

THE EARWIG, *FORFICULA SENEGALENSIS* OF KATSINA CITY, NIGERIA

Aliyu Umar Mohammed*

Department of Biology, Federal College of Education Katsina, Katsina State, Nigeria

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ABSTRACT

Two hundred adults of *Forficula senegalensis* were collected from five wards of Katsina metropolis, the capital city of Katsina State, Nigeria, between September 5th and November 5th, 2013. The specimens were then kept in transparent round plastic containers of 4 cm height and 6 cm diameter in the laboratory at temperatures ranging from 33°C to 44°C. The adults were anesthetized with formalin and pinned before being displayed in the museum of the Biology department of the Federal College of Education, Katsina. Pinned adults were photographed with a Samsung E15 digital camera. Adults were identified as *Forficula senegalensis* Audinet-Serville, 1839 based on comparison with plates on The Earwig Research Centre. The average body length of a male is 6.8 mm and that of a female is 8.7 mm on the other hand the average length of head of a male was 1.3 mm and that of a female was 1.6 mm. The most distinguishing structure of the males is the cerci which are also curved while the cerci of a female are straight. The species of earwigs present in Katsina State, Nigeria is *Forficula senegalensis*. This finding is important because earwigs can be used to control certain pests.

Keywords: Earwig, *Forficula senegalensis*, Katsina, Foreps, Pronotum.

INTRODUCTION

The Earwigs are found all over the world. However much of their biology is yet to be studied indepth. There are about 2,200 species identified and 83 species are recorded. The Earwigs belong to the order Dermaptera which is made up of 11 families Karschiellidae, Diplatyidae, Pygidicranidae, Apachyidae, Anisolabididae, Labiduridae, Forficulidae, Spongiphoridae, Chelisochidae, Arixeniidae, and Hemimeridae (Haas and Klass, 2003). In Eastern Africa, a total of 167 species have been reported (Haas, 2005; Haas and Hauser, 2005). There are 54 species identified in Kenya (Haas, 2005; Haas and Hauser, 2005; Zang, 2011). The majority of Dermaptera (the other nine families) are typical earwigs, belonging to the Forficulina” (Jarvis *et al.*, 2005).

The earwig is a nocturnal insect and spends the entire daylight period hiding under trash, inside book pages or in dark crevices (Berleur *et al.*, 2013), under stones or in leaf litter near streams in evergreen broad-leaved forests etc. When frightened, they rush to escape. Their body

length is 1.5 cm, with females slightly larger than males.

The most distinctive feature of earwigs is the pair of forceps on the tip of the abdomen. On the male the forceps are strongly curved, in the female they are nearly straight. The adult is a somewhat flattened elongated insect, dark red-brown in color, with short wing covers. It seldom flies (Klass and Raffensperger, 1973). Their abdomen is cylindrical and narrowest in the middle in the males. The cerci of *D. flavicollis* larvae are nearly twice as long as the body, but the cerci in adults is reduced to single-segmented, short forceps. Male maritime earwigs use two pinchers or forceps protruding from their abdomen as weapons in the fight for food and females. These pinchers are also used to capture prey and for defense (Grimaldi and Engel, 2005). Males bear a pair of asymmetric forceps, where one forcep (right versus left) is longer and more curved than the other. The males use the strongly curved forcep to hook over and lock on to the abdomen of another male during a battle (Sciencedaily.com, 2012).

*Corresponding author e-mail: wooddust.comp@yahoo.co.uk

MATERIAL AND METHODS

Study area

Katsina State is 1696 feet above sea level, it is located between 12°15' N 7°30' E and 12° 25' N 7.5°E. It has an area of 24,194 km² (Fig 1), with

a population of 3,878,344 million and a population density of 160.3/km². The climate of Katsina State is characterized by two well marked seasons, the rainy season, extending from May until September and the dry season from October to April.



Figure 1. Katsina State showing sampled town and local government areas.

