



Tiger Beetles (Coleoptera : Cicindelidae) along Riverine Habitat in Mizoram, North East India

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Abstract

Tiger Beetles (Coleoptera : Cicindelidae) are fascinating, colourful insects with shining of various shades, carnivorous in habits, differentiated from other beetles in having prominent eyes on head and head and eyes are larger than pronotum. Mandibles are large and sickle shaped. No mention of Tiger Beetles has been made in Fauna of Mizoram, 2007, published by Zoological Survey of India, Calcutta. This paper highlights, first ever studies on tiger beetles on riverine habitat, documents, total 10 species of Tiger Beetles of sub family Cicindelinae, based on systematic surveys conducted, from June 2009 to May 2012, along riverine habitat, at Champhai District of Mizoram, North East India for the first time.

Keywords: Tiger beetles, riverine habitat, mizoram, North East India.

Introduction

Mizoram state is one of the North Eastern Hill states of India, lies between 21°58'-24°30'N latitude and 92°16'-93°25'E longitude, with an area of 21,081 sq. km. having rich biodiversity. Mizoram state is politically divided into eight districts, Champhai district is one of them located east side. Champhai district has an area of about 3185 sq km located between 23° to 24°05' N latitude and 93° to 93°26'E longitude, situated east of Mizoram state, bordering with Myanmar. It is connected to capital Aizawl with only road communication, and is the only way of its connection with Mizoram / India. Tiger Beetles have been studied well in details¹⁻¹⁴ in many other parts of India / world.

Rich faunal bio resources of the area, specially Tiger Beetle (Coleoptera : Cicindelidae) fauna of the study area has not been studied so far. No mention of Tiger Beetles of Mizoram has been made in fauna of mizoram, 2007, published by Zoological Survey of India, Calcutta. Therefore attempt has been made to conduct first ever studies on Tiger Beetles (Coleoptera : Cicindelidae) along riverine habitat of river Tuipui (Khawzawl – Champhai) and river Tiau (Indi – Myanmar border), in Mizoram, with special reference to Champhai District of Mizoram, North East India (figure-1). This paper highlights, first ever studies on tiger beetles, documents, total 10 species of sub families Cicindelinae, based on systematic surveys conducted, from June 2009 to May 2012, in approachable unprotected areas along river Tuipui, at Champhai to Khawzawl and river Tiau, along Indo-Myanmar border, at Champhai District of Mizoram, North East India for the first time.

Methodology

Study area: Surveys were conducted in approachable unprotected areas along river Tuipui, at Champhai to Khawzawl and river Tiau, along Indo-Myanmar border, from June 2009 to

May 2012. Occasional encountered nearby specimens up to nearly 100 m from river bank, were also taken into considerations.

Climatic Conditions: Mean temperature of the region varies from 22°-26° C, whereas winter temperature varies from 04°-23°C approximately and summer temperature ranges from 18°-31°C approximately. Average rain fall ranges from 1600 – 2200 mm annually. Altitude of the area ranges from 500 – 2200 m above msl.

Methods and tools used: Visual encounter surveys methodology was adopted for the study, which is the only feasible and appropriate method of surveys in this hilly region. Tiger Beetles are found to be most easily sampled by walking. Active searches were made along approachable areas of river Tuipui and river Tiau. Tiger Beetles were caught using insect net and preserved dry for further identification. Identification was done with the help of literature available¹⁵ and other Tiger Beetles experts of the world.

Results and Discussion

This paper highlights, first ever studies on tiger beetles on riverine habitat, documents, total 10 species of Sub family Cicindelinae includes twelve species namely *Cylindera viridilabris*, *Cylindera subtilesignata*, *Cylindera delavayi*, *Cicindela vittigera*, *Calomera chloris*, *Calomera funerea*, *Calochroa tritoma*, *Calochroa flavomaculata*, *Heptodonta pulchella* and *Jansenia chloropleura*, (figure - 2) based on systematic surveys conducted, from June 2009 to May 2012, along riverine sandy areas, at Champhai District of Mizoram, North East India for the first time.

family: Cicindelidae, Sub family : Cicindelinae.

