



Description of a New Species of the Genus *Krisna* (Hemiptera: Cicadellidae: lassinae) from India

Authors: Meshram, Naresh M., and Ramamurthy, V. V.

Source: Florida Entomologist, 95(2) : 375-381

Published By: Florida Entomological Society

URL: <https://doi.org/10.1653/024.095.0220>

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

DESCRIPTION OF A NEW SPECIES OF THE GENUS *KRISNA* (HEMIPTERA: CICADELLIDAE: IASSINAE) FROM INDIA

NARESH M. MESHARAM¹ AND V. V. RAMAMURTHY²

^{1,2}Division of Entomology, Indian Agricultural Research Institute, New Delhi 110012, India

Corresponding authors; E-mails: ¹nmmeshram@gmail.com; ²vvrento@gmail.com

ABSTRACT

A new species, *Krisna pampadumparaensis*, is described from Pampadumpara, Kerala, India collected from *Ficus exasperata*. It is distinguished by its deeply transversely carinate vertex and without any anterior transverse black spot. Three prominent constrictions at the ventral lower margin of aedeagal shaft, hind margin of male eighth sternite medially slightly concave and its lateral angles slightly rounded are the other distinguishing characters. Aedeagus in caudal aspects with shallow concavity in the apical region, second pair of gonapophyses with a smooth area between basal and median teeth, margin between median and apical prominent teeth with denticles and margin beyond apical prominent teeth serrated up to tip, apex with undulated margin and ventral margin with subapical notch, make it distinct from *K. varia* Viraktamath with which it is closely related.

Key words: Leafhoppers, Krisnini, *Krisna pampadumparaensis*, *Ficus exasperata*

RESUMEN

Se describe una nueva especie, *Krisna pampadumparaensis* de la Pampadumpara, Kerala, India recolectada sobre *Ficus exasperata*. Se distingue por su vértice que es profundo y transversalmente carenado y sin ningún tipo de punto negro transversal anterior. Otras características distintas son las tres constricciones prominentes en el margen ventral inferior del eje del aedeago, el margen posterior del octavo esternito del macho quietiene la parte en medio ligeramente cóncavo y sus ángulos laterales ligeramente redondeados. El aedeago en su aspecto caudal con una concavidad poco profunda en la región apical, el segundo par de gonapofises con una superficie lisa entre los dientes basales y medianos, el margen entre los dientes medianos y los dientes prominentes apicales con denticulos y el margen más allá de los dientes apicales prominentes es serrado hasta la punta, el apice con el margen ondulado y el margen ventral con una muesca subapical que lo hace distinta de *K. varia* Viraktamath con el que esta estrechamente relacionado

