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Research Article

The diversity of cockroaches in kolli hills of Namakkal District, Tamil Nadu

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Abstract

We undertook a survey of Cockroach fauna in Kolli hills of Namakkal district - Tamil Nadu. The Kolli hills is the evergreen forest of eastern ghats, which is rich in biodiversity of fauna and flora. The Kolli hills is about 1000-1300 meters in height and cover an area of 280 km and it has 72 hair pin bends to reach the top of the Kolli hills. In this survey, there are about 90 cockroaches were captured from five densely forest areas of kolli hills. The cockroaches were collected from the decayed woods, leaf litters, under the stones and barks of decayed woods. All the cockroaches were captured early in the morning from 7.00 am to 11 am. The collected cockroaches were identified with the help of standard literature, books. This results shows that the cockroach fauna in kolli hills and their population density in different regions of kolli hills were described. Of collected species 27.7% were *Blattaorientalis*, 24.4% were *Pycnoscelussurinamensis*, 22.2% were *Blattellagermanica*, 20% were *Thereapetveriana* and 5.5% were *Periplanetaaustralsiae*. The study results shows that the *Blattaorientalis*, *Pycnoscelussurinamensis* was the highly distributed species than others.

Keywords: Eastern Ghats, Kolli hills, Cockroaches

Introduction

Cockroaches are an oldest insect of the order *Blattaria* (or) *Blattodea*, the name cockroach, has been derived from Spanish Cucaracha. Cockroaches are swift runners, poor fliers, and nocturnal in habits. Globally *Blattariae* comprises about 5000 species under 398 genera in 28 families (Hanitsch, 1917). In India there are a total of 186 species under 58 genera in 12 families. The primitive (or) ancestors of cockroaches have been existence for about 350 million years (or) since early carboniferous times. There are 3500 to 4000 species have been identified. Thirty species are associated with human habitations. Cockroaches are Omnivores; but they prefer to eat food sources such as sweets, cheese, starches, plants, vegetables and fruits (Jirage, 2011).

Cockroaches have an Oval, flattened shape, long antennae. Cockroaches molt periodically (or) shed their nonflexible exoskeleton in order to grow. Cockroaches have an three life stages (i) egg case or Ootheca, (ii) Nymph and (iii) adult. Cockroaches play a significant

role in recycling of decaying plant materials. In addition to they are extremely important in many food chains and part of food for carnivores such as birds, lizards, rats and other small mammals. The role of cockroaches in the transmission of diseases and the studies indicate that about 40 different pathogens are naturally carried by roaches. (Such as polio, leprosy, bubonic, plague, dysentery, pneumonia, typhoid fever etc., Cockroaches lay their eggs called Ootheca, which contains upto 16-20 eggs each. The most common roach are the American cockroach (*Periplanetaamericana* and the German cockroach (*Blattellagermanica*) (Robinson, 2005; Uneke, 2007) The kolli hills is located in Namakkal district of Tamil Nadu. It is a part of Eastern Ghats of ever green forest and rich in flora and fauna. The kolli hills is about 1000 to 1300m in height and cover an area of approximately 280 km and has 72 hair pin bends. In this survey, five densely forest areas were chosen as sites to collect Cockroach sample for this study.

Materials and Methods

Study description

The survey was carried out in five densely forest areas of Kolli hills of Namakka district- Tamil Nadu. Samples were collected in January, February and March of 2012 between the hours of 7.00 am to 10.00 am. Samples were identified between April and May 2012, using standard literature and relevant books.

Sample collection

There are five places were chosen and 90 adult cockroaches were collected from the selected places 1) 25 cockroaches were collected from Semmedu, 2) 22 cockroaches were collected from Sengarai, 3) 20 cockroaches were collected from Keezhalavavu, 4) 18 cockroaches were collected from Vasalorpatti 5) 5 cockroaches were collected from Aarapalli.

Sample identification

All the cockroaches were captured using simple gloved hands and sweeping methods and kept in a hole-punched plastic container. The alive samples were transported to the laboratory. The cockroaches were identified using their morphological and taxonomical characteristics with the help of standard literature and books.

Results

In this study, 90 adult cockroach of five species were captured from five places of densely forest areas in Kolli hills of Namakkal district of Tamil Nadu in India. The collected samples were identified, which included 1) *Blattaorientalis* were 25 cockroaches- 27.7%, 2) *Pycnoscelussurinamensis* were 22 cockroaches- 24.4%, 3) *Blattellagermanica* were 20 cockroaches -22.2% 4) *Thereapetiveriana* were 18 cockroaches -20% and 5) *Periplanetaaustralasiae* were 5 cockroaches - 5.5%. (Table 1)

Table 1: Adult cockroach Percentage in Kolli hills of Namakkal district

SNo	Genus/species	%
1	<i>Blattaorientalis</i>	27.7
2	<i>Pycnoscelussurinamensis</i>	24.4
3	<i>Blattellagermanica</i>	22.2
4	<i>Thereapetivereana</i>	20
5	<i>Periplanetaaustralasiae</i>	5.5

1. *Blatta orientalis* (Cornwell, 1976) Oriental Cockroach

Habitat : The oriental cockroach is found both out doors and indoors habitats, under the old leaves, stones and in the black soil of moist places.

Distribution: It is distributed in Africa, Asia, and may be living in groups, they prefer a cooler environment, temperature about 20 -30 C, of damp areas, moist places.

