

SOME NEW RECORDS OF LEAFHOPPERS (CICADELLIDAE: HEMIPTERA) FROM CHHATTISGARH, INDIA

Praveen K^{1*}, B. Biswas², M. E. Hassan³, K. Chandra⁴ and S. Sabita Raja⁵

¹⁻⁴ Zoological Survey of India, M-Block, New Alipore, Kolkata-700053, India.

⁵ Department of Zoology, Osmania University, Hyderabad-500007, India.

E-mail: praveen.atgc@gmail.com

ABSTRACT

The member of the family *cicadellidae* is commonly known as leafhoppers and belongs to the order Hemiptera. In the present study 15 species are reported from the state Chhattisgarh India. 14 of them are new record to the state.

Key Words: Hemiptera, Cicadellidae, Leafhopper, Taxonomy.

INTRODUCTION

The family *Cicadellidae* belongs to the superfamily Membracoidea under the Infraorder Cicadomorpha of the suborder Auchenorrhyncha under the order Hemiptera. Cicadellids are usually known as Leafhoppers and they have been considered insects of economic importance. They are common seasonal insects of rice fields in India including Chhattisgarh. Cicadellids cause considerable damage by sucking the sap as well as by transmitting different viral diseases to the infected plant and therefore these insects are considered as one of the most economically important insects from agricultural point of view.

The Indian Cicadellidae are known through the works of Fabricius (1794), followed by Atkinson (1885), W.L. Distant (1908, 1916 & 1918), Pruthi (1930-40), Sohi (1972), Ramakrishna and Menon (1971-1974), Rao (1967, 1969, 1974), Datta & Ghosh (1973) and voluminous contribution of Viraktamath (since 1973) on the Indian leafhopper has given new dimension to this group.

As far as state Chhattisgarh is concerned, so far 13 species belongs to 9 genera under 2 subfamilies are known from through the work of Chandra *etal.*(2012) and Chandra (2014) from Achanakmar Amarkantak Biosphere Reserve, Chhattisgarh.

The present contribution is an attempt to provide a comprehensive account of the family Cicadellidae from Chhattisgarh. The present paper deals with 15 species belonging to 12 genera under 6 subfamilies. Out of these all are recorded for the first time from the state except *Ledra mutica* Fabr.

MATERIALS AND METHODS

Cicadellids were collected mainly by using the net sweep from the different districts of the state Chhattisgarh. Then they were sorted and mounted on the paper triangles for the identification. Followed by locality labels prepared, photographs and measurements were taken with the help of Leica M-205A stereo zoom microscope.

RESULTS**SYSTEMATIC LIST**

Order: HEMIPTERA
 Suborder: AUCHENORRHYNCHA
 Infraorder: CICADOMORPHA
 Superfamily: MEMBRACOIDEA
 Family: Cicadellidae
 Subfamily I: Cicadellinae
 Tribe: Cicadellini
 Genus 1: *Cofana* Melichar, 1926

1. *Cofana spectra* (Distant)
2. *Cofana unimaculata* (Sign.)
3. *Cofana lineata* (Distant)
 Genus 2: *Bothrogonia* Melichar, 1926
4. *Bothrogonia ferruginea* (Fabr.)
 Genus 3: *Atkinsoniella* Distant,
5. *Atkinsoniella sulphurata* Distant
 Genus 4: *Kolla* Distant, 1908
6. *Kolla insignis* Distant
 Subfamily II: Deltocephalinae
 Tribe: Hecalini
 Genus 5: *Hecalus* Stal, 1864
7. *Hecalus fascialis* Distant
 Genus 6: *Scaphoideus* Uhler, 1888
8. *Scaphoideus insignis* Distant
 Subfamily III: Ledrinae
 Tribe: Ledrini
 Genus 7: *Ledropsis* White, 1885
9. *Ledropsis obliques* Walk
10. *Ledropsis angularis* Distant
 Genus 8: *Ledra* Fabr, 1803
11. *Ledra mutica* Fabr.
 Genus 9: *Tituria* Stal, 1865
12. *Tituria acutangulata* Distant
 Subfamily IV: Idiocerinae
 Tribe: Idiocerini
 Genus 10: *Idiocerus* Lewis, 1836
13. *Idiocerus atkinsoni* Leth.
 Subfamily V: Iassininae
 Tribe: Krisnini
 Genus 11: *Krisna* Spin, 1852
14. *Krisna strigicollis* Spin.
 Subfamily VI: Evacanthinae
 Tribe: Nirvanini
 Genus 12. *Nirvana* Kirkaldy, 1900
15. *Nirvana pallida* Melichar