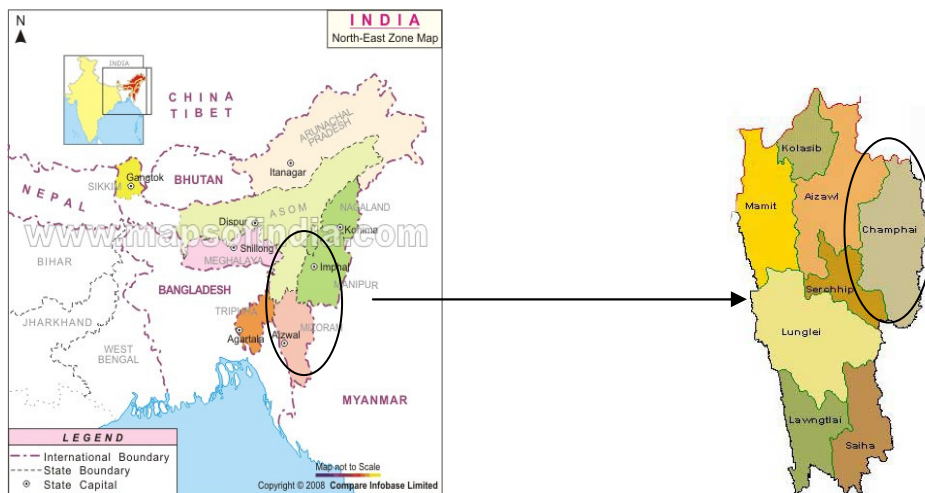


Figure-1
 Map of India, North East India, Mizoram, and Champhai District, the study area

Cylindera viridilabris: Material Examined: Small species, labrum metallic greenish, mandible dark with upper side of the base white, head shining bronze green; Pronotum shining bronze green, brighter at base; Elytra parallel sided, shoulders quite square, on each side there are four spots, one very small in the middle at the first quarter, the second lateral slightly transverse and triangular in the middle of the margin, and the third lower rounded not far from the suture and the fourth oval near margin; Legs shining coppery with greenish tarsi.

Cylindera subtilesignata: Material Examined: Head green blue, dirty golden, finely striated longitudinally between eyes, antenna with four basal segments greenish black, rest pachy; Pronotum coppery with green margins slightly narrow towards base; Elytra slightly widened behind base, each elytron is coppery with green strip extending marginally from shoulders to basal one fourth and then sub marginally up to basal three fourth, markings whitish; Legs are blue green, and dull reddish.

Cylindera delavayi: Material Examined: Small species, labrum metallic greenish brown, mandible dark with upper side of the base white, head shining bronze brown; Pronotum larger than broad, shining bronze brown green, brighter at base; Elytra parallel sided, shoulders quite square, two transverse broad comma shaped marks on each elytra dividing whole elytra into almost equal three parts, elytra slightly darker than pronotum; Legs shining coppery brown, with darker tarsi.

Cicindela vittigera: Material Examined: Head and pronotum coppery greenish, pronotum longer than wide with straight margins, elytra dark greenish gray, with a long yellow patch on each side extending from shoulder to the middle, another long curved patch extending from middle to nearly apex. There are two short linear patches close to scutellum, one after other and a curved patch on apex of elytra. Legs are metallic green, tarsi almost brown in colour.

Calomera chloris: Material Examined: Head green and coppery in the centre, broad slightly in the middle of the eyes, surface is finely striated, antenna green at four to five basal segments rest copper black; Pronotum green with green blue sides; Elytron foliage green to dull green, much broader than pronotum, two white spots joined with fine white line at the base second half of each elytron, and behind a comma shaped spot of similar size. Legs metallic green.

Calomera funerea: Material Examined: Head coppery brown in the centre, broad slightly in the middle of the eyes, surface is finely striated, antenna brown at four to five basal segments, rest coppery brown, pubescence of the pronotum less projecting at sides; elytrum brown much broader than pronotum, two white spots joined with white line at the base second half of each elytron, and behind a comma shaped spot of similar size, is there; Legs metallic brown.