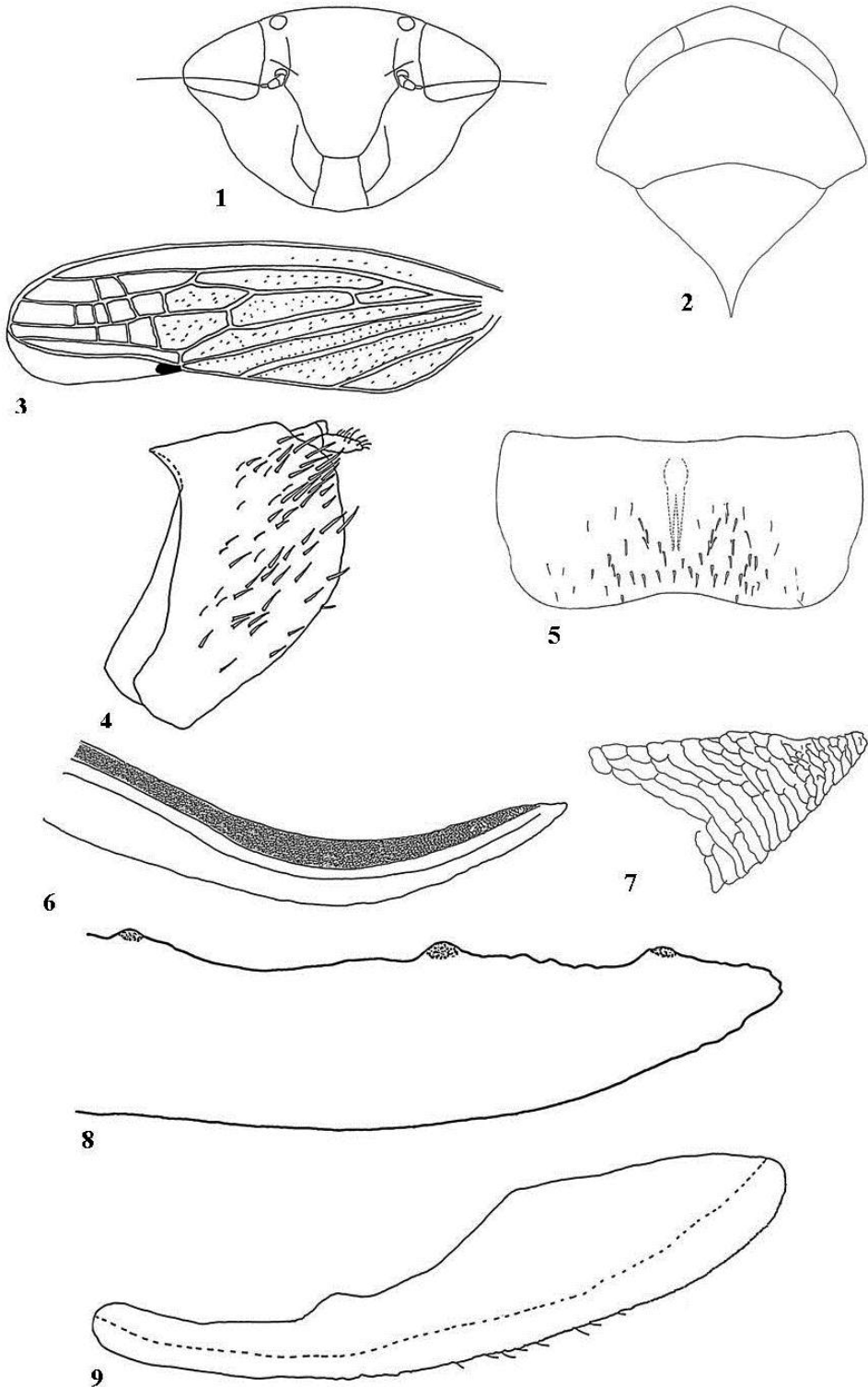
Iassininae comprises 7 tribes with over 2000 species in 146 genera (Oman et al 1990; Dietrich, 2005). Of these, tribe Krisnini includes the type genus erected by Kirkaldy (1900) with *Siva strigicollis* Spinola as its designated type species. Distant (1908) treated 3 species of Krisnini from the Indian subcontinent, while Baker (1919) dealt with its fauna from the Indo-Australian region and described 8 species. Viraktamath (2006) revised the genus from the Indian subcontinent, described 8 new species and speculated that its New World species placed under this genus probably do not belong here. The genus *Krisna* is distinguished from related genera by the forewing with accessory cross veins and the head angled or rimmed in front (Viraktamath 2006). Zhang et al. (2008) recently synonymized *Krisna burmanica* Viraktamath with *Krisna rufimarginata* Cai & He from China. There are 36 known *Krisna* species of which 8 are from India. The present study describes a new species *Krisnapam padumparaensis* Meshram collected from Pampadumpara

(9°47' 26.81"N 77° 9' 28.19"E), Kerala, India. The type material is with the National Pusa Collection, Division of Entomology, Indian Agricultural Research Institute, New Delhi, India (NPC).