SYSTEMATIC ACCOUNT

Suborder: AUCHENORRHYNCHA
 Infraorder: CICADOMORPHA
 Superfamily: MEMBRACOIDEA
 Family: Cicadellidae

Key to the Subfamilies of the family
 Cicadellidae

1. Hind femur with only 3 short, stout macrosetae grouped at apex; proepisternum large, not concealed by gena..... Ledrinae.
 -. Hind femur without 3 short, stout macrosetae grouped at apex, if only three macrosetae present on femur, then one distinctly preapical; proepisternum concealed or exposed 2
2. Antennal ledge in dorsal view prominent; hind femur in repose not attaining posterolateral margin of prothorax 3
 -. Antennal ledge in dorsal view not prominent; hind femur in repose usually attaining posterolateral margin of prothorax...Cicadellinae
3. Forewing fully developed, vein r-m1 absent; frontoclypeus with partial or complete median longitudinal carina; or if carina absent, frontoclypeus strongly flattened medially, or front femur with single enlarged ventral seta near mid length, or both Evacanthinae
 -. Forewing fully developed with vein r-m1 present or brachypterous; or, if forewing fully developed and r-m1 absent, then frontoclypeus without median carina and not strongly flattened medially, and front femur without single enlarged ventral seta near midlength 4
4. Head with lateral frontal sutures partly or completely obsolete and not extended to ocelli; if head >2× longer than wide in dorsal view then ocelli not on or slightly above crown margin; male valve and subgenital plates partly to completely concealed by enlarged abdominal sternite VII..... Iassininae
 -. Head with lateral frontal sutures well developed and extended to or very near ocelli; or, if lateral frontal sutures not extended to ocelli, then either head >2× longer than wide in dorsal view and ocelli on or slightly above or below crown margin, or male valve and subgenital plates not concealed by enlarged abdominal sternite VII, or both 5

5. Forewing crossvein r-m1, if present, short, oblique, connected between R1 and R2+3, with two m-cu crossveins, or if three present, then s crossvein present and membrane not opaquely sclerotized; hind femur in repose reaching prothorax... ..Idiocerinae
 -. Forewing with or without one or more crossveins in clavus, or anal veins partially confluent; male subgenital plates not constricted basally, widest near base and tapered toward apex; valve with lateral margin short and posterior margin usually distinctly produced and angulate medially; style usually broadly bilobed basallyDectocephalinae

Subfamily I: Cicadellinae

Tribe: Cicadellini

Key to the genera of the Tribe Cicadellini

1. Pronotum dark brown anteriorly, medially with dark triangular patch; face reddish brown, anterior margin including clypeus with a black Y-shaped band.....*Kolla*
 -. Pronotum greenish with fine transverse impression; face not as above, centrally with white streak.....*Cofana*
2. Scutellum with an arcuate transverse impression before apical area.....*Bothrogonia*
 -. Scutellum with the apical area centrally broadly convexly ridged.....*Atkinsoniella*

Genus 1. *Cofana* Melichar, 1926

1926. *Cofana* Melichar, *Ann. Mus. Nat. Hist.*, 23: 245.

Key to the species of the genus *Cofana*

1. Head without a median apical black spot; head without median pale spot from crown to face.....*unimaculata*
 -. Head with a median apical black spot.....2
2. Head produced triangular, specimens smaller, head with median length six-tenths interocular width or more, with a median pronotal black line continuing onto scutellum.....*lineata*
 -. Head less produced, broadly rounded at apex, specimens larger and robust, head with median length less in relation to interocular width, female abdominal sternum vii with posterior

margin slightly undulate, but broadly convex.....*spectra*

1. *Cofana spectra* (Distant)

1908. *Tettigoniella spectra* Distant, *Fauna Brit. India, Rhynchota*, 4: 211

1910. *Cicadella spectra* Distant, *Insecta. Trans.*, 10: 234.