Calochroa tritoma: Material Examined: Head metallic green, clypeus and front bright green, sides of the head coppery green, labrum dark, head plainly striated between eyes; Pronotum as broad as long, slightly narrowed behind, fairly sculptured sides of the pronotum coppery green; Elytra parallel sided, colour dark green brown, with a yellow spot at the shoulder and joining this yellow crescent shaped or wavy longitudinal strip dilated behind and reaching nearly to middle, followed by two spots, one just behind the middle and one at apex; Legs metallic, trochanters bright red.

Calochroa flavomaculata: Material Examined: Head and pronotum with metallic brown, blue to green at base; Pronotum as broad as long; Elytron with the sides somewhat rounded, velvety with the sides and suture narrowly bright green or blue with three yellowish white spots on each sides of about same size arranged in a line parallel; Leg femora are metallic green to violet, underside bright green.

Heptodonta pulchella: Material Examined: Head is large and is of brown coloured, striated between the eyes, lateral margins are metallic blue green, antenna is long with metallic brown base whereas rest are dull brown, labrum with seven teeth; Pronotum is dull brown red in colour, longer than wide with rounded sides, without setae, margins are brown green with coppery tinge; Elytra are uniformly pitted dull brown in colour, with margins brown green in colour, no markings or spot on elytra; Legs are thickly setose with brown and brick red in colour, tarsi ends with two claws.

Jansenia chloropleura: Material Examined: Head coppery green, green laterally behind the eyes, antenna with first four basal segments black with greenish shade; Pronotum bright coppery green and blue laterally, rounded at base; Elytra are dull coppery red with brilliant blue green margins and suture, with two white spots on each elytra at the centre of posterior half; Legs are metallic brownish green. (specimen image lost).

Table-1

Tiger beetle (Coleoptera : Cicindelidae) fauna observed along riverine habitat, at Champhai district of Mizoram, North East India

Sub family Cicindelinae Species	Habitats observed
<i>Cylindera viridilabris</i>	Riverine sandy areas, Forests paths, Agriculture fields, Road sides
<i>Cylindera subtilesignata</i>	Riverine sandy areas, Agriculture fields.
<i>Cylindera delavayi</i>	Riverine sandy areas, Forests paths, Agriculture fields, Road sides,
<i>Cicindela vittigera</i>	Riverine sandy areas, Agriculture fields.
<i>Calomera chloris</i>	Riverine sandy areas
<i>Calomera funerea</i>	Riverine sandy areas
<i>Calochroa tritoma</i>	Riverine sandy areas
<i>Calochroa flavomaculata</i>	Riverine sandy areas
<i>Heptodonta pulchella</i>	Riverine sandy areas, Forests paths, Agriculture fields, Road sides,
<i>Jansenia chloropleura</i>	Riverine sandy areas

Table-2

Composition of Tiger Beetles along Riverine habitat at Champhai district of Mizoram, North East India

Sl.No.	Genera	No of species	%
1	<i>Cylindera</i>	3	30
2	<i>Calomera</i>	2	20
3	<i>Calochroa</i>	2	20
4	<i>Cicindela</i>	1	10
5	<i>Heptodonta</i>	1	10
6	<i>Jansenia</i>	1	10
	Total	10	--

Conclusion

Tiger Beetles are carnivorous Beetles; feed on small insects and other arthropods. These Beetles can be managed and conserved systematically and scientifically in the area of the occurrence, could be useful in pest control of agriculture and forests significance, without any health hazards. Systematic surveys were conducted along the riverine habitats (figure – 3) at Champhai district of Mizoram state, North East India. Total 10 species of 6 genera *Cylindera*, *Calomera*, *Calochroa*, *Cicindela*, *Heptodonta* and *Jansenia* have been observed. The observed species are *Cylindera viridilabris*, *Cylindera subtilesignata*, *Cylindera delavayi*, *Cicindela vittigera*, *Calomera chloris*, *Calomera funerea*, *Calochroa tritoma*, *Calochroa flavomaculata*, *Heptodonta pulchella*, *Jansenia chloropleura* (table – 1 and 2). *Cylindera* constitute 30%, *Calomera* and *Calochroa* constitute 20% each, *Cicindela*, *Heptodonta* and *Jansenia* constitute 10% each, of the total Tiger Beetle fauna observed (table -2). *Cylindera viridilabris*, *Cylindera subtilesignata*, *Cylindera delavayi*, *Cicindela vittigera* and *Heptodonta pulchella* have wide distribution range like Riverine sandy area, Forests paths, Agriculture fields and Road sides, where as *Calomera chloris*, *Calomera funerea*, *Calochroa tritoma*, *Calochroa flavomaculata* and *Jansenia pulchella* has narrow distribution range, exclusively found near river side, and have not been observed other habitats.