Description

It belongs to the family Blattidae. The adult oriental cockroach is a shiny black (or) dark brown in color. The male roach is smaller than female. Male 2.6 – 2.8 cm in length, while female 3-3.25 cm in length. The male is more slender than female, the abdomen of female is broad. The male *Blattaorientalis* are winged, the female only has pads as her wings. The nymphs are wingless. It belongs to the family Blattidae. The nymphs are similar to the adults but have no wings (Mandal, 2007).

The female can produce eight capsules about 15 – 18 eggs in a safest place, where sufficient moist with food. The egg case take about two months to hatch and it takes about 1 year for the nymph develop into adult. The cockroach is fully nocturnal and avoids the light. Male has the wings till abdomen, the oriental cockroach are also called water. They prefer dark, moist areas, such as under drains, (raw spaces, beneath leaves, in moist soil, as they search of higher humidity. The life span of adult female in 10-25 weeks.

2. *Pycnoscelus surinamensis*– Surinam cockroach (Linnaeus, 1758).

Habitat:

Pycnoscelus surinamensis is a burrowing cockroach; they are living under the decayed leaf litters of highly moist places of loose soil, humus, under the rotten branches).

Distribution:

It is distributed tropical and sub-tropical regions of the world, and it is a common plant pest. (Cosmopolitan in distribution).

Description:

It belongs to the family Blaberide (Linnaeus, 1758). Adults are 20-25 mm in length, and have dark black

bodies with shiny brown wings with well-developed venation. Most of the species are females, while male are rarely produced. Male has longer wings than female, but the wings are functionless. The nymph me wingless, dark brown with shiny in color produced by parthenogenesis/Asexually and reproduce by the lytokous is a type of parthenogenesis in which the nymph due almost exclusively females only.

Sometimes population will be very high under the decayed leaf litter, in the moist places.

3. *Blattella germanica*, Linnaeus 1767 German cockroach

The German cockroach *Blattellagermanica* belongs to the family Blattellidae.

Habitat :

It is a world- wide distribution of tropical, subtropical region of the warm and moist areas of the world.

Distribution:

It is found throughout the world of many human settlements, such as hotels, restaurants, nursing homes, and in the leaf litter of forest areas. The population is large in the moist decayed garbage's.

Description:

It is a small species, measuring about $\frac{1}{2}$ to $\frac{3}{4}$ inch in length (1.3 to 1.6 cm), and it is a pale white brown in color. It has two distinct dark parallel stripes entering from head to the base of the wings bars on the pronotum. Both sexes have fully developed wings as long as the body. The female cockroach produces a small pink color ootheca. The female cockroach carrier the egg case attached with her abdomen for few hours before the egg hatch. It's both is a fast flying cockroach, when disturb them. The german cockroach reproduces faster than other cockroach, by sexual method. It may take about 125 days to mature adult. A egg case contains about 30 to 40 eggs. The eggs case is tiny, brown, purse shaped about 8mm long, 3mm high and 2mm wide. The male body is thin, slender and the abdomen is tapered. The female body is stout, and the abdomen is rounded. The food is scraps, pet food and other organic matters (Mandal, et al ., 2000).

4. *Therea petivereana* (Linnaeus, 1758) .Desert cockroach or seven spotted cockroach

Habitat:

They are found on the grouped in sub forest habitats, they may burrow under leaf litter (or) loose ground during summer day.

Distribution

Mostly found in Southern India, and more in Tamil Nadu, Karnataka, Andhra Pradesh etc.,

Description

It belongs to the family polyphagidae .The body is black in colour, with seven whit spots on the tegmina (dorsal side). The wings are well developed in both sexes; the head is bent back and the Ocelli (eyes face forward). Once a female has mated with a male, she does not allow other males to approach her, kicking them away with her hind wings. The eggs are laid in moist places of leaf litter, a single female can produce about 12-13 ootheca over 3-40 days.

5. *Periplaneta australasiae* Fabricius, 1775- Australian Cockroach

Habitat:

The *Periplaneta australasiae* is a tropical cockroach, found under the stone spaces, decayed leaf litters.

Distribution:

It belongs to the family Blattidae .It is a cosmopolitan distribution, it can be found in many tropical regions of world.

Description:

It is brown (or) red in colour, the adult in about 25-35 millimeters length. The tegmina have a lateral pale yellow stripe (or) lines on the eighth side of the body from head to tail. It is similar to American cockroach but, yellow lines are present in *Periplaneta austrasina* cockroach (but smaller than the American cockroach).

The young one are wingless, the adult are winged and the pronotum has a sharp and shiny yellow margin. It has wings sometimes used for flying. It prefer warmer climates, and living under the stones, barks of decayed woods. It also can tolerate dry condition as long as water is insufficient, it can travel quickly, when someone disturb them. It feed on a wide variety of organic decayed matter. It is also a scavenger of the

environment. It takes about 4-5 month to reach the adult cockroach.

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Discussion

As shown here, cockroaches play an important role in degrading plant materials in forest ecosystem (David, and Ananthkrishnan, 2004). When compared to the species diversity in the world, India has 3.8% cockroach taxa and Tamil Nadu has 30% of the Indian cockroaches. In this study, the report shows that 5 species of cockroaches belongs to four families 1) Blattidae 2) Blatellidae 3) Blaberidae and 4) Polyphagidaewere identified from Eastern Ghats of kolli hills.

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