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**Research Article**

# STUDY OF SUBFAMILY ASOPINAE (PENTATOMMIDAE: HETEROPTERA) FROM DUMNA NATURE PARK, JABALPUR, MADHYA PRADESH

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## ABSTRACT

Five species of subfamily Asopinae (Pentatommidae: Heteroptera) are reported from Dumna Nature Park. The species are *Zicrona caerulea, Niphe rubferruginea, Eysarcoris montivagus, Perillus bioculatus* and *Cresphontes monsoni.* All the five species are reported first time from the Park.

**Keywords:** Asopinae, Sinuate, Rostrum, Fuscescent, Pronptum, Dumna Nature Park.

## INTRODUCTION

The Pentatomidae is one of the largest families within the suborder Heteroptera. There are about 36,096 described species of Heteroptera of which 4,123 species belong to the family Pentatomidae. Within this family, there are eight subfamilies: Asopinae, Podopinae, Cyrtocorinae, Discocephalinae, Phyllocephalinae, Edessinae, Pentatominae, and Serbaninae (Schuh and Slater, 1995). Members of the subfamily Asopinae is commonly called as soldier bugs or predatory stink bugs. Predaceous nature of Asopinae is the main feature which set apart this subfamily from other pentatomid subfamilies (Claver and Jaiswal, 2013). They are generalist predators, feeding on insects belonging to different orders. These natural enemies play an important role to the population balance of phytophagous insects, permitting reduced use of pesticides in planted forests, agricultural systems and consequently the conservation of the ecosphere and environment (Vacari *et al.* 2007; De bortoli *et al.*, 2011).

The state of Madhya Pradesh is located in the center of India and lies between 210 to 250 N and longitudes 740 to 840 E. Jabalpur district lies in the Eastern half of Madhya Pradesh. Geographically it lies between $23^0$ $10^{'}$ North latitude and $79^0$ $59^{'}$ East longitude with a total geographic area of 5211 sq. km. Dumna Nature Park (DNP) is located ($23^0$ $10^{'}$ North latitude and $80^0$ $1^{'}$ East longitude) on Dumna Airport Road in district Jabalpur. The Park has an area of 1058 ha is a mixed forest under Jabalpur Municipal Corporation managed by the Department of Forestry, government of Madhya Pradesh. The DNP has not been explored, only few species of Hymenoptera and Hemiptera has been reported so far (Sheikh *et al*., 2016abcd; Sheikh *et al*., 2017abcd). The present study deals with the subfamily Asopinae of order Hemiptera.

## METHODOLOGY

The Asopinae fauna from DNP was collected through two sampling methods viz. sweep net and light trap.

### Sweep Net

Sweep net made up of 11 inch diameter circular iron frame attached to an aluminum handle of 30 inches long and 2.5 inch diameter with a hanging conical net bag of 28 inch length attached to the circular frame, was used to collect the Asopinae fauna of Dumna Nature Park.

### Light Trap

A funnel shaped light trap was installed during 2014 in the middle of the forest, equidistant to all the four sampling sites. The trap consisted of a mercury bulb hanging beneath the roof into the funnel. The tin funnel has a diameter of 18 inches at the end-facing bulb and a diameter of 3 inches at

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the other end, which receives a box. Bulb operated though main supply indirectly with the help of choke. The trap was erected on the iron stand. The insects attracted to the light, hover around the bulb and eventually fall into the funnel. Insects fell down into the box and eventually killed by the killing agent.

## RESULTS

Five species namely *Z. caerulea, N. rubferruginea, E. montivagus, P. bioculatus* and *C. monsoni* were recorded from the DNP. All the five species are reported for the first time from the Park. The systematic list and Systematic account is given.

**Systematic list**

Order : Hemiptera
Suborder : Heteroptera
Superfamily : Pentatomoidea
Family : Pentatommidae
Subfamily : Asopinae
Genus : *Zicrona* Amy. and Serv., 1834
1. Species : *Zicrona caerulea* Linneus, 1758
Genus : *Niphe* Stal, 1867
2. Species : *Niphe rubferruginea* Westwood, 1837
Genus : *Eysarcoris* Hahn, 1834
3. Species : *Eysarcoris montivagus* Distant, 1902
Genus : *Perillus* Stal, 1862
4. Species : *Perillus bioculatus* Fabricius, 1775
Genus : Cresphontes Stall, 1876
**5.** Species : *Cresphontes monsoni* Westwood, 1837

## Systematic account

### Genus: *Zicrona* Amy and Serv., 1834

**Diagnostic characters:** Lateral lobes of the head not or very slightly longer than the central lobe; second joint of antennae longer than the third; rostrum with the second joint longest, but shorter than the two apical joints taken together; pronotum with the lateral margins entire or very obsoletely eroded; abdomen unarmed at base anterior tibiae not dilated.

