



Biodiversity of Acrotylus (Acrididae:Orthoptera) with special reference to its host plants in Thar Desert, Sindh.

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Abstract: At the present incidence of 03- Acrotylus species i-e: Acrotylus longipes longipes(Charpentier, 1845), Acrotylus humbertianus Saussure, 1884 and Acrotylus longipes subfasciatus Bei-Bienko, 1948, along with their host plants association was observed. During field survey it was found that Acrotylus infesting various part of plants i-e: foliage, flower, leaf and stem mostly adult feed on leaves. Beside this, greater No: was reported from undisturbance habitats and there is significant morphological difference in these 03-studied species.

Keywords: Biodiversity, Acrotylus, Host plant, Infesting habitat.

1. INTRODUCTION

Thar desert is considered as the seventh largest desert on planet earth and third in continent Asia. Thar desert covers large area of Pakistan and India which is 175,000 square kilometers. Grasshoppers represent perhaps the most conspicuous of all insect pests and are abundant insects of dry fauna Sindh zone in general and Thar in particular. Although, the desert of Sindh must harbors a very rich and highly specialized grasshoppers fauna, but only a few species are known from this area and these species are very peculiar in their habitat. Considerable taxonomic work has been carried out on the Orthoptera of plain, cultivated and semi-mountainous area by Tandon and Shishodia (1969 and 1989), Tandon 1976), Usmani and Shafee (1980 and 1990), Bhowmik (1985), Shishodia (1987,1997 and 1999), Kumar and Virktamath (1991a,b), Murlirangan et al., (1992), Hazra et al., (1993), Priya and Narendran (2003), Riffat and Wagan (2008, 2010a,b), Mukhtar et al., (2010), Nayeem et al., (2012). But there is no detail account on the biodiversity of grasshopper from Thar Desert with exception of Uvarov (1977) and Riffat et al., (2013). Keeping in view the above facts, the present attempt is aimed to study the Acrotylus genus which is most dominant and widely distributed species and show a very high degree of biological diversity in this dry and diverse land.

2. MATERIALS AND METHODS

Specimens were collected by insect-nets from various fields surrounding by maize, wheat, grasses and other vegetation. Specimens were brought to lab, killed, pinned and examined by standard entomology method described by Riffat and Wagan (2012). After

examination photograph were obtained by Canon IXY430F digital camera. Measurements of all body parts were made using vernier caliper and ocular graph filled in microscope. All the collected material deposited in Sindh Entomological Museum (SEM). All the species are arranged alphabetically for ease to reference. Furthermore, the host plants were also analyzed by observing the Acrotylus feeding in the field and where the large No: of specimens were collected i-e: Acrotylus longipes longipes, A.humbertianus and A.longipes subfasciatus.

3. RESULTS AND DISCUSSION

Three known species of Acrotylus from different localities viz: Umerkot, Chachro, Mithi, Nagarparkar and Islamkot were captured from agricultural, dry, and semi-mountainous areas of Thar. Their systematic status, identification key and other comparison is under:

3.1 Key to species of Acrotylus species occurring in Thar desert

1. Apex of tegmina with distinct dark speckles, wings with incomplete dark band interiorly reaching anal vein; mesosternal inter space about twice wider than its greatest length; hind tibia with 10 inner spines. (Fig 1. b,c).. Acrotylus humbertianus Saussure.

Apex of tegmina without dark speckles, wings with or without dark short dark band; mesosternal inter space about three times wider than its greatest length; hind tibia with 11 inner spines. (Fig 1. 2).

2. Wings without bands.....Acrotylus longipes longipes(Charpentier)

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Wings with short lunar shaped band. Fig.1 d.e...*Acrotylus longipes subfasciatus* Bei-Bienko.

3.2 Systematic status of Genus *Acrotylus*

Order: Orthoptera
Suborder: Caelifera
Family: Acrididae
Tribe: Acrotylini
Genus: *Acrotylus*

3.3 Diagnosis feature of *Acrotylus* Fieber, 1853

Body is smaller to medium in size, rugose and hairy. Antennae filiform with 24-segments, ringed with dark brown, longer than head and pronotum together. Head is short, slightly prominent, fastigium of vertex angular, concave with raised lateral carinulae. Pronotum short tuberculate, constricted and wings hyaline colored at base, with or without band. Hind femur slender and yellowish, hind knee rounded. Supra-anal plate elongate or curved with obtuse apex.

Distribution:

Pakistan, India, Iran, Sri Lanka, Europe and Greece.

1. *Acrotylus longipes longipes*, (Charpentier, 1845)

Material examined.- UK. SEM.276, 5 Males, Cluster bean, 3 September 2014.

Morphometry: ♂(n=05), LB= 14.6±1.01, LA= 4.32±0.78, LP= 3.05±0.28, LT= 15.7±1.12, MWT= 3.02±0.41, LF= 8.15±0.28, MWHF= 2.8±0.5, LHT= 7.17±0.44.

Comparative account:

This species is very closely related to *Acrotylus insubricus insubricus* (Scopoli, 1786) due to following characters viz: Tegmina dirty light brown along with slight spot on the margin while wings light yellow. Tibia pale in color easily distinguish from the other species of this genera. Usually this insect is in seen and mostly collected from mixed vegetation of grasses and herbs from Thar Desert. Earlier, Bughio (2012) reported 4♂ and 1♀ of this species from Larkana (Sindh). At the present we have collected fair number of male from Thar Desert and confirmed its presence in Sindh. It was also notice that this species prefer to live in area with thin vegetation and it can survive in dry and harsh condition.