1990. *Cofana spectra*: Partact, *Cicadomorpha*; 3: 7

Material examined: 1 ex., Bhanpuri F.R.H., Jagdalpur, Dist. Bastar, 22.x.2011, Coll. R.P. Gupta *et al.* 2 ex., Marer Forest, Dist. Raipur, 8.viii.2012, Coll. Sunil & Party.

Diagnostic characters: 4 Black spots on vertex, scutellum yellowish, tegmina greenish with fuscus and rather pale veins; pronotum greenish with transverse striations, abdomen greenish yellow; legs pale ochraceous, tegmina with the veins very pale fuscous.

Measurements: Body length: 5.444 mm long; Length of vertex 0.373 mm, width across eyes 1.259 mm; length of pronotum 0.734 mm. width 1.248 mm; length of scutellum 0.490 mm, width 0.864 mm.

Distribution: India: Chhattisgarh (Bastar, Raipur); Tamil Nadu; Andhra Pradesh; Assam; Bihar; Karnataka; Maharashtra; Madhya Pradesh; Manipur; Meghalaya; Orissa; Sikkim; West Bengal. *Elsewhere*: Bangladesh; Nepal; Sri Lanka.

2. *Cofana unimaculata* (Signoret)

1854. *Tettigonia unimaculata* Signoret, *Ann. Soc. Ent. Fr.*, 26.

1902. *Kolla unimaculata* Distant, *Fauna Brit. India, Rhynchota*, 4: 224.

1986. *Cofana unimaculata* Young, *North Carol. Agril. Res. Serv. Tech. Bull.* 281: 613.

Material Examined: 2 ex., Barnwapara, Dist. Raipur, 10.vii.2011, Coll. Sunil & Party.

Diagnostic characters: Vertex with two dark black spots at anterior margin and two small black spots on disk; pronotum, its basal margin

black, triangularly produced at middle;
Scutellum at base two black elongate spots;

tegmina black, its costal margin brown
longitudinal band.



Fig. 1. *Cofana spectra* (Distant)



Fig. 2. *Cofana unimaculata* (Sign.)



Fig. 3. *Cofana lineata* (Distant)



Fig. 4. *Bothrogonia ferruginea* (Fabr.)



Fig. 5. *Atkinsoniella sulphurata* Distant



Fig. 6. *Kolla insignis* Distant



Fig. 7. *Hecalus fascialis* Distant



Fig. 8. *Scaphoideus insignis* Distant



Fig. 9. *Ledropsis obliquens* Walk.



Fig. 10. *Ledropsis angularis* Distant



Fig. 11. *Ledra mutica* Fabr.



Fig. 12. *Tituria acutangulata* Distant

Fig. 13. *Amritodus atkinsoni* (Leth.)Fig. 14. *Krisna strigicollis* Spin.Fig. 15. *Nirvana pallida* Melichar

Measurements: Body length: 4.619 mm long. Length of vertex 0.372 mm, width across eyes 1.234 mm; length of pronotum 0.814 mm. width 1.256 mm; length of scutellum 0.465 mm, width 0.791 mm.

Distribution: India: Chhattisgarh (Raipur); Tamil Nadu; West Bengal: *Elsewhere:* Myanmar, Philippines.

3. *Cofana lineata* (Distant)

1908. *Kollalineatus* Distant, *Fauna of Brit. India, Rhynchota*, 4 : 224

1986. *Cofanalineate* Young, *North Carol. Agril. Res. Serv. Tech. Bull.* 281: 614

Material examined: 1 ex., Machhlikhadika, Dist. Koriya, 8.x.2011, Coll: Mandal *et al.*; 1 ex., Kalaihirya, Dist. Koriya, 10.x.2011, Coll. Mandal *et al.*.

