



Illustrated redescription of two large coreid bugs from Assam including *Schroederia feana* (Distant, 1902) as the first record for India (Hemiptera, Heteroptera, Coreidae, Coreinae, Mictini)

Hemant V. Ghate^{1*}, Siddharth Kulkarni² and Vijay Anand Ismavel³

¹PG Research Centre, Department of Zoology, Modern College of Arts, Science and Commerce, Shivajinagar, Pune 411005, India

²Hemi Terrace Bldg., Balajinagar, Pune 411043, India (presently-Department of Biological Sciences, The George Washington University, Washington, D.C., 20052, USA);

³Makunda Nature Club, Makunda Christian Leprosy and General Hospital, Bazaricherra 788 727, Assam, India. Email: hemantghate@gmail.com

ABSTRACT: *Schroederia feana* (Distant, 1902) is recorded for the first time from the present Indian Territory and redescribed based on male specimen from Assam, India. In addition, *Prionolomia gigas* Distant, 1879 is redescribed based on male and female specimens from the same locality.

© 2017 Association for Advancement of Entomology

KEYWORDS: Coreidae, Mictini, Taxonomy, *Schroederia feana*, *Prionolomia gigas*

INTRODUCTION

During a brief survey on the private premises of Makunda Christian Hospital, Karimganj District, Assam, two interesting and large Coreidae bugs were collected. One was identified as *Schroederia feana* (Distant, 1902) and the other as *Prionolomia gigas* Distant, 1879, based on keys in Distant (1902). Generic characters and nomenclatural changes were confirmed using keys and descriptions in O'Shea and Schaefer (1980). *S. feana* was described as *Derepteryx feana* by Distant (1902) from Tenasserim, Thagata, in the present day Myanmar, and its transfer to the genus *Schroederia* has been discussed, with history, by O'Shea and Schaefer (1980). Dispons (1962) also studied *D.*

feana but he had placed it in another genus *Axinepteryx*, according to him the distribution of this species is : 'Burma, Thailand, Sumatra and Borneo' and O'Shea and Schaefer, who placed it in *Schroederia*, gave distribution as 'SE Asia, Indonesia'. Recent list of coreids of India (Prabakar, 2013) does not include *S. feana* from any part of India; its occurrence in Assam is therefore the first record of this coreid from India.

Prionolomia gigas, one of the largest coreid, is known to be present in Assam (Distant, 1879); Breddin (1900) described the female of this species, also from Assam. In spite of the fact that both bugs are quite large, these are not well illustrated or redescribed before. Revision of the tribe Mictini

* Author for correspondence

by O'Shea and Schaefer (1980), which includes both these species, gives only generic diagnosis, with the list of included species, and a few small-sized line drawings. Dispons (1962) however, described generic characters and also gave a key to all the species of *Prionolomia* as well as illustrated some major characters.

None of these previous works include photographic images of dorsal and ventral habitus of important diagnostic characters. To help in identification of these two bugs, especially for students and biodiversity surveyors, we are providing photographically illustrated redescription of both these species.

MATERIALS AND METHODS

Methods of morphometry and preparation of illustrations are described earlier (Kulkarni and Ghate, 2016). Synonyms are given by O'Shea and Schaefer (1980) and hence not reiterated here. Since there are three different spellings of *Schroederia* in the above paper, we confirmed the correct spelling in the original description (Schmidt, 1911) and the Coreoidea website was also checked for all species' names mentioned here (Coreoidea SF Team. *Coreoidea Species File Online*. Version 5.0 [Retrieval date May 26, 2016] <http://Coreoidea.SpeciesFile.org>).

RESULTS

Schroederia Schmidt, 1911

Schroederia feana (Distant, 1902)

Material examined: 1 ♂, India, Assam, Karimganj District, Bazaricherra, Makunda Christian Hospital Campus, on foliage, 16.iv. 2016, Rejoice Gassah and Vijay Anand Ismavel.

Measurements (in mm): Total length 33.5 mm measured from tip of abdomen to the tip of head (measured ventrally).

Length of antennal segments: I 10; II 7, III 6; IV 6.5. Length of fore femur 10, fore tibia 8, fore tarsus 5. Length of mid femur 10, mid tibia 9, mid tarsus

4.5. Length of hind femur 14, hind tibia 15, hind tarsus 4. Body breadth at scutellum 9; maximum distance between inner margin of pronotal expansion 17; pronotal expansion length 11.