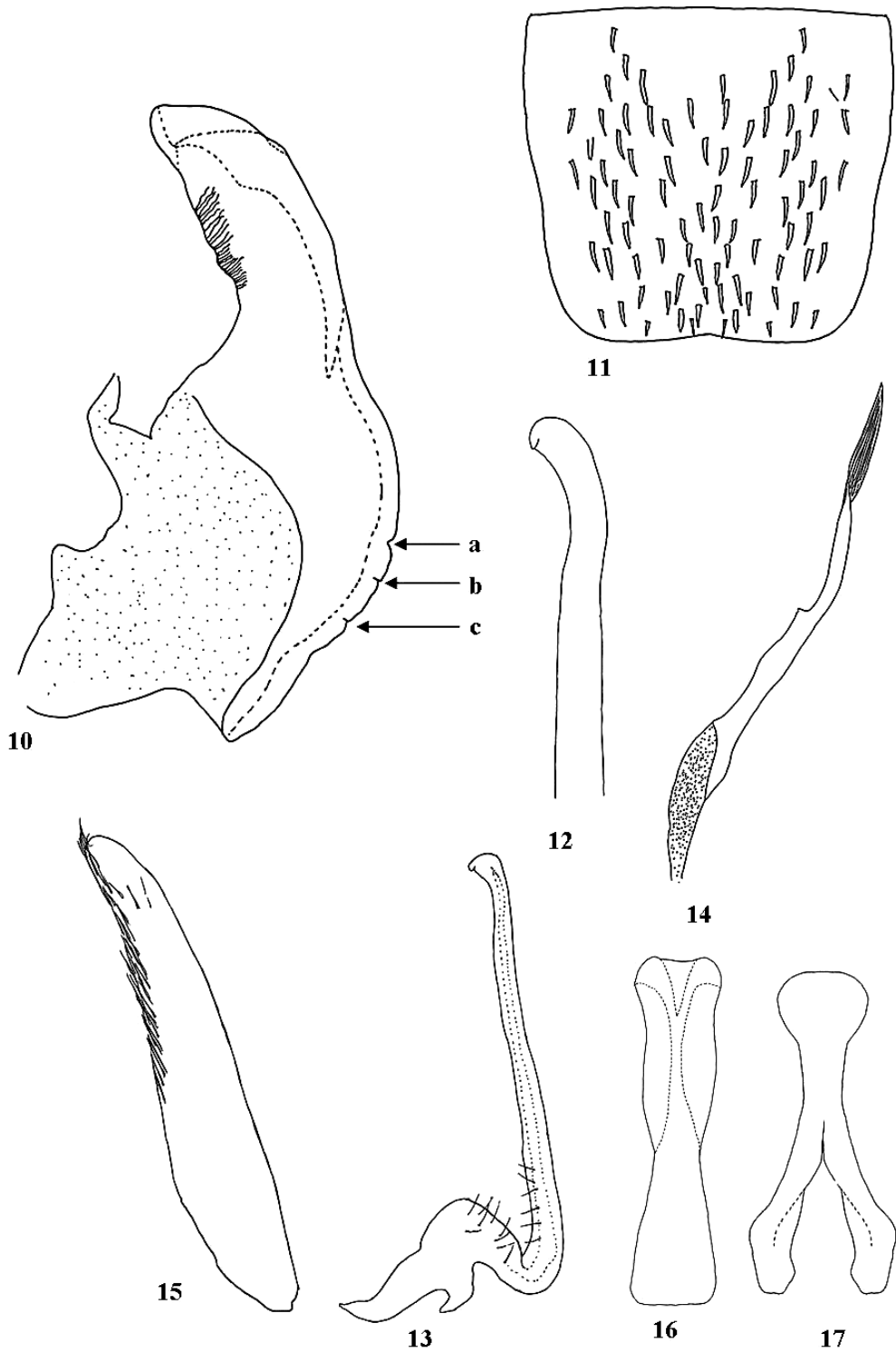
MATERIAL AND METHODS

The terminology followed is after Viraktamath (2006). Line diagrams were drawn using a drawing tube attached with a Leica MZ12 stereomicroscope and a Leica DM1000 phase contrast research microscope. Photographs were taken with a Leica DFC 425C digital camera on a Leica M205FA, and SEM images with a Carl Zeiss (EVO-MA 10) SEM in environmental mode under EHT 15 kV and pressure 110-123 P.

Male genitalia dissections were carried out as described by Oman (1949) and Knight (1965). The abdomen was removed by inserting a sharp pin between the abdomen and thorax and gentle piercing. For removal of the unsclerotized tissue, the abdomen was treated in 10% KOH for 2-4 h



Figs. 1-9. *Krisna pampadumparaensis* sp. nov.: 1-3 Male; 1. Face; 2. Head and thorax; 3. Forewing. 4-9 Female; 4. Pygofer; 5. Seventh sternite; 6. First pair of gonapophysis; 7. Sculpturing at apex of first pair of gonapophyses; 8. Second pair of gonapophyses; 9. Third pair of gonapophyses.