Diagnostic characters: Vertex with a black central discal spot; pronotum with a central longitudinal fuscous fascia, tegmina with the veins and margins fuscous; head with a median pronotal black line continuing onto scutellum.

Measurements: Body length: 5.652 mm long; Length of vertex 0.493 mm, width across eyes 1.310 mm; length of pronotum 0.851 mm. width

1.254 mm; length of scutellum 0.470 mm, width 0.695 mm.

Distribution: India: Chhattisgarh (Koriya); North & Central India; *Elsewhere:* Sri Lanka

Genus 2: *Bothrogonia* Melichar, 1926

1926. *Bothrogonia* Melichar, *Ann. Mus. Nat. Hist. Hung.*, 23: 341

4. *Bothrogonia ferruginea* (Fabr.)

1794. *Tettigoniella ferruginea* Fabr. *Entomologia. Syst.* 4: 32.

1986. *Bothrogonia ferruginea* Young, *NorthCarol. Agril. Res. Serv. Tech. Bull.* 281: 196.

Material examined: 1 ex., Luaha Beat, Jagdalpur, Dist. Bastar, 4.xi.2011, Coll. R.P. Gupta *et al.*; 2 ex., Badgaon, Dist. Raipur, 28.iii.2012, Coll. Sunil & Party.

Diagnostic characters: Vertex with three black spots, one spot at apex and others between ocelli; pronotum with three black spots, one spot at anterior margin and other two at base; scutellum centrally with a black spot, tegmina purplish red, with a black spot at base, at apex a broadly black patch; legs blackish.

Length: 5.788 mm long.

Measurements: Body length: 5.788 mm long; Length of vertex 0.455 mm, width across eyes 1.237 mm; length of pronotum 0.747 mm. width 1.342 mm; length of scutellum 0.653 mm, width 1.038 mm.

Distribution: India: Chhattisgarh (Bastar, Raipur); West Bengal; Maharashtra; Assam; *Elsewhere:* Sri Lanka; Philippine; Singapore Island; Nepal; Japan.

Genus 3: *Atkinsoniella* Distant, 1908

1908. *Atkinsonella* Distant, *Fauna Brit. India, Rhynchota*, 4: 235.

5. *Atkinsoniella sulphurata* Distant

1908. *Tettigoniella sulphurata* Distant, *Fauna Brit. India, Rhynchota*, 4: 216

1986. *Atkinsoniella sulphurata* Young, *NorthCarol. Agril. Res. Serv. Tech. Bull.*, 281: 98.

Material Examined: 1 ex., Dhanpconji, Jagdalpur, Dist. Bastar, 24.vii.2012 Coll. R.P. Gupta *et al.*

Diagnostic Character: Vertex with three black spots, one transverse at apex and two round at base; eyes black; pronotum with six black spots, three near anterior and three at posterior margin, the later sometimes fused; tegmina with the costal margin abruptly widened before apex, finely wrinkled and obscurely punctate.

Measurements: Body length: 4.192 mm long; Length of vertex 0.187 mm, width across eyes 0.935 mm; length of pronotum 0.513 mm. width 0.976 mm; length of scutellum 0.547 mm, width 0.799 mm.

Distribution: India: Chhattisgarh (Bastar); Assam; Meghalaya.

Genus 4. *Kolla* Distant, 1908

1908. *Kolla* Distant, *Fauna Brit. India, Rhynchota*, 4: 223

6. *Kolla insignis* Distant

1908. *Kolla insignis* Distant, *Fauna Brit. India, Rhynchota*, 4: 223

1965. *Kolla insignis*: *Metcalf, Gen. Cat. Hom.*, 6: 441

Material Examined: 1 ex., Hardinala, Dist. Raipur, 7.viii.13, Coll. Sunil & Party; 1 ex., Karparand, Bastar, Jagdalpur, Dist. Bastar, 7.viii.13, Coll. R.P. Gupta *et al.*; 1 ex., Barnwapara WLS, Dist. Raipur, 16.i.2012, Coll. Sunil & Party.

Diagnostic Character: Vertex with two spots and with three spots centrally, anterior spots united by a short thick line; pronotum bronzy black with a wavy transverse fascia close to anterior margin; scutellum with black spot at each basal angle; tegmina shiny black, apical cell pigmented.