### 1. *Zicrona caerulea* Linneus, 1758

1758. *Cimex caerulea* Linnacus, *Syst. nat. ed.* 10: 445.

1985. *Zicrono caerulea* (Linneus), Dalla, Ghosh and Dhar, *Rec. zool. surv.lndia* Occ. paper no. 80: 10.

**Diagnostic characters:** Lateral lobes of head slightly longer than central lobe; body entirely blue or violaceous; antennae black, second joint of antennae longer than the third; scutellum little gibbous at base; pronotum with the lateral margins entire or very obsoletely eroded; rostrum with the second joint longest, but shorter than the two apical joints taken together; above very finely and somewhat sparingly punctate; membrane black; above very finely punctate; abdomen unarmed at base; anterior tibiae not dilated. Length: 9 mm (Figure 1A).

*Material examined*: India: Madhya Pradesh, Jabalpur district, Dumna Nature Park, 16.v.2015, Coll. Altaf Hussain Sheikh.

**Distribution:** India: Jammu and Kashmir, Madhya Pradesh and West Bengal; Elsewhere: Burma, China and Japan (ZSI, 2011).

### Genus: *Niphe* Stal, 1867

**Diagnostic characters:** Head a little narrowed forwards, the lateral lobes very slightly longer than the central lobe; rostrum extending to the posterior coxae; antennae slender, first joint almost reaching apex of head; pronotum with the anterior margin broadly sinuate, but truncate behind the eyes; scutellum much longer than broad, its apex prominently narrowed.

### 2. *Niphe subferruginea* Westwood, 1837

1837. *Pentatoma subferruginea* Westwood, *In Hope Cat*., 1: 35.

1902. *Niphe subferruginea* (Westwood), Distant, *Fauna Brit. India, Rhynchota*, 1:151.

**Diagnostic characters:** Head a little narrowed forwards; antennae testaceous; body reddish brown, thickly and darkly punctate; lateral margins of the pronotum, basal lateral margins of corium, apex of scutellum, connexivum, body beneath, and legs brown; sternum coarsely but palely punctate and with about two small black spots on the lateral areas of each segment; lateral areas of abdomen with scattered small spots and the stigmata black. Length: 13 mm (Figure 1B).

**Material examined:** India: Madhya Pradesh, Jabalpur district, Dumna Nature Park, 13.x.2015, Coll. Altaf Hussain Sheikh.

**Distribution:** India: Chhattisgarh, Kerala, Maharashtra and Meghalaya; Elsewhere: Myanmar (Chandra and Kushwaha, 2012).

### Genus: *Eysarcoris* Hahn, 1834

**Diagnostic characters:** Head deflected, its apex rounded, the central lobe either as long as lateral lobes or slightly prominent; antennae with the basal joint not reaching or nearly reaching the apex of head; pronotum anteriorly deflected; scutellum about as long as its breadth at base or a little longer.

### 3. *Eysarcoris montivagus* Distant, 1902

1902. *Eysarcocoris montivagus* Distant, *Fauna Brit. India, Rhynchota*, 1: 166.

1999. *Eysarcocoris montivagus* Distant, Chakraborty and Ghosh, *Fauna of Meghalaya: State Fauna Series* no., 4: 402.

**Diagnostic characters:** Head less broader than body; body moderately broad and somewhat strongly convex beneath; pronotal angles less produced; scutellum narrower and more laterally sinuate; lateral margin of scutellum brassy black; abdomen beneath with a central brassy black angulate fascia. Length: 5 mm (Figure 1C).

**Material examined:** India: Madhya Pradesh, Jabalpur district, Dumna Nature Park, 10.x.2014, Coll. Altaf Hussain Sheikh.

**Distribution:** India: Assam, Chhattisgarh, Madhya Pradesh, Meghalaya, Nagaland, Sikkim and Uttar Pradesh; Elsewhere: Burma (Chandra and Kushwaha, 2012).

## Genus: *Perillus* Stal, 1862

**Diagnostic characters:** Anterior pronotal area with two centrally broken broad transverse black punctate callosities; scutelum reddish except medial Y-shaped black fascia not reaching extreme ends, lateral margins of scutellum, clavus and corium black and finely punctured; spiracles black; legs black and pubescent; paraclypeus and clypeus equal in length; connexiva exposed at repose dorsally, not ventrally.