Figs. 10-17. Male *Krisna pampadumparaensis* **sp. nov.** 10. Aedeagus, ventral lower margin at arrow a, b, c with prominent constrictions; 11. Eight sternite; 12. Apex of apophysis of style; 13. Style; 14. Ventral pygofer process; 15. Subgenital plate; 16. Aedeagus caudal view; 17. Connective.

and the unsclerotized material removed by gently prodding the abdomen with the head of a pin. After the unsclerotized tissue had been removed, the abdomen was rinsed in water thoroughly and stored in glycerine for study. The internal structures were then removed by use of a hooked pin.

KRISNA PAMPADUMPARAENSIS MESHAM **SP. NOV.**
(Figs. 1-25)

Male: (Figs. 1-3, 10-17 and 18-21)

Originally greenish ochraceous changes to brownish red in 70% alcohol. Forewing with costal margin slightly transparent and appendix with basal a piceous spot.

Head medially longer than next to eyes, upper margin of the face transversely striated. Vertex slightly depressed, without any anterior transverse black spot, and deeply transversely carinate (Fig. 20). Clypellus strongly broadened apicad. Frontoclypeus sharply broadening upward (Figs. 1 and 19). Ocellus placed on front margin of crown next to corresponding eye and distance between the eye and ocellus is 0.52× of ocellus diam. Antennal ledges extending to frontoclypeus. Forewing-punctate; venation in apical part reticulate owing to 10 cross veins (Fig. 3). Pronotum with lateral margin carinate, Scutellum 1.13× as long as the pronotum. Pronotum 2.10× longer than broad and 3.22× longer than vertex (Figs. 2 and 20). Hind femoral spinulation 2+2+1. Eighth sternite 1.10× broader than long with macrosetae throughout its surface, hind margin medially slightly concave, lateral angles slightly rounded and densely covered with setae (Figs. 11 and 21)

Male Genitalia (Fig. 21): Ventral pygofer process sinuate at apex with small spine like projection at mid length, without spicules (Fig. 14). Style with type 1 apophysis long, 0.74× narrower than its base, slightly curved at apex with thickening extending to half of the width near apex; its basal region with small microsetae (Figs. 12 and 13). Aedeagal shaft with well developed preatrium, widened near mid length, ventral margin convex at apex, concave in mid and convex at basal region. Ventral lower margin of aedeagal shaft with three prominent constrictions at irregular intervals (Fig. 10). Aedeagus in caudal aspect with shallow concavity in the apical region (Fig. 16).

Female (Figs. 4-9 and 22-25)

Same as male except distance between the eye and ocellus 0.75× of ocellus diam.

Female Genitalia (Figs. 4-9 and 25). Seventh sternite 2.14× broader than long, setae confined to median area, lateral area with hair like setae, hind margin with shallow median concavity but without median notch, lateral angles rounded, mid

lateral margin slightly concave (Fig. 5). Second pair of gonapophyses with smooth area between basal and median teeth, margin between median and apical prominent teeth with denticles, and margin beyond apical prominent teeth serrated up to tip; apex with undulated margin and ventral margin with a subapical notch (Fig. 8). First pair of gonapophyses with sculpturing at the apex (Figs. 6 and 7). Third pair of gonapophyses with sparse hair like setae on mid hind margin (Fig. 9).

Measurements

Male 10.20 mm long, 2.39 mm wide across eyes, 3.01 mm wide across hind margin of pronotum. Female 11.45 mm long, 2.72 mm wide across eyes, 3.31 mm wide across hind margin of pronotum.

Host: *Ficus exasperata*

Remarks

Krisna pampadumparaensis **sp. nov.** closely resembles *K. varia* Viraktamath but differs in the following: 3 prominent constrictions at the ventral lower margin of aedeagal shaft (vs. ventral lower margin without any constriction in *K. varia*) and hind margin of male eighth sternite medially slightly concave and densely covered with setae (vs eighth sternite slightly convex and sparsely covered with setae in *K. varia*). Second pair of a gonapophyses with a smooth area between basal and median teeth, margin between median and apical prominent teeth with denticles, and margin beyond apical prominent teeth serrated up to tip; apex with undulated margin and ventral margin with a subapical notch. (vs. margin between basal and median and median and apical prominent teeth with denticles; apex with smooth margin and ventral margin without subapical notch of *K. varia*).