Measurements: Body length: 5.522 mm long; Length of vertex 0.419 mm, width across eyes 1.340 mm; length of pronotum 0.665 mm. width 1.282 mm; length of scutellum 0.583 mm, width 0.978 mm.

Distribution: India; Chhattisgarh (Raipur, Bastar); Uttarakhand; Manipur; Meghalaya; Sikkim; Uttarpradesh; West Bengal.

Subfamily II: Deltocephalinae

Genus 5. *Hecalus* Stal, 1864

1864. *Hecalus* Stal, *Ann.Soc. Ent. Fr.*, 4 (4): 65

7. *Hecalus fascialis* Distant

1918. *Hecalus fascialis* Distant, *Fauna Brit. India. Rhynchota*, 4: 344.

1973. *Hecalus fascialis*: Morrison, *Pacific insects* 15(3-4): 428

Material Examined: 2 ex., Barnwapara, Dist. Raipur, 8.vii.2011, Coll. Sunil & Party; 2 ex., Amapani, Dist. Koriya, 14.x.2011, 8.vii.2011, Coll. Sunil & Party.

Diagnostic character: Vertex of head shorter than pronotum and scutellum together, the apical margin broadly rounded; pronotum anteriorly, obliquely broadly carinate; scutellum transversely impressed before apex; face moderately striate on its lateral areas.

Measurements: Body length: ♀ 5.219 mm to tip of the wing, 5.624 mm to the tip of ovipositor; Length of vertex 0.872 mm, width across eyes 1.359 mm; length of pronotum 0.616 mm, width 1.394 mm; Length of scutellum 0.569 mm, width 1.011 mm.

Distribution: India: Chhattisgarh: (Raipur, Koriya); Tamil Nadu; West Bengal.

Genus 6. *Scaphoideus* Uhler, 1888

1888. *Scaphoideus* Uhler, *Trans. Maryl. Ac. Sci.*: 33

8. *Scaphoideus insignis* Distant

1918. *Hussa insignis* Distant, *Fauna Brit. India, Rhynchota*, 7: 68

1977. *Scaphoideus insignis*: Barnett, *Tran. American. Ent. Soc.*, 102: 485-593.

Material Examined: 2 ex., Makdi F.R.H., Jagdalpur, Dist. Bastar, 4.vi.2011, Coll. R.P. Gupta *et al.*; 1 ex., Wat Thodgi, Dist. Koriya, 2.xi.2011, Coll. Mandal *et al.*; 1 ex., Karpavand

village, Jagdalpur, Dist. Bastar, 3.viii.2013, Coll. Sunil & Party.

Diagnostic Character: Head, pronotum and scutellum pale ochraceous; small anterior marginal spots to vertex and a larger marginal spot a little before each eye, two discal linear sanguineous fasciae traversing vertex, pronotum and scutellum; body beneath and legs pale ochraceous; intermediate and posterior tibiae spotted with black;

Measurements: Body length: 4.938 mm long; Length of vertex 0.442 mm, width across eyes 1.023 mm; length of pronotum 0.546 mm, width 1.081 mm; length of scutellum 0.488 mm, width 0.802 mm.

Distribution: India: Chhattisgarh (Bastar, Koriya); Tamil Nadu.

Subfamily III: Ledrinae

Tribe: Ledrini

Genus 7. *Ledropsis* White, 1885

1885. *Ledropsis* White, *A.M.N.H.* (1) xiv: 425

Key to the species of the genus *Ledropsis*

1. Head considerably longer than width between outer margin of eyes; the tibiae outwardly testaceous or brownish-ochraceous.....*obligens*
-. Head not that much longer than width between outer margin of eyes; the tibiae more or less mottled with testaceous.....*angularis*

9. *Ledropsis obligens* Walk.

