



**Morphological observation on the *Oedaleus Senegalensis* Krauss (Orthoptera) with special reference to its phallic complex**

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**Abstract:** The genus *Oedaleus* Fieber, having great importance because of its pest status. The specimens occurring around the cultivated fields, semi-arid, standing crops and rocky areas. The species of *O. senegalensis* contain great variety of variation in its morphological appearance. Besides this, epiphallus bridge comparatively wider, thickening and slightly curved, anterior projections well marked finger like with acute rounded curved boundaries.

**Keywords:** *Oedaleus*, Pest, Morphological, Variation, Epiphallus

**1. INTRODUCTION**

The study and significance of Orthopteroids, has been taken out previously by numerous authors, members of the super family Acridoidea are potentially the most important, i-e; Cheke, and Migrant, (1990) Colvin, (1997), Chandra (1983). *Oedaleus senegalensis*; stands out as the most devastating species. This species is widely scattered throughout the tropical and sub tropical regions, as well as Africa north of the equator, Middle east and Indian sub continent and this species is often associated with mesoxerophilic habitats and can be categorized as graminivorous. In (2003; FAO, were reported the incidence of *O. senegalensis* on fields of Sorghum, maize and millet. (Jago *et al.*, 1993 and Colvin and Holt, 1996; Maiga *et al.*, 2008); were studies the pest status and population density of this grasshopper. Ecological factors are necessary to predict invasion of this pest. (Bak *et al.*, 2007; Fisker *et al.*, 2007, examine the population size during rainfall). This species is known as primary pest of crops and vegetations, cause damage to pastures in Pakistan when their population may increased, (Riffat and Wagan, 2012; Riffat *et al.*, 2013, Riffat and Wagan, 2015). Moreover, (Soomro, and Wagan, 2014; Soomro, and Riffat, 2015, a,b,c) were studies on Oedipodinae. During the current study of the field it is observed that *Oedaleus senegalensis* has a priority for arid and semi arid areas in country. *Oedaleus senegalensis* is considered as the much important pest species, due to its economic mode; In spite of this it has a certain importance because of the damage that it causes to consumer crops (maize, bajra, rice, wheat), almost seedlings or nursery and un ripe stages in fields. This species were considered as pest because it causes damage on crops in various parts of Pakistan.

**2. MATERIALS AND METHODS**

Adult specimens of *Oedaleus senegalensis* were collected from various localities of Pakistan i-e grassland, dry vegetation, rangelands, along the roadsides and rocky areas etc. The collection of grasshoppers was made with the help of insect net and was killed by potassium cyanide in standard entomological killing bottles. The specimens were not left too long (1/2 hours) in cyanide because the color of specimens may turned into black or they may be spoiled. The insect pins were inserted on the pronotum posterior to transverse sulcus an a little to the right of the median dorsal carina. The specimens were then stretched on the stretching board and attention was paid to the antennae, wings and legs in order to display important taxonomic characters. Dust particles and other un desire able matter were removed with the help of dry camel hairbrush.

The fully dried specimens were removed from stretching boards and were stored in standard entomological boxes with labels showing locality, date of collection and collector name. Nephthalene balls were placed in boxes to prevent the specimens from the attack of ants and other insects. The method of softening the abdominal terminalia was not followed by immersing these in hot water, but by relaxing the whole insect over water in a small dessicator (to which a few drops of phenol / 70 % alcohol had been added) to prevent fungal growth was used. It may depend's upon the size of the insect, age and general state of preservation, the period of relaxing was usually about 24 hours .Finally the micro vials were pinned through their rubber stopper beneath the insects from which the phallic structure had originally been extracted.The

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spermatheca lies just above the vagina was also removed. The diagrams were drawn with the help of "Ocular square Reticule" placed in right eye piece of the stereoscopic dissecting binocular microscope. All the measurements are given in the millimeter.

#### Depository:

The type material has been deposited in the Sindh Entomological Museum (SEM), Department of Zoology, University of Sindh Jamshoro, Pakistan.

