Synonyms**

*P. typhoides* (Burm.) Staph & C.E.Hubb

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**POACEAE** (Gramineae), *Sorghum bicolor* (L.) Moench :

Sorghum \*\*\*



Immature seed head

### GENERAL DESCRIPTION

An annual crop, which grows up to 4m tall and is widely cultivated by man. It grows in areas that are too dry for maize, and grows well in a wide range of soils.

### LEAVES

Blade is lanceolate to linear-lanceolate long, quite broad and toughening with age.

### FLOWERS

The flower heads are large and very variable in size, from 8-40cm.

### FRUITS

Rounded grain initially white (milk stage) changing to one of many different colours depending on the variety.

### IMPORTANCE FOR DESERT LOCUST

This plant is very attractive as a food plant, and like other grasses it will be eaten. The milk stage grains are much sought after by this insect, especially later instar hoppers and adults, and much damage to a crop may occur at this stage.

### SYNONYMS

*Sorghum vulgare* Pers., *Andropogon sorghum* (L.) Brot.

## Glossary

<b>Anther</b>	= Portion of stamen bearing the pollen grains borne on a stalk (filament) in flowers. The Pollen-sack.
<b>Axil</b>	= The upper angle between the leaf and where it joins the stem.
<b>Basal</b>	= At, or forming the base of the stem or leaf.
<b>Berry</b>	= A fleshy fruit usually containing several seeds.
<b>Biennial</b>	= A plant that completes its life cycle in 2 years, germinating in the first year and flowering and producing seeds in the second.
<b>Capsule</b>	= A dry fruit (pod) that splits partly open when ripe and has several internal cells
<b>Calyx</b>	= The sepals of a flower
<b>Ciliate</b>	= Short hairs on the margin of the plant organ
<b>Cylindrical</b>	= Circular, round with straight sides and a circular cross section.
<b>Cyme</b>	= Cymose (adjective), flat or convex flower-head in which the central flowers open first
<b>Deciduous</b>	= Plants or trees that shed their leaves during unfavourable season
<b>Elliptic</b>	= Elliptic leaf, one which is widest in the middle and which tapers evenly to both ends
<b>Erect</b>	= Upright, stiff.
<b>Fissure</b>	= Deep groove or furrow dividing an organ into lobes.
<b>Forb</b>	= Any herb which is not, or does not resemble a grass.
<b>Glabrous</b>	= Smooth not hairy.
<b>Herb</b>	= A plant that contains little woody tissue above ground and which usually dies back

	to ground level during the dormant season.
<b>Internode</b>	= The part of a twig between two nodes
<b>Leaflet</b>	= Any division of a compound leaf.
<b>Linear</b>	= Several times as long as broad, narrow with more or less parallel edges.
<b>Lyrate</b>	= Lyre-shaped, pinnatifid with large terminal lobe and smaller lower lobes.
<b>Mucronate</b>	= (spine/point) at the tip; ending in a sharp point.
<b>Musty</b>	= Rather stale smell.
<b>Node</b>	= The place on a twig or stem where a leaf is attached
<b>Nutlets</b>	= A small, one-seeded portion of a fruit which divides as it matures. The fruits of plants in the families Labiatae and Boraginaceae (e.g. <i>Heliotropium</i> ).
<b>Oblong</b>	= A rectangular shape but with rounded ends.
<b>Oval</b>	= Egg-shaped.
<b>Panicle</b>	= A spreading type of inflorescence or seed-head, as in sorghum.
<b>Peduncle</b>	= The stem or stalk of an inflorescence, or of a solitary flower or fruit.
<b>Perennial</b>	= A plant which lives for more than two years, and which flowers every year.
<b>Perianth</b>	= Calyx and corolla of a flower
<b>Petal</b>	= Inner parts of the flower leaves; they are often large and brightly coloured.
<b>Pinnate</b>	= One with more than three leaflets that are arranged in pairs along a single 'stem' (rachis). They themselves may be divided into pinnae (sing. pinna). There may or may not be a single terminal leaflet.
<b>Pod</b>	= A dry dehiscent fruit or seed vessel, such as is found in many legumes (e.g. soyabeans) which splits down one or both sides when ripe.
<b>Prostrate</b>	= Growing flat on the ground.