### 4. *Perillus bioculatus* Fabricius, 1775

1775. *Cimex bioculatus* Fabricius, *Syst. Ent*., 715.

1825. *Pentatoma clanda* Say, *J. Acad. Nat. Sci. Phila.,* 4: 312.

1876. *Perillus claudus* (sic) Uhler, *Bull. Geol. and Geogr. Surv. Terr.,* 1: 281.

1862. *Oplomus virgatus* Stål, *Stett. Entomol. Zeit.,* 23: 89.

1872. *Perillus bioculatus* Stal, *Kongl. Svensk. Veten.-Akad. Handl.,* 10: 129.

1886. *Mineus bioculatus* Uhler, *Brooklyn Entomol. Soc.* New York, 4.

1907b . *Perriloides bioculatus,* Schouteden, *Genera Insectorum Fasc.,* 52: 37.

1912. *Perillus bioculatus* var. *claudus* Caesar, *Annu. Rpt. Entomol. Soc. Ontario.,* 42: 33.

*Perillus bioculatus*: Knight (1952), *Ann. Entomol. Soc. Am.,* 45: 229.

**Diagnostic characters:** Head broader than long, rugulose with irregular callosities, rectilinear at apex; area just before and posterior end of head impunctate; antennae black; eyes dark brownish; ocelli dark red; pronotum sparingly punctate, bicolourous with anterior three-fourth portion reddish, rest black; anterior pronotal area with two centrally broken broad transverse black punctate callosities; anterior most area of costal margin reddish, rest black; membrane black; connexiva with lateral margins and last segment impunctate and reddish, inner margins black and punctuate; scutelum reddish except medial Y-shaped black fascia not reaching extreme ends, lateral margins of scutellum, clavus and corium black and finely punctured. Pleural margins reddish, except ventroposterior area of prosternum with incomplete brownish yellow transverse fascia reaching just half way towards pleural margin; abdominal tubercle reddish; abdomen reddish with broad continuous fascia on entire fifth, sixth and anterior half of seventhth abdominal segments; humeral angles subprominent, obtusely angulated. Length: 10 – 14 mm (Figure 1D).

**Material examined:** India: Madhya Pradesh, Jabalpur district, Dumna Nature Park, 18.x .2015, Coll. Altaf Hussain Sheikh.

**Distribution:** India: Andhra Pradesh, Chhattisgarh, Himachal Pradesh, Karnataka, Maharashtra and Tamil Nadu; Elsewhere: Srilanka (ZSI, 2011).

## Genus: Cresphontes Stall, 1876

**Diagnostic characters:** Head moderately narrowed forwardly; rostrum extending to the posterior coxae; antennae moderate, first joint not quite reaching the apex of head, second shorter than third; scutellum somewhat broad at apex, moderately long, frena extending a little beyond its middle; apical margin of coriurn rounded; abdomen armed at base.

### 5. *Cresphontes monsoni*, Westwood, 1837

*1837. Cresphontes monsoni* Westwood, (*Rhaphigaster*) *in Hope Cat. 1:31*

*1900. Cresphontes nifescens* Bredd, *Deutsche ent. Zeitschr., 163.*

*Material examined*: India: Madhya Pradesh, Jabalpur district, Dumna Nature Park, 12.ix.2015, Coll. Altaf Hussain Sheikh.

**Diagnostic characters:** Head punctured; body pale flavescent or stramineous, blackly punctate, the punctures on pronotum arranged in patches, margins and apex of scutellum densely punctate; corium somewhat rufescent, densely punctate; wings fuscescent; basal angle of membrane with an obscure spot; membrane fuscescent; abdomen above, first and second joints of antennae, bases of remaining joints, connexivum and legs more or less rufescent; a somewhat smooth median shining spot on scutellum and some minute spots on sternum and abdomen; duplicated spots on connexivum, also spots on the apices of the femora, black. Length: 11 mm (Figure 1E).

**Material examined:** India: Madhya Pradesh, Jabalpur district, Dumna Nature Park, 13.x .2015, Coll. Altaf Hussain Sheikh.