1858. *Ledropsis obligens* Walk., *List. Hom. Suppl.*: 251

1962. *Ledropsis obligens*: Metcalf, *Gen. Cat. Homoptera* 6(4): 91

Material examined: 1 ex., Sankra R.H., Dist. Dhamtari, 16.x.2011, Coll. Sunil *et al.*

Diagnostic Character: Pronotum shorter than vertex, finely transversely rugose, body beneath and legs pale ochraceous, the tibiae outwardly testaceous or brownish-ochraceous, tegmina testaceous brown or brownish-ochraceous, abdomen above testaceous or brownish-ochraceous.

Measurements: Body length: 7.620 mm long; Length of vertex 1.773 mm, width across eyes 1.459 mm; length of pronotum 1.460 mm. width 1.902 mm; length of scutellum 0.735 mm, width 1.214 mm.

Distribution: India: Chhattisgarh: (Dhamtari); Sikkim; Tamil Nadu; West Bengal.

10. *Ledropsis angularis* Distant

1916. *Ledropsis angularis* Distant, *Fauna Brit. India, Rhynchota*, 6: 222

1962. *Ledropsis angularis*: Metcalf, *Gen. Cat. Hom.*, 6(4): 88

Material Examined: 1 ex., Barnwapara, Dist. Raipur, 7.vii.2011, Coll. Sunil & Party.

Diagnostic Character: Head pronotum and scutellum testaceous brown, apical area of head is paler, posterior margin of pronotum greenish, body beneath and legs greyish, the tibiae more or less mottled with testaceous, tegmina greyish white, vertex of head about one-third longer than space between eyes.

Measurements: Body length:6.429 mm long; Length of vertex 1.447 mm, width across eyes 1.459 mm; length of pronotum 1.006 mm. width 1.540 mm; length of scutellum 0.772 mm, width 0.875 mm.

Distribution: India: Chhattisgarh: (Raipur); Tamil Nadu.

Genus 8. *Ledra* Fabr, 1803

1803. *Ledra* Fabr, *Syst. Rhyn.*: 24

11. *Ledra mutica* Fabr.*

1803. *Ledra mutica* Fabr, *Syst. Rhyn.*: 25

1962. *Ledra mutica*: Metcalf, *Gen. Cat. Hom.* 6(4): 39

Material Examined: 1 ex., Barnwapara, Dist. Raipur, 9.vii.2011, Coll. Sunil & Party.

Diagnostic Character: Head, pronotum, scutellum, tegmina, body beneath and legs ochraceous; abdomen above testaceous; vertex of head as long as space between eyes. Pronotum granulate, transversely impressed on disk behind

anterior margin, moderately gibbous posteriorly where there are four fine discal longitudinal ridges, in front of the transverse impression the granules are a little larger and more prominent. Tegmina with a number of scattered granules on basal half.

Measurements: Body length:8.839 mm long; Length of vertex 1.628 mm, width across eyes 2.349 mm; length of pronotum 1.430 mm. width 2.285 mm; length of scutellum 1.023 mm, width 1.202 mm.

Distribution: India: Chhattisgarh (Raipur); Karnataka; Punjab; Uttar Pradesh; Bihar; Maharashtra; West Bengal; Tamil Nadu. *Elsewhere:* Myanmar.

Genus 9. *Tituria* Stal, 1865

1865. *Tituria* Stal, *Ofv. Ak. Forh.*: 158

12. *Tituria acutangulata* Distant

1908. *Tituria acutangulata* Distant, *Fauna Brit. India, Rhynchota*, 4: 161

1962. *Tituria acutangulata*: Metcalf, *Gen. Cat. Hom.* 6(4): 61

Material Examined: 1 ex., Kalajhirya, Dist. Koriya, 10.x.2011, Coll. Mandal *et al.*

Diagnostic character: Body and legs ochraceous; lateral margins of vertex of head testaceous, tegmina greenish; Head and pronotum somewhat thickly finely punctate; Vertex about half as long as space between eyes, anteriorly obtusely angulate; Pronotum with the lateral angles strongly acute; Tegmina thickly coarsely punctate.

Measurements: Body length:8.714 mm long; Length of vertex 1.023 mm, width across eyes 2.767 mm; length of pronotum 1.162 mm. width 4.627 mm; length of scutellum 1.920 mm, width 1.952 mm.