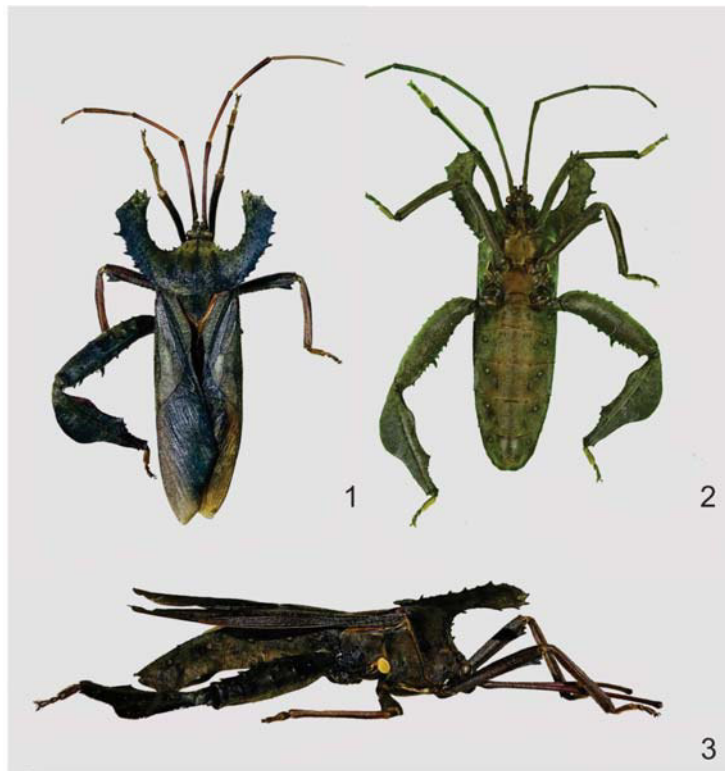
Redescription:

Colouration: Robust, moderately elongate bug, with bizarre process on pronotum; colour dark, brown to blackish. Head with antennae dark brown to blackish, pale ochraceous vertical band behind ocellus. Thorax with pronotum showing median dark line and similar but shorter line on each side. Prosternum dark brown, mesosternum ochraceous with brown band on either sides of labium, metasternum reddish brown. Abdomen dorsally reddish ochraceous with scattered pale areas; abdomen ventrally reddish brown on disc, laterally slightly darker; spiracles large, with white ring. Inner part of mid-coxae ochraceous (Figs. 1-3).

Morphology:

Head quadrate; antenniferous tubercles prominent, projecting in front beyond clypeus; eyes large, semi-globular; ocelli closer to eyes than to each other; shallow transverse sulcus at level of each ocellus; postocular tubercles small but distinct. Entire dorsal surface of head with very fine, moderately long, colourless setae. Antennae robust, hirsute, slightly shorter than body; first segment longest, second and third subequal, covered densely with long black and short colourless setae. Head underneath less setose; labium stout and long, reaching mid coxae, first segment stout, second and third less thick, second segment longest. Clypeus slightly depressed below mandibular plates which are oblique and oval, both seen only in frontal view of head, below projecting antenniferous tubercles (Figs. 4-6).

Thorax: Pronotum strongly declivous, with thin median carina, rugulose punctate on disk, with scattered granules and very fine golden setae; shape bizarre. Posterior 1/3rd of lateral margin produced laterally and anteriorly into wing-like expansions; lateral border in front of this expansion with strong, long and small spines, these spines continued along entire border of expansion; outer



Figures 1-3: *Schroederia feana*. 1: Habitus, dorsal; 2: Habitus, ventral; 3: Habitus, lateral.

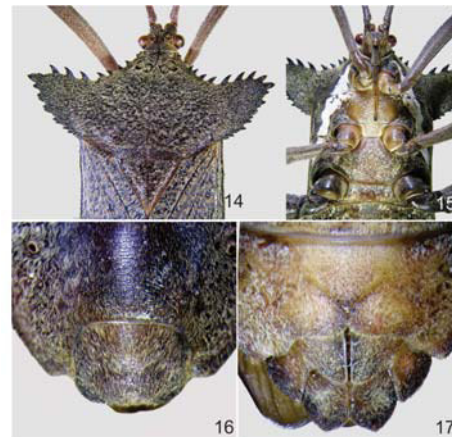


Figures 4-7: *Schroederia feana*. 4: Details of pronotum, dorsal; 5: Details of Pronotum, ventral; 6: Details of pronotal lateral margin, dorsal; 7: Details of pronotal wing-like expansion, dorsal.



