



MASS REARING OF *ACRIDA EXALTATA* (ORTHOPTERA: ACRIDIDAE) UNDER THE LABORATORY CONDITIONS

MUHAMMAD YOUNUS, MUHAMMAD WASEEM, MUHAMMAD ZAIN-UL-ABEDIN, MUHAMMAD SHAHZAD

Department of Zoology, Cholistan University of Veterinary and Animal Sciences, Bahawalpur, Bahawalpur.

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ABSTRACT

Pilot study was carried out in order to rear *Acrida exaltata* (Walker) under laboratory conditions. Target insects were reared on two diets *Pennisetum glaucum* and *Saccharum officinarum*. Culture was maintained for about 8days in the laboratory in order to observe feeding preference, moulting and fecal production. It was noted that insects feed more on *P. glaucum* (bajra) leaves compared to *S. officinarum* (sugar cane). Mortality and molting were also noted during this time. However, there was no significant difference in Mortality of insects on these diets.

1. INTRODUCTION

Grasshoppers are the largest and most diverse group of insects. Grasshoppers have several advantages for such studies, relating to its great body size easy catch ability and high dominance so, that it became a main invertebrate group for biological indication in its wider sense. They are often the main invertebrate consumer in grasslands and are to be important food source for many groups of predators e.g., birds, lizards etc. The grasshopper insect fauna generally is grouped as short-horned grasshopper (Caelifera) and long-horned grasshopper (Ensifera).

Short horned grasshopper, (family Acrididae), any of more than 10,000 species of insects (order Orthoptera) that are characterized by short, heavy antennae, a four valved ovipositor for laying eggs, and three segmented tarsi (distal segments of the leg).

They are herbivorous and include some of the most destructive agricultural pests known. The plague, or migratory, species are called locusts.

Short horned grasshoppers' range in size from 5 mm to 11 cm (0.2 to 4.3 inches) in length. The shape of the body may be long and slender or short and stout. Many species are green or straw-colored, which helps them blend into their surroundings. The hind legs are adapted for jumping, with greatly enlarged femurs. Some species have wings, whereas others are wingless. Among the winged species, the males can produce characteristic noises by rubbing the front wings together or by drawing the hind legs across the edge of the wings. Most species have a pair of tympanal (hearing) organs at the base of the abdomen. A female short horned grasshopper lays about 100 eggs in the soil. The eggs hatch after a rest period, and newly hatched nymphs, miniature replicas of the adults, pass through a series of molts before they become adults. In temperate regions one to several broods are produced each year.

*Corresponding Author: dr.waseemcuvas@gmail.com
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Grasshoppers are the main important part of the class insecta and family Acrididea which are harmful in the agricultural field for the crops. Pakistan is the most significant agricultural country in this world; it comprised the major zone of our financial system. There are so many cash crops, fruits, vegetables are cultivated but these crops are more or less low due to serious harm of insects. Full adult male grasshoppers develop up to 28- 37 mm whereas female develop up to 34-50 mm.

Acrididae may be either gregarious and migratory, or solitary and sedentary, but any solitary species may transform into a gregarious or migratory species. The grasshopper’s favorite foods are grasses, leaves and cereal crops. One particular grasshopper – the Shorthorn grasshopper only eats plants, but it can go berserk and eat every plant in sight – makes you wander where they put it all A Grasshopper does not actually ‘jump’. What they do is use their legs as a catapult. Grasshoppers can both jump and fly and they can reach a speed of 8 miles per hour when flying. There are about 18,000 different species of grasshoppers

Grasshoppers usually have large eyes, and are coloured to blend into their environment, usually a combination of brown, grey or green. In some species the males have bright colours on their wings that they use to attract females. A few species eat toxic plants, and keep the toxins in their bodies for protection. They are brightly coloured to warn predators that they taste bad. Grasshoppers live in fields, meadows and just about anywhere they can find generous amounts of food to eat. A grasshopper has a hard shell and a full-grown grasshopper is about one and a half inches, being so small you would not think they would eat much – but you would be so wrong – they eat lots and lots – an average grasshopper can eat 16 time its own weight.

Grasshoppers are herbivorous insects of the suborder Caelifera in the order Orthoptera. To distinguish them from bush crickets or katydids, they are sometimes referred to as short-horned grasshoppers. Species that change color and behavior at high population densities are called locusts.

