

A REVIEW OF THE GENUS *BAGAUDA* BERGROTH, 1903 (HETEROPTERA: REDUVIIDAE) FROM INDIA

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ABSTRACT: The paper presents a revision of the genus *Bagauda* Bergroth, 1903 from India. Key to the species of the genus and distributions of each species in India and abroad have been included.

KEY WORDS: Heteroptera, Reduviidae, *Bagauda*, revision, India

Bergroth (1903) erected the genus *Bagauda* (Heteroptera: Reduviidae) based on the type species *Bagauda avidus* Bergroth, 1903, belonging to the subfamily Emesinae of the family Reduviidae. The family Reduviidae, commonly known as "Assassin bugs" are the largest group of predaceous terrestrial Hemiptera, comprising of 6878 species and subspecies under 981 genera belonging to 25 subfamilies (Henry, 2009) from the world. Of which 465 species under 144 genera belonging to 14 subfamilies (Biswas & Mitra, 2011) are recorded from India. The subfamily Emesinae is represented by 28 species and 14 genera under four tribes, viz., Emesini, Leistarchini, Metapterini and Ploiariolini. The group was monographed by Wygodzinsky, 1966, who recognized six tribes Collartidini, Leistarchini, Emesini, Ploiariini, Deliastrini and Metapterini, comprising 86 genera, out of which 20 are monotypic and known from a single locality. Distant (1906) erected a new species viz. *Bagauda splendens* from Sri Lanka. Later on, Chandra et al. (2015) has recorded this species from Chhindwara District of Madhya Pradesh, India. Paiva (1919) added another new species viz. *Bagauda cavernicola* from Assam. Wygodzinsky (1966) in his monograph of Emesinae added a new species viz. *Bagauda similis* from West Bengal. Till to date four species under the genus *Bagauda* Bergroth has been so far known from India. In this paper the genus *Bagauda* Bergroth is reviewed with a new distributional record of *Bagauda avidus* Bergroth from Madhya Pradesh, key to the species of the genus *Bagauda* Bergroth and distributions of each species in India and abroad is also included.

MATERIALS AND METHODS

This study is based on 14 specimens present in Hemiptera Section, Zoological Survey of India, Kolkata, collected from various localities of Indian subcontinent. The specimens were studied and photographed by using a Leica Stereo microscope M 205A. The specimens are deposited in the National Zoological Collection of Zoological Survey of India, Hemiptera Section, Kolkata. All measurements are in millimetres.

RESULTS AND DISCUSSION

Genus *Bagauda* Bergroth, 1903

1903. *Bagauda* Bergroth, Rev. d'Ent., 22: 12.

Diagnosis: Macropterous; head fusiform, anteocular and postocular moderately elevated, postocular region rounded, interocular furrow not extending behind level of posterior border of eyes; eyes medium sized; rostrum slender, straight, first segment reaching middle of anteocular region of head, second subequal to first, third as long as or longer than first or second; antennae inserted nearer to apex of head than anterior border of eyes, first segment three times longer than pronotum; pronotum more than twice the length of head, base considerably wider than apex, medially constricted, basal margin sinuate, completely covering mesonotum, scutellum exposed, anterior lobe subcylindrical, narrowed posteriorly whereas posterior lobe subrectangular with sides diverging posteriorly; scutellum subtriangular; hemelytra passing abdominal apex, exterior cell of membrane longer than interior cell; forelegs stout, fore femora moderately incrassated, beneath finely spinose, fore tibia and tarsi united about as long as femora, fore tarsi single-jointed, hind femora invariably passing abdominal apex.

Key to the species of the genus *Bagauda* Bergroth

1. Length 14-16 mm.....*cavernicola* Paiva
- Length 10-13 mm.....2
2. Forelegs and forewings with contrasting light and dark colour pattern.....3
- Forelegs and forewings rather uniformly brownish, lacking conspicuously contrasting pattern elements.....*avidus* Bergroth
3. Fore lobe of pronotum longer than hind lobe; forelegs dark, femur with a subapical stramineous, incomplete annulus; anterior two-thirds and posterior lobe of pronotum dark brown.....*similis* Wygodzinsky
- Fore lobe of pronotum about as long as hind lobe; trochanter, base of femur and apex of tibia of forelegs, yellowish; pronotum dark brown.....*splendens* Distant

Bagauda cavernicola Paiva, 1919

1919. *Bagauda cavernicola* Paiva, Rec. Indian Mus., 16: 349-377.