Laboratory procedure

Earwigs were collected based on the method of Zack *et al.* (2010) briefly as follows: a transect of 5 pitfall traps was placed at each site, with 10-m intervals between traps. Pitfall traps consisted of transparent plastic cups with an open-top diameter of approximately 11.5 cm and a depth of approximately 8.25 cm. Cups were buried flush with the soil. Each trap was covered with an X shaped set of 7.5-cm-high runners with a span of 46 cm from the center of the trap. The

runners were designed to increase the functional trap perimeter (Morrill *et al.*, 1990). A 30.5 × 30.5-cm lid was placed over the runners and in the center of the trap. Cups were filled to a depth of approximately 2.5 cm with propylene glycol (Sierra®) diluted 1:1 with water. Traps were collected approximately every week, from 5 September 2013 to 5 November 2013. All 5 traps were pooled into a single sample. Voucher specimens of earwigs are deposited in the museum of department of biology, FCE Katsina, Nigeria.

RESULTS

Two hundred adults of *Forficula senegalensis* were collected from five wards of Katsina city, the capital city of Katsina State, Nigeria, between September 5th and November 5th, 2013. The specimens were then kept in transparent round plastic containers of 4 cm height and 6 cm diameter in the laboratory at temperatures ranging from 33°C to 44°C. The adults were anesthetized with formalin and pinned before being displayed in the museum of the Biology department of the Federal College of Education,

Katsina. Pinned adults were photographed with a Samsung E15 digital camera. Adults were identified as *Forficula senegalensis* Audinet-Serville, 1839 based on comparison with plates on the Earwig Research Centre. The average body length of a male is 6.8 mm and that of a female is 8.7 mm on the other hand the average length of head of a male was 1.3 mm and that of a female was 1.6 mm (Table 1). The most distinguishing structure of the males is the cerci which are also curved while the cerci of a female are straight (Plate 1).

Table 1. Measurements of bodily structures of *Forficula senegalensis*.

Criteria	Adult	
	Male	Female
Average Body length (mm)	6.8	8.7
Average Antenna length (mm)	4.7	6.8
Average Head length (mm)	1.3	1.6
Average Head width (mm)	1.4	1.7
Average Pronotum length (mm)	1.05	1.22
Average Pronotum width (mm)	1.09	1.29

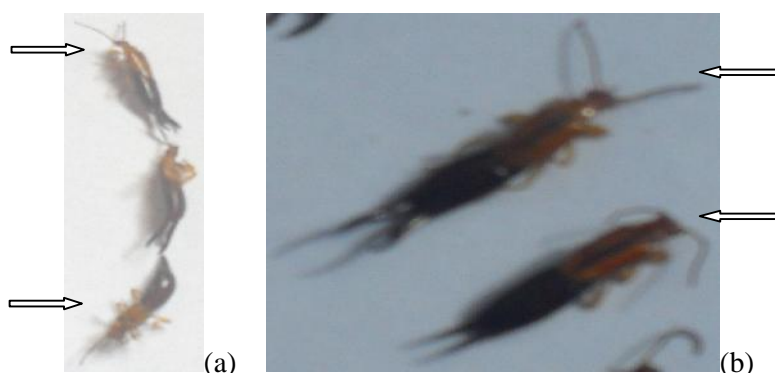


Plate 1. (a) adult males (Left arrows) and (b) females (Right arrows) of *Forficula senegalensis*.

DISCUSSION

The head, forewings and squamae of adults are dark brown, the abdomen and forceps are black, and the pronotum has a pattern of dark brown and ivory colors, which varies between individuals. The obtained results indicate that the average body length of a female is 6.8mm while that of a female is 8.7mm (Table 1). The head increases in size with development but its average length is 1.3mm in females and 1.6mm males. On the other hand average head width is 1.4 in females and 1.7 in males. The average length of the pronotum is 1.05 mm in females and 1.22mm in males. The observed sizes of *Forficula senegalensis* reported herein varies

according to the site of sampling in addition the food consumption of a family group is proportional to its size (Kolliker, 2007).

The cerci metamorphose into a pair of forceps in the adults. The forceps are the most outstanding characteristic of the forficuline earwigs. They are derivatives of cerci, which are multisegmented in many other Polyneoptera as well as *Zygentoma* and *Archaeognatha* (Klass and Raffensperger, 1973).

CONCLUSION

The species of earwigs present in Katsina State, Nigeria is *Forficula senegalensis*. This finding is

important because earwigs can be used to control certain pest in Katsina city, as has been reported elsewhere by previous research.

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