### 3. RESULTS

#### Description of *Oedaleus senegalensis*:

Medium in size. Antennae filiform, 26-27 segmented longer than head and pronotum together. Head sub-globular, shorter than pronotum. Fastigium of vertex little longer than wide, narrowing anteriorly; margin raised. Fastigial foveolae short, triangular; frontal ridge flat and wide. pronotum tectiform and strongly constricted, median carina entire, not crossed by posterior sulcus, and not low. Tegmina well developed; wings hyaline towards base. Hind femur with three indistinct oblique transverse dark bands on outer upper marginal and medial areas extending onto inner surface. Hind tibia with dark basal ring, slender, slightly shorter than hind femur, with 13 inner and 12 outer black tipped spines. Claws shorter. Arolium small.

#### Phallic complex

Apical valve of Penis almost parallel to the valve of cingulum; valve of penis, thick, wider, tapered at apex with acute rounded apices. Valve of cingulum deep, slightly thin, narrowing at apex with sub acute obtuse rounded apices. Arch of cingulum large, stout, flattened. Basal bridge fold with ventro expansions, knot like, rectangular. Apodemes of cingulum moderate, stout, thick and directed anteriorly with pointed acutangular apices. Zygoma visible, having furrow at margins. Rami thick vertically extending into the sheath dorsally lobe like. Gonopore process

convex, incurved, widened anteriorly with truncated apices. Ejaculatory duct smaller and produced anteriorly.

#### Epiphallus

The epiphallus bridge shaped, bridge comparatively wider, thickening and slightly curved. Anterior projections well marked, finger like with acute rounded boundaries, reaching only one half of the ancorae; posterior projections with deep and shallow on inner and outer margins respectively. Lateral plates fairly wide. Ancorae straight upward, moderate, thick, wavy like, acutangular at apex, deep and rounded at base. Lophi laterally placed, elongated conical, produced anteriorly in finger like form, with acute apices, median lobes half times wider as outer lobes; ending in small with knob like projections, acutangular. Besides the lateral plates, small oval circular sclerites.

#### Coloration:

Generally greenish brown in color. Pronotum with X- shaped markings of white and brown stripes. Tegmina with two brown bands at base and scattered tetragonal spots. Wings transparent, basal part yellowish green, dark band not touching their posterior margin in male the apices shadowed. Hind femur yellow on inside and without dark bands. Hind tibia light reddish on inner aspect and yellowish on outer aspect, with distinct apical yellowish band.

#### Female:

Cerci short, conical, slightly compressed with angular apex. Ovipositor short, robust, valves stout and curved.

#### Spermatheca:

The spermatheca with pre-apical diverticulum finger like, slightly larger, laterally placed, obtusely rounded at apex. Apical diverticulum sac like, broadened, elongated with rounded process at base.

Table 1. Measurements of different body parts of *Oedaleus senegalensis* Krauss.

Body Parameters	Male (n = 9)		Female (n = 11)	
	(Mean ± Sd)	(Range)	(Mean ± Sd)	(Range)
Length of Body	21.55± 7.48	17-21	31.08±14.31	23-32
Length of Antennae	11.0± 4.24	9-12	12.45± 3.83	10-13
Length of Pronotum	4.55± 1.18	4.2-5	7.99± 5.46	5.3-9
Length of Tegmina	21.44±4.71	19-23	30.36 ±10.41	26-35
Maximum width of Tegmina	4.61 ±10.39	4.3-5	6.12 ± 2.62	5.4-7
Length of hind Femur	14.55 ± 5.04	12-14	14.18 ±10.36	15-19
Maximum width of hind Femur	3.46 ± 1.12	3.2-4	4.70± 1.27	4.2-5
Length of hind tibia	12.22 ± 2.34	11-13	16.09± 3.62	14-17

**Remarks:**

**Remarks of species:** This species is very closely related to *O. nigrofasciatus* in having general body form but can easily be separated by rounded sub acute pronotal shape. Whereas in *O. nigrofasciatus* it is oval and by the other characters as noted in the keys and description. This species has been

collected from the cultivated fields of Jowar, maize and wheat. Ahmed ( 1980) recorded the species from all the provinces of Pakistan except Punjab . Wagan (1990) Wagan & Solangi (1990), also reported this species from different parts of Sindh while Baloch ( 2000) recorded from the Punjab.