1966. *Bagauda cavernicola*, Wygodzinsky, Bull. Amer. Mus. Nat. Hist., 133: 95.

1990. *Bagauda cavernicola*, Maldonado, Carribbean J. Sci. (special ed.), 99 pp.

Description: Body castaneous brown in colour (Fig. 1); anterior region of fore lobe of pronotum and hind lobe dark brown, rest yellowish brown (Fig. 2); membrane fuliginous, a large round spot on corium; apex of fore, mid and hind femora and base of fore, mid and hind tibiae creamy white; head (1.47 mm) shorter than anterior lobe of pronotum (1.74 mm), anteocular region of head (0.91 mm) distinctly longer than postocular region (0.55 mm); first segment of antennae (10.53 mm) longer than second segment (9.84 mm) and exceeding the length of head and pronotum together (4.72 mm); first segment of rostrum (0.46 mm) slightly shorter than second segment (0.52 mm), third segment (0.61 mm) longer than second segment (0.52 mm) (Fig. 3); anterior lobe of pronotum (1.74 mm) slightly longer than posterior lobe (1.50 mm) and constricted area of pronotum extending to the anterior half of posterior lobe; scutellum transverse; hemelytra exceeding the length of abdomen; legs with hind tibiae (22.33 mm) 1.5

times longer than hind femora (14.58 mm), first tarsal joint slightly longer than second joint but shorter than third joint.

Measurements: (1 ♂ in mm). Body length 15.57; head length 1.47, width across eye 1.10; length of anteocular region 0.91, postocular region 0.55; length of antennae 26.37, lengths of antennal segments I: 10.53, II: 9.84, III: 4.04, and IV: 1.95; rostral length 1.701, length of rostral segments I: 0.46, II: 0.52 and III: 0.61; length of pronotum 3.25; length of anterior pronotal lobe 1.74, posterior pronotal lobe 1.50, width of anterior pronotal lobe 1.19, posterior pronotal lobe 1.76; length of fore coxa: 2.55, trochanter: 0.65, femur: 4.02, tibia: 2.23, tarsus: 1.70, claws: 0.12; mid coxa: 0.70, trochanter: 0.51, femur: 11.01, tibia: 15.27, tarsus: 0.37, claw: 0.12; hind coxa: 1.03, trochanter: 0.51, femur: 14.58, tibia: 22.33, tarsus: 0.55, claw: 0.14.

Material examined: 6exs., India: Assam: West Garo hills: Siju cave, 2.XI.1917, R. Friel; 5exs., Assam: Garo hills: Siju cave, 10.II.1922, S.K. and B.N.C.

Distribution: India: Assam. Elsewhere: Sri Lanka.

***Bagauda avidus*, Bergroth 1903**

1903. *Bagauda avidus* Berger, Rev. d' Ent., 22: 13.

1904. *Bagauda avidus* Distant, Fauna Brit. India, Rhynchota, 2: 208.

Description: Body yellowish brown in colour, opaque (Fig. 5); head oval, anteocular region (0.79 mm) longer than postocular region (0.32 mm); antennae black, first segment of antennae (4.95 mm) slightly longer than second (4.74 mm); rostrum with first segment (0.43 mm) about as long as second (0.40 mm), third (0.35 mm) little shorter than the other two (Fig. 7); pronotum with anterior lobe (1.40 mm) longer than posterior lobe (1.15 mm), posterior lobe dark brown with angles of pronotum distinctly nodulose (Fig. 6); fore femora moderately incrassated with very minute, fine and black spines and its length (3.06 mm) about as long as tibia and tarsus together (3.00 mm) (Fig. 7), hind femora dark brownish, apices of mid and hind femora and bases of mid and hind tibiae creamy white, mid and hind tibia longer than femora.