Distribution: India: Chhattisgarh: (Koriya); North India; Tamil Nadu.

Subfamily IV: Idiocerinae

Tribe: Idiocerini

Genus 10. *Amritodus* Anufriev, 1970

1970. *Amritodus* Anufriev, *J. Nat. Hist. Soc.*, 4: 375-376

13. *Amritodus atkinsoni*(Leth.)

1889. *Idiocerus atkinsoni* Leth., *J.A.S.B.* 18: 252
1970. *Amritodus atkinsoni* Anufriev, *J. Nat. Hist.*, 4(3): 375-380.

1989. *Amritodus atkinsoni* : Ghosh, Biswas, Chakraborty and Sen, Fauna of Orissa (Insecta: Hemiptera): State Fauna Series No. 1. Pt. 2: 196.
Material examined: 32 ex., Bhanpuri F.R.H., Jagdalpur, Dist. Bastar, 20.x.2011, Coll. R.P.Gupta & Renu.

Diagnostic character: Vertex anteriorly rounded, smoky; Clypeus flattened, well developed with black stripes, laterally striate; Pronotal disk brown, anterior margin with two spots and a dark brown stripe; scutellum bears a dark brown streak, Tegminal veins dark; prosternal disk with two black spots.

Measurements: Body length: 5.165 mm long; Length of vertex 0.279 mm, width across eyes 2.002 mm; length of pronotum 0.698 mm. width 1.734 mm; length of scutellum 0.931 mm, width 1.421 mm.

Distribution: India: Chhattisgarh: (Bastar); West Bengal; Delhi; Maharashtra. *Elsewhere*: Sri Lanka.

Subfamily V: Iassinae**Tribe: Krisnini****Genus 11. *Krisna* Spin, 1852**

1852. *Krisna* Spin, *Mem. di. Matem. e di Fis. Soc. Ital. Modena*: 167.

14. *Krisna strigicollis* Spin

1852. *Krisna strigicollis* Spin. *Mem. e di Matem. e di Fis. Soc. Ital. Modena*: 167

Material examined: 1 ex., Kotamsar F.R.H., Jagdalpur, Dist. Bastar, 17.iii.2007, Coll: Dr. R.M. Sharma.

Diagnostic Character: Pale ochraceous, sometimes with a slight greenish tint; two small black spots at apex of vertex and one at apex of each clavus; vertex with the anterior margin reflexed and often more or less sanguineous; pronotum strongly transversely striate; tegmina rugulose and punctate; wings milky white.

Measurements: Body length: 5.601 mm long; Length of vertex 0.277 mm, width across eyes 1.121 mm; length of pronotum 0.762 mm. width 1.640 mm; length of scutellum 0.947 mm, width 1.282 mm.

Distribution: India: Chhattisgarh (Bastar); West Bengal; Maharashtra; Tamil Nadu; *Elsewhere*: Myanmar; Cambodia; Philippines; North China.

Subfamily VI: Evacanthinae**Tribe: Nirvanini****Genus 12. *Nirvana* Kirkaldy, 1900**

1900. *Nirvana* Kirkaldy, *Entomologist*: 293

15. *Nirvana pallida* Melichar

1903. *Nirvana pallida* Melichar, *Hom. Fauna. Ceylon*: 166

1963. *Nirvana pallida*: Metcalf, *Gen. Cat. Homoptera* 6(7): 10

Material Examined: 1 ex., Rapa, Dist. Koriya, 6.xi.2011, Coll. Mandal *et al.*

Diagnostic Character: Pale yellowish-white, shining; in the middle of the vertex a pale white line running from the base to the tip of the front and becoming indistinct almost produced to the hind border of the pronotum; pronotum with an impressed, curved, oblique line near the front margin; wings hyaline with tender white veins; pectus, abdomen and legs pale yellowish-white, the back sometimes tinged with orange-yellow.

Measurements: Body length: 5.170 mm long; Length of vertex 1.001 mm, width across eyes 0.955 mm; length of pronotum 0.349 mm. width 0.920 mm; length of scutellum 0.711 mm, width 1.001 mm.