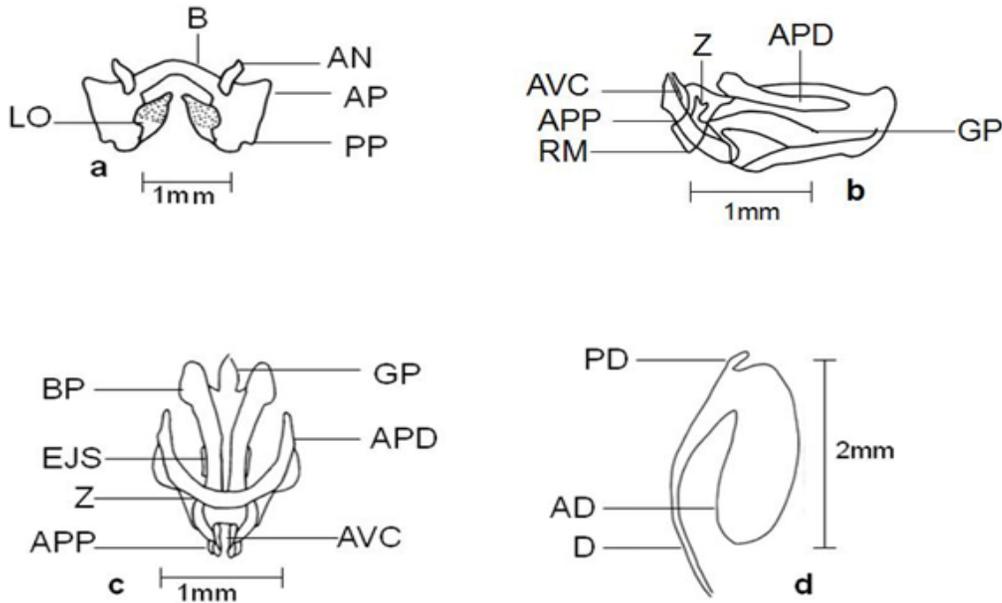


Fig 1. a. Epiphallus, B. Endophallus and Cingulum lateral view, C. Same dorsal view and d. Spermatheca of male genitalia of *Oedaleus senegalensis*.

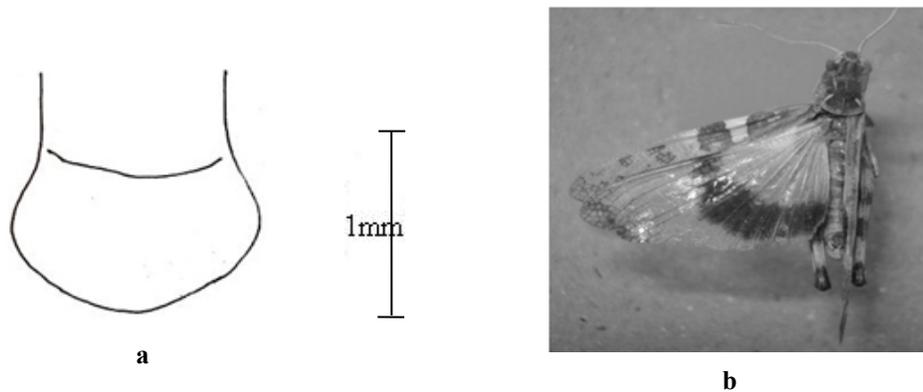


Fig. 2. a. Pronotum, dorsal part and b. Pronotum, dorsal part, male genitalia of *Oedaleus senegalensis*.

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