Measurements: (1 ♂ in mm). Body length 10.96; head length 1.11, width across eye 0.88; length of anteocular region 0.79, postocular region 0.32; length of antennae 12.22, lengths of antennal segments I: 4.95, II: 4.74, III: 1.80, and IV: 0.73; rostral length 1.18, length of rostral segments I: 0.43, II: 0.40 and III: 0.35; length of pronotum 2.55; length of anterior pronotal lobe 1.40, posterior pronotal lobe 1.15, width of anterior pronotal lobe 0.82, posterior pronotal lobe 1.47; length of fore coxa: 1.81, trochanter: 0.49, femur: 3.06, tibia: 1.93, tarsus: 1.07, claws: 0.12; mid coxa: 0.70, trochanter: 0.41, femur: 7.83, tibia: 9.87, tarsus: 0.36, claw: 0.12; hind coxa: 0.75, trochanter: 0.50, femur: 10.60, tibia: 12.03, tarsus: 0.40, claw: 0.13.

Material examined: 1 ex, India: Madhya Pradesh: Senoi: Simariya village: Pench Tiger Reserve, 7.VIII.2001, Coll. R.K. Singh.

Distribution: India: Maharashtra, Madhya Pradesh and Tamil Nadu. Elsewhere: Sri Lanka.

***Bagauda similis* Wygodzinsky, 1966**

1966. *Bagauda similis* Wygodzinsky, Bull. Amer. Mus. Nat. Hist., 133: 98-100.

1990. *Bagauda similis*, Maldonado, Carribbean J. Sci. (special ed.), 99 pp.

2006. *Bagauda similis*, Ambrose, Zoos' Print Journal, 21 (9): 5.

Description: Body dark brown (Fig. 9); head suboval, interocular furrow extend backwardly almost to level of posterior border of eyes; anterior two-thirds and posterior lobe of pronotum dark brown (Fig. 10); rostrum straight, first segment (0.47 mm) slightly longer than second segment (0.41 mm) which is subequal to third segment (0.47 mm) (Fig. 11); antennae bare in both sexes, length of first segment (8.90 mm) longer than rest of the segments; eyes extends beyond anteocular region of head; fore lobe of pronotum (1.67 mm) smooth, longer than posterior lobe (1.31 mm) (Fig. 10) and on posterior region with stramineous spot (occupying whole length of pronotum in male), hind lobe dilated rugose punctate with a distinct narrow, median longitudinal ridge, posterior two-thirds of fore lobe laterally with a distinct narrow carina; fore wings attaining apex of abdomen; abdomen slender; forelegs dark, fore coxae stout, as long as prothorax along ventral surface, femur with a subapical stramineous, incomplete annulus and with spine-like setae at under surface, spines of base of posteroventral series not distinctly longer or stouter than remainings, tibiae somewhat longer than half of length of femur, on ventral surface with one series of short inclined spines, tarsus half as long as tibia, third joint longer than second, their combined length slightly less than half as long as first, two subequal claws; mid and hind legs elongate, hind femora extending apex of fore wing.

Measurements: (1 ♂ in mm). Body length 12.41; head length 1.11, width across eye 1.11; length of anteocular region 0.70, postocular region 0.41; length of antennae 15.86, lengths of antennal segments I: 8.90, II: 1.68, III: 3.59, and IV: 1.60; rostral length 1.36, length of rostral segments I: 0.47, II: 0.41 and III: 0.47; length of pronotum 2.98; length of anterior pronotal lobe 1.67, posterior pronotal lobe 1.31, width of anterior pronotal lobe 0.86, posterior pronotal lobe 1.48; length of fore coxa: 1.50, trochanter: 0.56, femur: 3.85, tibia: 1.98, tarsus: 1.50, claws: 0.12; mid coxa: 0.54, trochanter: 0.43, femur: 9.95, tibia: 14.26, tarsus: 0.39, claw: 0.12; hind coxa: 0.44, trochanter: 0.40, femur: 12.34, tibia: 20.54, tarsus: 0.57, claw: 0.13.

Material examined: 1ex., India: West Bengal: Baigachi, 14.VII.1943, Biswas and party.

Distribution: India: Tamil Nadu, West Bengal.

***Bagauda splendens* Distant, 1906**

1906. *Bagauda splendens* Distant, Ann. Mag. Nat. Hist., (7) 18: 364.