Type material

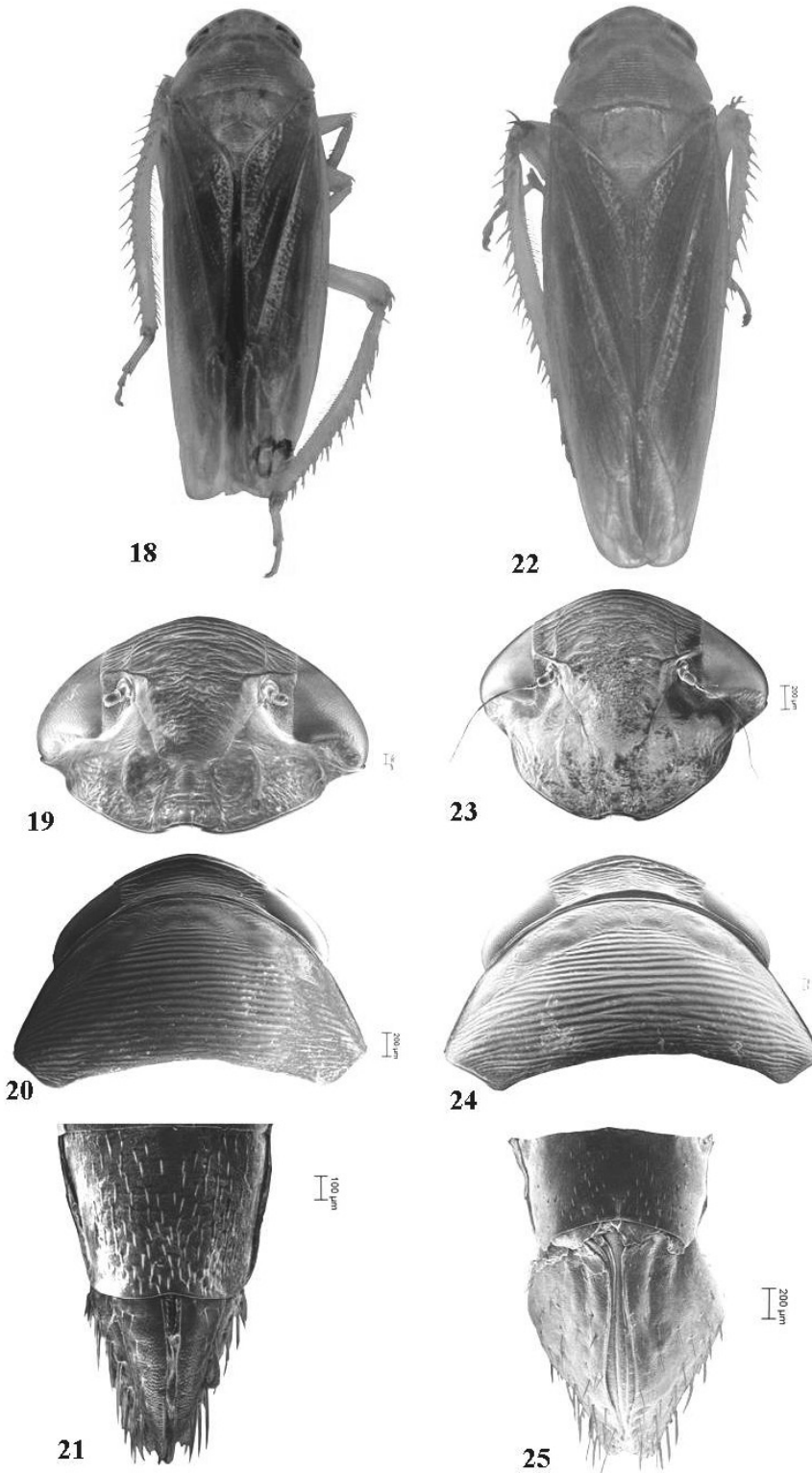
Holotype male INDIA: Kerala, Pampadumpara, 04-XII-2010, from stem and leaves of *Ficus exasperata*, N. M. Meshram; Paratypes: 1 male and 2 females with data as Holotype (NPC).