Distribution: India: Chhattisgarh (Koriya); West Bengal; Karnataka. *Elsewhere*: Japan; Sri Lanka; Indochina; Hongkong; Singapore; Southern Japan; Myanmar.

SUMMARY

This paper reports 15 species of cicadellids under 12 genera belonging to 6 subfamilies from

the state of Chhattisgarh. Of this one species (marked with *) already known from the state. The diagnosis of each species along with measurements keys to various taxa, distributions of each species in different districts of Chhattisgarh, other states as well as from elsewhere along with relevant references have also been incorporated.

ACKNOWLEDGMENT

Authors are grateful to Dr. C. A. Viraktamath, Scientist Emeritus (University of Agricultural Sciences GKVK, Bangalore) for helping in identification of the specimens and for providing needful literature for our study. Authors are also grateful to Dr. K. Venkataraman, Director, ZSI, for providing all necessary facilities. We would like to thank Dr. K. A. Subramanian, Scientist-C, Divisional-in-Charge, Entomology Division-B. for his numerous courtesies.

REFERENCES :

1. Chandra, K. 2014, Fauna of Achanakmar Amarkantak Biosphere Reserve, Chhattisgarh and Madhya Pradesh (Edited. K. Venkatraman), *Zoological Survey of India, Conservation Area Series*, 49: 1-292.
2. Chandra, K. *et al.*, 2012, Diversity of Grassland Auchenorrhyncha (Cicadidae, Cercopidae, Cicadellidae) in Madhyapradesh and Chhattisgarh, India, *IJPAES*, 2(4): 257-263.
3. Dietrich, C.H. 2005. Keys to the families of Cicadomorpha and subfamilies and tribes of Cicadellidae (Hemiptera: Auchenorrhyncha), *Florida Entomologist* 88(4): 502-517.
4. Distant, W.L. 1908. *The Fauna of British India, including Ceylon and Burma, Rhynchota*, 4: 157-419.
5. Distant, W.L. 1916. *The Fauna of British India, including Ceylon and Burma, Rhynchota*, 6: 217-240.
6. Distant, W.L. 1918. *The Fauna of British India, including Ceylon and Burma, Rhynchota*, 7: 1-109.
7. Ghosh, L.K. and Ghosh, M. 1994. Insecta: Hemiptera: Homoptera: Cicadelloidea.

- Fauna of West Bengal, State Fauna Series* 3(Part-5): 30-67.
8. Metcalf, Z.P. 1965. *General Catalogue of the Homoptera, Fascicle VI, Part 1*: 1-730
 9. Metcalf, Z.P. 1965. *General Catalogue of the Homoptera, Fascicle VI, Part 10*: 1-2694
 10. Morrison, P. 1973. A Revision of the Hecalinae (Homoptera: Cicadellidae) of the Oriental Region, *Pacific Insects*, 15 (3-4): 379-438.
 11. Oman, P.W., Knight, W.J. & Nielson, M.W. 1990. *Leafhoppers (Cicadellidae)-A bibliography, generic checklist and index to the world literature 1956-1985*. C.A.B. International Institute of Entomology: 368pp.
 12. Viraktamath, C.A. 1979. Few new species of Idioscopus (Homoptera: Cicadellidae) from Southern India. *Entomon.*, 4: 173-181.
 13. Viraktamath, C.A. 2004. A revision of the deltocephaline leafhopper genus scaphoideus (Hemiptera: Cicadellidae) from the Indian subcontinent, *Zootaxa* 578: 1-48.
 14. Viraktamath, C.A. 2005. Key to the Subfamilies and Tribes of Leafhoppers (Hemiptera: Cicadellidae) of the Indian Subcontinent, *Bionotes*, 7(1): 20-48.
 15. Young, D.A. 1986. Taxonomic Study of the Cicadellinae (Homoptera: Cicadellidae) Part 3. Old world Cicadellini, *North Carol. Agril. Res. Serv. Tech. Bull.* 281: 1-639.

DOI:

<https://dx.doi.org/10.5281/zenodo.7233206>

Received: 6 October 2014;

Accepted: 18 November 2014;

Available online : 6 December 2014