Figure 8-9 *Schroederia feana*.

8: Scutellum; 9: Male, abdomen ventral view with pygophore in situ.



Figures 14-17: *Prionolomia gigas*. 14: Details of head and pronotum, dorsal; 15: Details of head and sternum, ventral, note lateral ochraceous band; 16: Male ventral view showing pygophore in situ; 17: Female terminalia in situ, ventral view.



Figures 10-13: *Prionolomia gigas*. 10: Male, habitus, dorsal; 11: Male, habitus, ventral; 12: Female, habitus, dorsal; 13: Female, habitus, ventral.

border of expansion with strong and long spines, apical lateral region more or less truncate on outside, with two inner strong spines (Fig. 7); anterior margin of pronotum straight, anterior angles of pronotum with broad tubercle just behind collar, posterior margin over scutellum more or less straight; posterior border in front of scutellum setose with very fine granules; lateral area with spiny tubercles. Prosterum narrow, with median sulcus, its posterior tip arrow-like, lateral parts of prosternum smooth, with scattered fine punctures; underside of anterior expansion of pronotum concave, possessing scattered granules and fine folds; mesosternum more or less smooth, finely setose, mesosternal process tongue-like, squarish, projecting posteriorly between mid coxae to meet anterior truncate projection of metasternum; metasternum with fine granules and setae, its lateral extension continued as anterior border to scent gland. Scent gland prominent with a large anterior disc and a very small posterior disc on either side of ostiole.

Scutellum almost as long as broad, triangular, dark brown, transversely wrinkled in posterior half; apically ochraceous (Fig. 8).

Hemelytra long, clavus densely punctured and covered with golden setae; corium identical to clavus with veins dark and raised distinctly; membrane dark brown with sparse golden setae and with many, longitudinal parallel veins.

Leg moderately robust; hind legs conspicuously incrassate; forefemur slightly laterally compressed, tarsi of lighter colour due to dense covering of golden setae on underside of first tarsal segment. Claws black, colourless pulvilli prominent; second and third tarsal segment with dorso-median, smooth longitudinal line, rest area setose; middle femur laterally compressed, ventro-medially uniformly dentate along entire length, with one large and one small spine at apex, apically apparently dilated; tibia laterally compressed; tarsal segments dorsally dark brown with black setae, ventrally with dense golden pubescence; hind femur much incrassate, strongly dentate on dorsal and ventral surfaces and granular

elsewhere; hind tibiae slightly shorter than femora, possessing dorsal and ventral expansions; ventral expansion with post medial strong triangular process, proximal part of inner margin just behind ventral spine granular, remaining border beyond triangular spine with distinct spines; distal tip with spine at right angle to dorsal and ventral margin. All legs with dense setae of three types: black, long setae, colourless pale brown setae and fine, small colourless setae.

Abdomen beneath more or less smooth with shorter, fine golden setae; trichobothrial groups very distinct; abdominal spiracles distinct, large, situated closer to anterior border than lateral border of segment; lateral abdominal border dentate, posterolateral corners with a strong tooth, especially on fourth to sixth segment. In male, pygophore not visible from dorsal side, ventrally partly visible, its ventral surface setose, with shallow median groove in posterior half. Lateral border of seventh segment distinctly dentate up to tip (Fig. 9).

***Prionolomia* Stal, 1873**

***Prionolomia gigas* Distant, 1879**

Material examined: 1 ♂, 1 ♀, India, Assam, Karimganj District, Bazaricherra, Makunda Christian Hospital Campus, on foliage, 18.iv. 2016, Rejoice Gassah and Vijay Anand Ismavel.

Redescription:

Measurements (in mm): Total length (measured from head to tip of abdomen): Male 40, female 38. **Male:** Length of antennal segments: I 10.5, II 6.5; III 6 mm; IV 10 mm; width at humeral angles 19; length of hemelytra 30; length of fore femur 11, fore tibia 9, fore tarsus 5; length of mid femur 13, mid tibia 11, mid tarsus 5; length of hind femur 16, hind tibia 16, hind tarsus 6.