Etymology

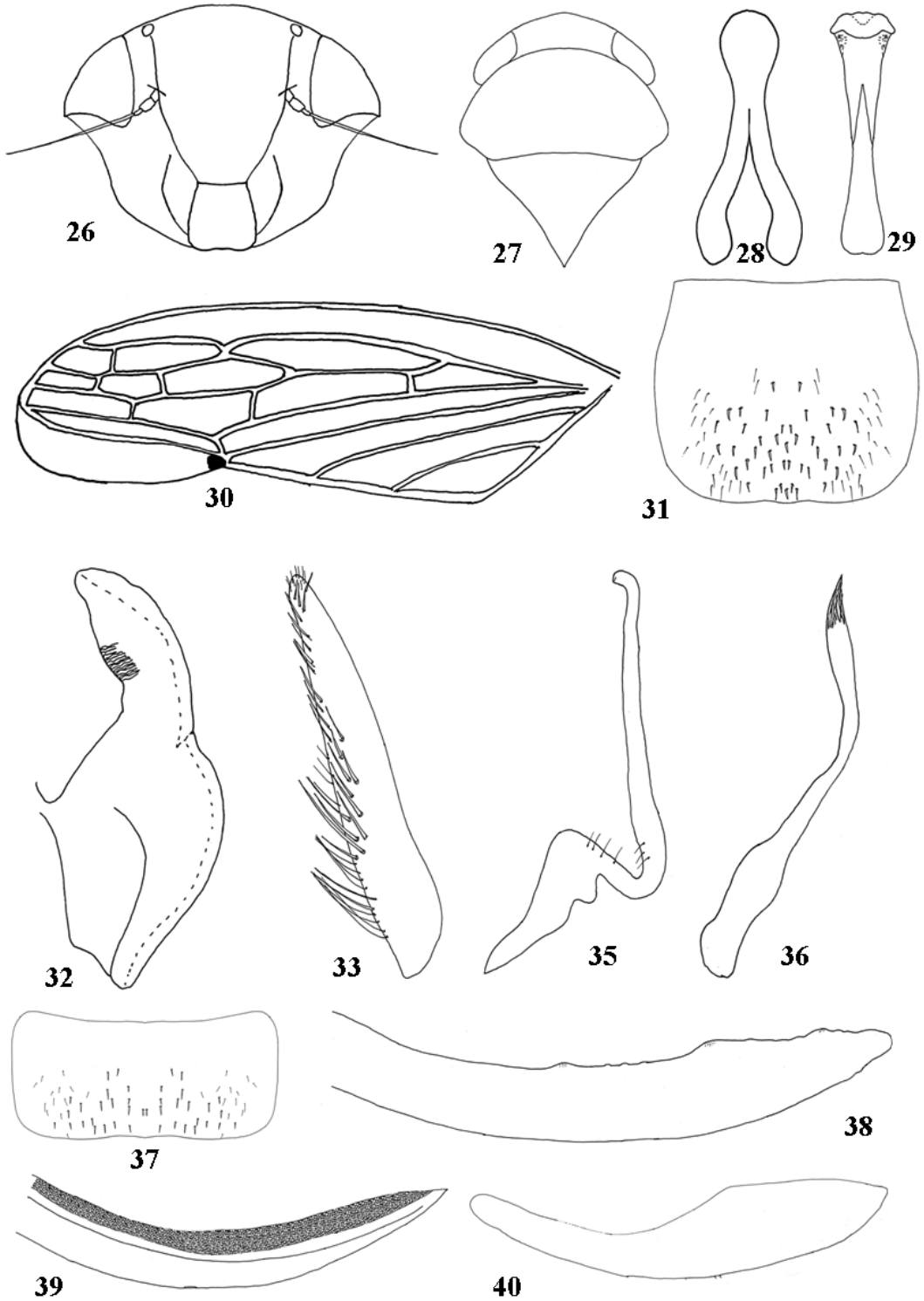
The species is named after the locality, Pampadumpara.

Ethology

This new species was found resting on the stem and leaves of *Ficus exasperata* during morning hours in Pampadumpara, Kerala, India.



Figs. 18-25. *Krisna pampadumparaensis* sp. nov.: 18-21; Male 18. Habitus; 19. Face; 20. Pronotum; 21. Genital capsule, ventral view; 22-25 Female 22. Habitus; 23. Face; 24. Pronotum; 25. Genital capsule, ventral view.