3. *Acrotylus humberianus* Saussure, 1884

Material examined.- UK. SEM.271, 25 Males, 20 Females, Barley, 15 July 2014.

Morphometry: ♂ (n= 25), ♀ (n= 20),
 LB(♂)= 15.87±3.84, ♀)= 12.91±20.86, LA(♂)= 6.51±2.20, ♀)= 6.81±2.36
 LP(♂)= 3.15±0.91, ♀)= 3.92±0.75, LT(♂)= 10.6±22.81, ♀)= 21.1±4.57
 MWT(♂)= 2.77±1.01, ♀)= 3.63±1.42, LF(♂)= 9.77±1.79, ♀)= 11±3.16
 MWHF(♂)= 3.2±0.12, ♀)= 3.45±8.02, LHT(♂)= 8.67±1.83, ♀)= 9.62±2.03.

Comparative account:

This species resemble with *Acrotylus patruelis* (Schaf) having long tegmina and arolium, wings coloration yellowish with incomplete dark bands, on the surface this is peculiarity of this species. Earlier, Yousuf (1996) and Ahmed (1980) reported this species from the various provinces of Pakistan. Moeed (1966), Wagan (1990), also reported this species from different parts of Sindh while Baloch (2000) recorded it from Punjab. Presently, all material has been captured from cultivated fields of barley, vegetables as well as from the rocky areas comprise on scattered and thin grasses.

3. *Acrotylus longipes subfasciatus* Bey-Bienko, 1948

Material examined.- UK. SEM.272, 22 Males, 18 Females, Grassy field, 18 July 2014.

Morphometry: ♂ (n=22), ♀ (n=18),
 LB(♂)=16.70±5.29, ♀)=20.55±2.04, LA(♂)= 6.83±13892, ♀)= 6.68±2.71
 LP(♂)= 3.30±1.40, ♀)= 4.0±00, LT(♂)= 17.45±16.50, ♀)= 20.11±4.78
 MWT(♂)=2.87±2.03, ♀)=3.78±1.24, LF(♂)= 8.62±1.22,
 ♀)= 11.0±2.00 MWHF(♂)= 3.05±0.48, ♀)= 3.38±1.03, LHT(♂)= 3.30±5.44, ♀)= 9.24±2.13.

Comparative account:

This species is very closely related to *Acrotylus longipes longipes* (Charpentier) in having middle leg very large and slender inner spur of hind tibia also long and wings yellowish in coloration, but it can easily be separated from the same in having wings with a short lunar shaded dark band and by the other characters as noted in the keys and description.

Earlier, Wagan and Naheed (1997) reported 2♂ and 2♀ of this species from cultivated fields of maize, vegetables as well as from rocky areas in grassy fields of various districts of Punjab. Currently, we have reported large No: of specimens from Thar and mostly the insects were captured from grasses i-e: Broom

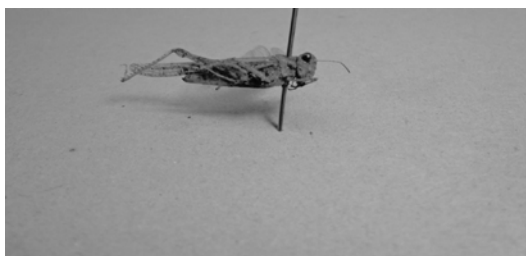
Brush, Snow Bush and Milk Hedge, while some were also collected from dry region of Nagarparkar and Islamkot.



(a)



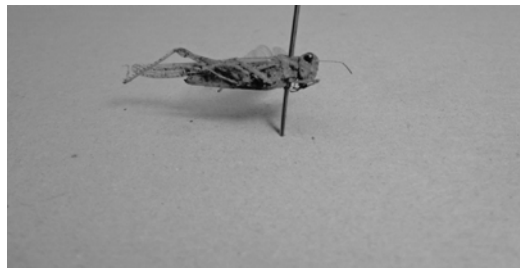
(b)



(c)



(d)



(e)

Fig.1: (a) *Acrotylus longipes longipes* ♂ (b) *Acrotylus humbertianus* ♀ (c) *Acrotylus humbertianus* ♂ (d) *Acrotylus longipes subfasciatus* ♀ (e) *Acrotylus longipes subfasciatus* ♂.

Abbreviation: LB=Length of body, LA= Length of Antennae, LP= Length of Pronotum, LT= Length of Tegmina, MWT= Maximum width of Tegmina, LF= Length of hind femur, MWHF= Maximum Width of hind femur, LHT= Length of hind tibia.

Table 1: Showing the Occurrence of *Acrotylus* species from different host plants.

Species	Crops			Vegetables			Cereals			Spice	Grasses		
	Barley	Mill et	Cotto n	App le gour d	Clust er bean	Mushro m	Mai ze	Kidne y bean	Whe at	Chili es	Broo m Brush	Sno w Bus h	Milk Hedge
<i>Acrotylus longipes longipes</i>	-	-	-	-	+	-	-	-	-	-	+	-	-
<i>Acrotylus humbertianus</i>	+	-	-	-	+	-	-	+	+	-	+	+	+
<i>Acrotylus longipes subfasciatus</i>	+	-	-	+	+	-	+	-	-	-	+	-	+

Note: + Available- Not available.

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