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<b>Pubescent</b>	= Covered with fine, fuzzy or short hairs.
<b>Racemes</b>	= (Racemose) inflorescence in which young flowers are above and the oldest are below; each flower on a pedicel along the main axis, usually conical in form, consisting of an elongated axis bearing flowers on short stems. Shaped like a bunch of grapes.
<b>Rosette</b>	= A whorl of terminal leaves on or near to the ground.
<b>Sessile</b>	= Lacking a stem, growing direct from the ground surface-flat.
<b>Shrub</b>	= A small woody plant with several main stems.
<b>Spathe</b>	= An envelope of floral leaves enclosing the flowers.
<b>Spike</b>	= Inflorescence in which flowers arise without stalks (sessile pedicels), flowers are arranged along an expanded stem (peduncle).
<b>Spine</b>	= A stiff, sharp woody outgrowth.
<b>Sprawl</b>	= A To spread untidily across the ground
<b>Stamen</b>	= A long tube growing up from the plant ovary, which receive the pollen grains (on stigma).
<b>Stamens</b> the	= Male parts of a flower, as a number of thin stalks: the tip of the stamen supports the anther from where the pollen is produced.
<b>Stipule</b>	= A leaf-like, or more often scale-like process at the base of the leaf petiole (stalk).
<b>Sub-species</b>	= Different from the main species, generally separated by a number of characters from the principal species, and also having different geographical or ecological criteria, but not different enough to be called a different species.
<b>Synonyms</b>	= One of several names given to the same taxon.

<b>Taxon</b>	= A taxonomic group (or unit, or entity) of any rank.
<b>Translucent</b>	= Light will pass through it, but to appear diffuse.
<b>Trifoliolate</b>	= a compound Leaf with three leaflets.
<b>Tubular</b>	= Long, tube-like.
<b>Undershrub</b>	= An herbaceous plant which has a persistent woody stem base.

## REFERENCES

- Abdalla O. M., 2004.** Ecological field studies on the population dynamics of the solitary desert locust *Schistocerca gregaria* (forskål). Ph. D. Thesis University of Khartoum, Faculty of Agriculture.
- Abdel Rahman, H. E., 1999.** Studies on the effect of different food plant species on the life system of the desert locust, *Schistocerca gregaria* Forskal (Orthoptera:Acrididae). Ph.D Thesis. University of Khartoum, Sudan, 246 pp.
- Al-Hubaishi. A, Muller-Hohenstein. K., 1984.** *An Introduction to the Vegetation of Yemen*. Deutsche Gesellschaft fur Technische Zusammenarbeit (GTZ) GmbH, Eschbron.
- Andrews F.W., 1950.** *The Flowering Plants of the Anglo-Egyptian Sudan*. Vol. I-III.T. Buncle & Co. Ltd., Arbroath, Scotland.
- Bebawi. F. F., Neugebohrn, L., 1991.** *A Review of Plants of Northern Sudan*. Deutsche Gesellschaft fur Technische Zusammenarbeit (GTZ) GmbH, Eschbron.
- Braun. M., Burgstaller. H., Hamdoun. A.M., Walter, H., 1991.** *Common Weeds of Central Sudan*. Verlag Josef Margraf.
- El Amin, H. M., 1990.** *Trees and Shrubs of the Sudan*, Ithaca Press, Exeter, U.K.

46

- Hassan M. H., 1974.** *An illustrated guide to plants of Erkowit*, Khartoum University Press, Khartoum.
- Migahid, A. M., 1996.** *Flora of Saudi Arabia*, Volumes 1,-3, Fourth Edition. University Libraries, King Saud University Press, Riyadh.
- Sahni,K.C., 1968.** *Important Trees of Northern Sudan*. Khartoum University Press, Khartoum
- Tackhom, V., 1956.** *Students' Flora of Egypt* , Anglo-Egyptian Bookshop, Cairo.
- Woldewahid, G., 2003.** *Habitat and spatial pattern of solitarious Desert Locust (Schistocerca gregaria Forsk.) on coastal plain of Sudan*. Tropical Resource Management Papers No. 48, Wageningen University.

### Further information about Desert Locust may be obtained from:

Desert Locust Information Service (DLIS),  
 Food and Agriculture Organization of the United Nations (FAO/UN),  
 Via delle Terme di Caracalla,  
 00153 Rome  
 Italy  
 ecl@fao.org  
<http://www.fao.org/ag/locusts/>

## Inflorescences



head



raceme



corymb



panicle



umbel



spike



verticillate



helicoid cyme

47

linear



oval



oblong



ovate



obovate



deltoid



cordate

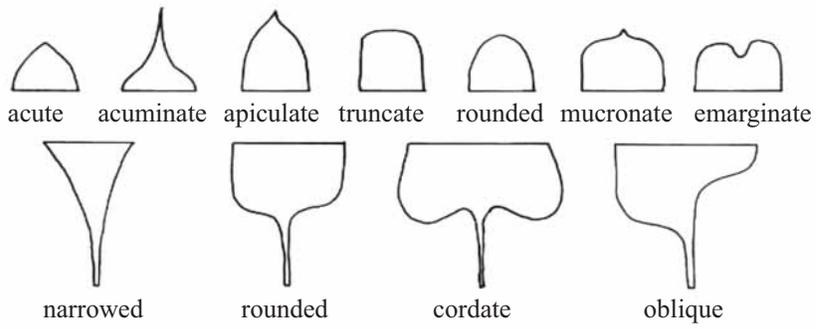


elliptical



lanceolate

### Leaf apex and base



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