**Distribution:** Andra Pradesh and West Bengal; Elsewhere: Pakistan (Chandra and Kushwaha, 2012).

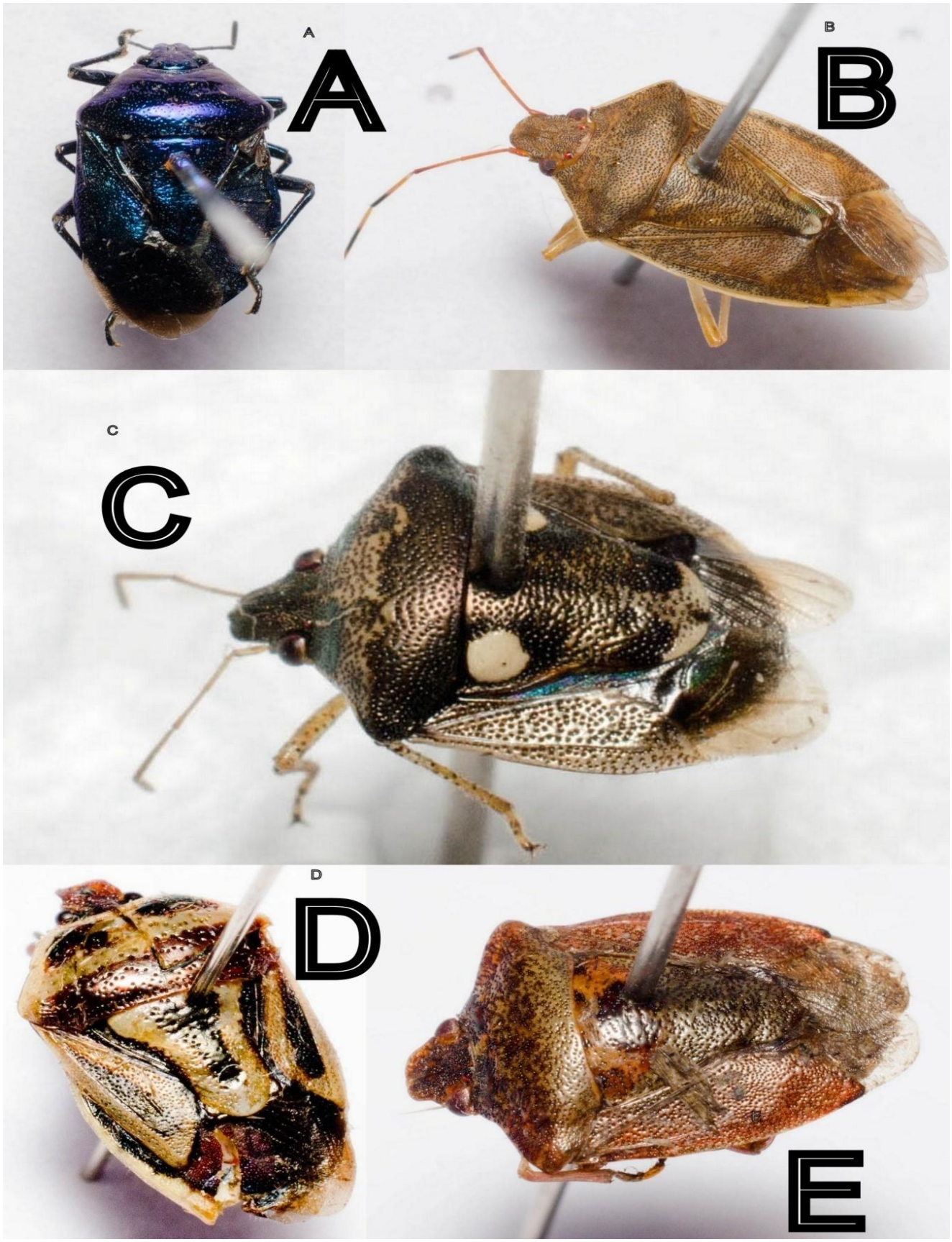


**Figure 1.** A. *Zicrona caerulea.* B. *Niphe rubferruginea.* C. *Eysarcoris montivagus.* D. *Perillus bioculatus.* E. *Cresphontes monsoni.*

## CONCLUSION

The bugs belonging to subfamily Asopinae are polyphagous predators of insect larvae and are distributed in tropical and warm temperate zones worldwide. Due their predaceous nature, they can be utilized as bio-control measure agaist insect pests. Five species viz. *Z. caerulea*, *N. rubferruginea*, *E. montivagus*, *P. bioculatus* and *C. monsoni* belonging to five genera of subfamily Asopinae were recorded from the DNP during the two year study. All the five species are reported first time from the Park.

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