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References

- Uniyal V.P. and Bhargav V., Tiger Beetles – A field study in the Shivaliks of Himachal Pradesh, Wildlife Institute of India, Dehradun (2007)
- Bhargav V.K. and Uniyal V.P., Communal roosting of Tiger Beetles (Coleoptera : Cicindelidae) in the shivalik hills of Himachal Pradesh, India, *Cicindela*, 40(1-2), 1-22 (2008)
- Pajni H.R. and Bedi S.S., Preliminary survey of the cicindelid fauna of Chandigarh, Punjab, India, *Cicindela*, 5, 41-56 (1973)
- Pajni H.R., Kumar A. and Pearson D.L., Corrections and additions to the Tiger Beetle fauna (Coleoptera : Cicindelidae) of Chandigarh area of North Western India, *Cicindela*, 16(3/4), 21, (1984)

5. Pearson D.L. and Anderson J.J., Perching heights and nocturnal communal roosts of some Tiger Beetles (Coleoptera : Cicindelidae) in southern Peru, *Biotropica*, **17**, 126-129 (1985)
6. Pearson D.L. and Ghorpade K., Tiger Beetles (Coleoptera : Cicindelidae) of the Siliguri-Darjeeling area in India, *Colemania*, **4**, 1-22 (1987)
7. Pearson D.L. and Ghorpade K., Geographical distribution and ecological history of Tiger Beetles (Coleoptera : Cicindelidae) of Indian subcontinent, *Journal of Biogeography*, **16**, 333-344 (1989)
8. Singh N., Taxonomic studies on some Indian Cicindelidae with special reference to external genitalia (Coleoptera : Insecta), D. Phil. Thesis. Faculty of Science, Punjab University, Chandigarh, (1991)
9. Pearson D.L. and Cassola F., Worldwide species richness patterns of Tiger Beetles (Coleoptera: Cicindelidae): indicator taxon for biodiversity and conservation studies, *Conservation Biology*, **6**(3), 376-391 (1992)
10. Carrol S.S. and Pearson D.L., Spatial Modeling of Butterfly species richness using Tiger Beetles (Cicindelidae) as a bio-indicator taxon, *Ecological Application*, **8**(2), 531-543 (1998)
11. Sawada Hirofumi and Jurgen Wiesner, Records of Tiger Beetles collected in North India (Coleoptera : Cicindelidae), *Ent. Res. Japan.*, **54**(2), 189-195 (1999)
12. Uniyal V.P. and Mathur P.K., Altitudinal distribution of Tiger Beetles (Coleoptera : Cicindelidae) in great Himalayan National Conservation Park area, Western Himalaya, *The Indian Forester*, **126**(10), 1141-1143 (2000)
13. Sinu P.A., Nasser M. and Rajan P.D., Feeding fauna and foraging habits of Tiger Beetles found in agro-ecosystems in Western Ghats, *Biotropica*, **38**, 500-507 (2006)
14. Tigreros, Natasha and Kattan G H., Mating behaviour in two sympatric species of Anden Tiger Beetles (Cicindelidae), *Boletin del Museo de Entomologica de la Universided del velle*. **9**(1):22-28. (2008)
15. Fowler W.W., The Fauna of British India including Ceylon and Burma. Coleoptera – General Introduction and Cicindelidae and Paussidae, Today and Tomorrow's Printers and Publishers, New Delhi, (1912)



Cylindera viridilabris



Cylindera subtile signata



Cylindera delavayi



Cicindela vittigera



Calomera chloris



Calomera funerea



Calochroa tritoma



Calochroa flavomaculata



Heptodonta pulchella



Figure - 2



Figure - 3
Riverine habitat of Tiger Beetles