Figs. 26-40. *Krisna varia*: 26-35 Male; 26. Face; 27. Pronotum; 28. Connective; 29. Aedeagus caudal view; 30. Forewing; 31. Eighth sternite; 32. Aedeagus, lateral view; 33. Sugenital plate; 34 Apophysis of style; 35. Ventral pygofer process; 37-40 Female; 37. Seventh sternite; 38. Second pair of gonapophyses; 39. First pair of gonapophyses; 40. Third pair of gonapophyses.

KRISNA VARIA VIRAKTAMATH
(Figs. 26-40)

Material examined: INDIA: Karnataka: 1 male & 3 female Bangalore: GKVK, 7.vii.2011. from Croton, Yeshwanth H. M., Det. C. A. Virak-

tamath; Karnataka: 2 male, Chettalli, 3.v.2011, Shakti Singh.

In the key given by Viraktamath. (2006), this new species will key in at the couplet no. 6 leading to *K. raja* and *K. varia*. This is to be modified as follows:

6. Aedeagal shaft in lateral view short and stout, ventral pygophore process without spine like outgrowth or its remnant, slender, arched uniformly *K. raja* Viraktamath
- Aedeagal shaft in lateral view more elongate and slender; ventral pygophore process with or without spine like outgrowth, sinuate or bisinuate. 11
11. Hind margin of male eighth sternite medially slightly concave, ventral lower margin of aedeagal shaft without constrictions. Female seventh sternite with a median notch on hind margin; second pair of gonapophyses with denticles both between basal and median teeth, and median and apical prominent teeth with denticles; apex with smooth margin and ventral margin without subapical notch *K. varia* Viraktamath
- Hind margin of male eighth sternite medially slightly concave (Fig. 11), ventral lower margin of aedeagal shaft with three prominent constrictions at irregular intervals (Fig. 10). Female seventh sternite with shallow median concavity but without median notch (Fig. 5); second pair of gonapophyses with a smooth area between basal and median teeth, margin between median and apical prominent teeth with denticles, and margin beyond apical prominent teeth serrated up to tip; apex with undulated margin and ventral margin with a subapical notch (Fig. 8) *K. pampadumparaensis* **sp. nov.**

REFERENCES CITED

- BAKER, C. F. 1919. The genus *Krisna* (Jassidae). Philippine J. Sci. 15: 209-220.
- DIETRICH, C. H. 2005. Keys to the families of Cicadomorpha and subfamilies and tribes of Cicadellidae (Hemiptera: Auchenorrhyncha). Florida Entomol. 88: 502-517.
- DISTANT, W. L. 1908. Rhynchota-Homoptera *In* C. T. Bingham [ed.], The fauna of British India including Ceylon and Burma. Vol. IV, Taylor & Francis, London. 501pp.
- DOLLING, W. D. 1991. Biographies of the works of W. L. Distant and G. W. Kirkaldy. Tymbal Suppl. 1:1-60.
- HODKINSON, I. D., AND CASSON, D. 1991. A lesser predilection for bugs: Hemiptera (Insecta) diversity in tropical rain forests. Biol. J. Linn. Soc. 43: 101-109.
- KIRKALDY, G. W. 1900. Bibliographical and nomenclatorial notes on the Rhynchota. No. 1. Entomol. 33: 238-243.
- KNIGHT, W. J. 1965. Techniques for use in the identification of leafhoppers (Homoptera: Cicadellidae). Entomol. Gaz. 16: 129-36.
- OMAN, P. W., KNIGHT, W. J., AND NIELSON, M. W. 1990. Leafhoppers (Cicadellidae): A bibliography, generic checklist and index to the world literature 1956-1985. C.A.B. Int. Inst. Entomol., Oxon, U.K. 368pp.
- VIRAKTAMATH, C. A. 2006. Revision of the leafhopper tribe Krisnini (Hemiptera: Cicadellidae: Iassinae) of the Indian subcontinent. Zootaxa 1338:1-32.
- ZHANG, Y., ZHANG, X., AND DAI, W. 2008. Three new species of the genus *Krisna* Kirkaldy (Hemiptera: Cicadellidae: Iassinae) from China, with a checklist of the genus. Zootaxa 1783: 40-60.