1909. *Bagauda decorus* :Breddin, Ann. Soc. Ent. Belg.: 301.

1910. *Bagauda splendens* : Distant, Fauna Brit. India, Rhynchota, 5: 176.

Description: Body dark brownish black in colour (Fig. 13); head, eyes, anterior margin of pronotum, scutellum, apical area of abdomen beneath black; pronotum, membrane, anterior femora (excluding base) and anterior tibiae brown; head suboval, narrower in front of eyes (Fig. 14); rostrum with the first segment reaching middle of anteocular portion of head, second segment subequal to first, third slightly shorter than second (Fig. 15); head sub-oval, narrow in front of eyes than behind, anteocular region (0.91 mm) longer than postocular region (0.34 mm); first segment of antennae (6.61 mm) longer than second (5.15 mm); pronotum dark brown, its length (2.66 mm) more than twice as long as head (1.25 mm), the anterior lobe (1.37 mm) constricted and about as long as posterior lobe (1.30 mm), which is convex with a central longitudinal narrow ridge and with a nodule near each posterior angle, its basal margin wavy (Fig. 14); scutellum triangular; corium, chestnut brown in colour between the veins and with a pale creamy patch before the membrane, the latter with a central pale vein, lateral area

of corium transversely striate; hemelytra passing the abdominal apex (Fig. 16), exterior cells of the membrane longer than the interior; trochanter, base of femur and apex of tibia of forelegs, yellowish (Fig. 15), fore femora (2.79 mm) moderately thickened and finely spinous beneath, about as long as fore tibiae and tarsi together (2.95 mm), hind femora (10.02 mm) about as long as entire body (10.85 mm), apex of mid and hind femora and base of mid and hind tibia, creamy white; tarsi three-jointed.

Measurements: (1 ♂ in mm). Body length 10.85; head length 1.25, width across eye 0.86; length of anteocular region 0.91, postocular region 0.34; length of first antennal segment 6.61, length of second antennal segment 5.15, rest two segments are damaged; rostral length 1.29, length of rostral segments I: 0.43, II: 0.42 and III: 0.44; length of pronotum 2.66; length of anterior pronotal lobe 1.37, posterior pronotal lobe 1.30, width of anterior pronotal lobe 0.87, posterior pronotal lobe 1.55; length of fore coxa: 1.69, trochanter: 0.52, femur: 2.79, tibia: 1.80, tarsus: 1.15, claws: 0.07; mid coxa: 0.58, trochanter: 0.47, femur: 7.49, tibia: 9.58, tarsi damaged; hind coxa: 0.64, trochanter: 0.35, femur: 10.02, tibia: 14.67, tarsus: 0.34, claw: 0.12.

Material examined: 1ex, India: Madhya Pradesh: Chhindwara: near the origin of the River Gayeni (Pataalkot), 13.X.1992, Coll. R. K. Singh and party.

Distribution: India: Madhya Pradesh. Elsewhere: Sri Lanka.

SUMMARY

The genus *Bagauda* Bergroth from Indian subcontinent is reviewed, recognizing four species from the subcontinent. The species *Bagauda avidus* Bergroth is reported here for the first time from Madhya Pradesh. Measurements of different body parts were taken which can be utilised as an additional diagnostic characters. Key to the species of the genus *Bagauda* Bergroth and distributions of each species in India and abroad have been included in the present study.

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Figures 1-4. *Bagauda cavernicola* Paiva: 1. Dorsal view of male; 2. head and pronotum, dorsal view; 3. head with rostrum and forelegs, lateral view; 4. abdominal tip of male, ventral view.



Figures 5-8. *Bagauda avidus*, Bergroth: 5. Dorsal view of male; 6. head and pronotum, dorsal view; 7. head with rostrum and forelegs, lateral view; 8. abdominal tip of male, ventral view.



Figures 9-12. *Bagauda similis* Wygodzinsky: 9. Dorsal view of male; 10. head and pronotum, dorsal view; 11. head with rostrum, lateral view; 12. abdominal tip of male, ventral view.



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Figures 13-16. *Bagauda splendens* Distant: 13. Dorsal view of male; 14. head and pronotum, dorsal view; 15. head with rostrum and forelegs, lateral view; 16. abdomen, lateral view.