2. MATERIALS AND METHODS

Sampling Sites

Grasshoppers will be collected from Cholistan desert. All sites will be visited after fortnight and most visits will be carried out at dawn time especially in the month of June-October.

Collection of Specimens

Adult specimens of grasshoppers will be collected from different localities of Cholistan desert and sampling will be made from agricultural land, open grounds, vegetation, herbs, shrubs, bushes, etc. Samples will be collected by insect hand net and some by hand picking. Collected material will be transferred to plastic bottles and then brought to Laboratory. All materials such as Magnifying lens, Vernier calipers, Graduated scale, conical flasks, Beakers, Petri dish, Aluminum foil, China crucible, digital scale, microwave oven, Muffle furnace, agate pestle and electric mortar were of high quality.

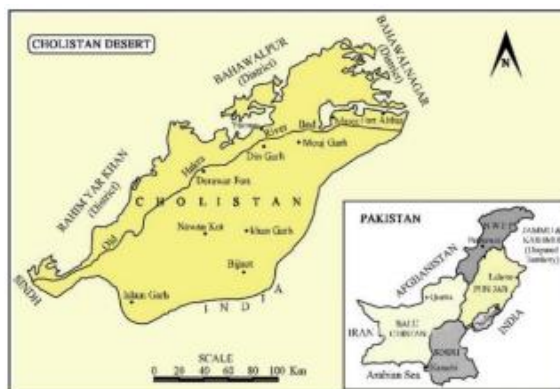


Figure 1. Map of Cholistan Desert

Killing & Preservation

Material will be brought to Department of Zoology, Cholistan University of Veterinary and Animal Sciences, Bahawalpur. Method for killing will be adapted by (Riffat and Wagan 2015) Specimens will be killed by using Potassium cyanide or Chloroform in standard entomological killing bottles for 5-10 minutes. Samples were not left to long because the color of the specimen would be change. Fully dry insects will be preserved at Department of Zoology, with labels showing collection date, habitat, locality,

and collector name. Naphthalene balls will be placed in boxes to prevent the attack of other insects.

Identification

Specimens were identified through bibliographies by (Uvarov 1966 & 1977), (Riffat and Wagan 2015).

Statistical analyses

The lengths or widths of body parameters will be measured by ImageJ software (1.48v) and MS Excel 2007. Relationship among parameters and different species will be determined using repeated measures ANOVA with Tukey post-test.

3. RESULTS

During the present study fair numbers of *Acrida exaltata* were reported from agricultural lands of Cholistan Desert. Samples were brought to the laboratory where the separation and identification process took place. About 100 specimens were selected and put in two jars one having *Pennisetum glaucum* (Bajra) and *Saccharum officinarum* (Sugar Cane) leaves. Culture was maintained for about 8 days in the laboratory in order to observe feeding preference, moulting and fecal production. It was noted that insects feed more on *P. glaucum* (bajra) leaves compared to *S. officinarum* (sugar Cane). Mortality and molting were also noted during this time (Table.1).



Figure 1 *Acrida exaltata*

4. CONCLUSION

Pennisetum glaucum (Bajra) was found more preferable food plant of *Acrida exaltata* it might be nutritional value of this plant.

5. CONFLICT OF INTEREST

All authors have declared that there is no conflict of interests regarding the publication of this article.

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Table 1. Rearing of *Acrida exaltata* under laboratory conditions

(FRIDAY TO MONDAY)

Before			After			
Bottle No.	DIET	FOOD WEIGHT	FOOD WEIGHT	FEACAL MATERIAL	MORTALITY	MOLTING
01	<i>Pennisetum glaucum</i>	10g	2.03	0.35	03	Yes
02	<i>Saccharum officinarum</i>	10g	4.10	0.20	06	Yes

(MONDAY TO THURSDAY)

Before			After			
Bottle No.	DIET	FOOD WEIGHT	FOOD WEIGHT	FEACAL MATERIAL	MORTALITY	MOLTING
01	<i>Pennisetum glaucum</i>	10g	2.150	0.443	04	Yes
02	<i>Saccharum officinarum</i>	10g	3.993	0.282	02	Yes

(TRIAL-3 FRIDAY TO MONDAY)

Before			After			
Bottle No.	DIET	FOOD WEIGHT	FOOD WEIGHT	FEACAL MATERIAL	MORTALITY	MOLTING
01	<i>Pennisetum glaucum</i>	10g	2.04	0.36	04	No
02	<i>Saccharum officinarum</i>	10g	3.80	0.30	08	Yes