Habitus and Coloration: Robust bug. Male dorsally dark brown, stout; ventrally paler with few scattered dark brown areas. Antennae overall brown, second and third segment darker apically, fourth segment much paler, almost yellow in basal part, slightly

darker beyond middle. Fore and mid legs light brown, and hind legs darker. Thoracic sterna laterally with broad ochraceous band. Scutellum dark brown but its apex ochraceous. Hemelytra dark brown; membrane with several longitudinal veins; hind wings long with transparent pale brown coloration; veins dark brown, raised. Abdominal tergites distinctly pink red, sterna a mixture of pale brown and yellow brown (Figs. 10-11). Female identical in coloration to male but dorsally as well as ventrally much paler (Figs. 12-13).

Morphology:

Male: Head quadrate, finely setose dorsally; eyes large, globular; ocelli prominent, pink with black ring on inner margin, closer to eye than to each other, preocellar groove deep, prominent. Antenniferous tubercles prominent, projecting in front of clypeus; antennae moderately stout, segment I longest and thick, II and III sub-equal, IV longer than second; III and IV subequal; all segments cylindrical, except fourth which is slightly flatter; head beneath finely setose; labium moderately long, stout, reaching anterior margin of midcoxae; bucculae distinct, pale coloured; clypeus and mandibular plates oblong oval, sloping, visible clearly in frontal view only.

Thorax: Pronotum appearing almost triangular due to laterally produced humeral region and very narrow anterior margin behind head; area in front of lateral projection strongly sloping, area behind more or less flat; anterior margin straight behind head; posterior margin straight over scutellum. Entire lateral margin of pronotum, up to tip of extended humeral angle, lined with strong, curved, black spines; posterior margin behind humeral angle also spinous, but spines shorter, rest of posterior margin smooth. Entire dorsal region with fine, pale brown setae. Callar area distinct, partly smooth without setae; behind callar area, entire pronotum rugulose, raised part of rugae shining and without setae; rugae indistinct on expanded portion of humerus; punctures very fine, distributed all over dorsal surface. Scutellum triangular with many transverse wrinkles and pale brown setae; lateral margin more or less straight. Prosternum

moderately concave in middle and transversely depressed all around; lateral margin rugulose, punctate all over, covered with pale brown setae; prosternal process produced sharply to meet similar sharp triangular anterior process of mesosternum; mesosternum distally pale coloured, median area moderately sulcate along length, with smooth shining patch on either side on disc; rest area with pale brown setae; mesosternum posteriorly rectangular meeting similar anterior part of metasternum, borders of both processes raised above like carina; metasternum darker, finely granular and densely setose all over; posterior margin gently concave. Lateral to all thoracic segments (pleural region) runs a dense band of mostly white and few pale brown setae, interspersed with brown smooth spots. Scent gland large, prominent, situated more ventrally, with rounded disc anteriorly and raised tubercle posteriorly at lateral border (Figs. 14-15). Scutellum triangular, as broad as long, with fine wrinkles all over.

Hemelytra: Clavus and corium dark brown, finely punctured and covered with patches of pale brown setae; veins distinctly raised above as ridges, smooth and shining; outer (anterior) angle very long, projecting beyond half-length of membrane; membrane moderately broad, exposing part of connexivum laterally and extending just to tip of last tergite.

All legs moderately stout and hind legs very stout. Fore and mid femora laterally compressed, carinate dorsally and ventrally, ventral carina terminating as prominent, long subapical spine; small spine present in front of this large spine. A few granules also present on femur, appearing as if forming a line on inner face; femoral carina also appears finely denticulate at some places. Fore and mid tibia strongly compressed with a median carina on inner face. Tarsus well developed, segment I long and stout, claws widely separated, black with well-developed, colorless, pulvillus at base. Entire surface of fore and mid legs covered with dark and pale brown setae and shorter adpressed setae. Hind femur strongly incrassate, almost spindle-

shaped with a series of strong, black, pointed, spiny tubercles arranged in apparent rows on inner as well as outer surface (inner row single, outer almost three rows); in addition, anterior surface with fine granules all over. As a distinct feature of male, there is a strong posteriorly directed spine ventrally beyond mid length. Hind tibia dilated on both sides, its inner dilation producing a sharp spine near middle, entire ventral margin finely denticulate proximal to this spine and strongly denticulate beyond spine up to tip; dorsal expansion only setose without denticulation and gently sinuate. Tarsi and claws as in fore and mid legs. Entire hind leg also covered with adpressed pale brown setae, margined with dark brown erect setae. Ventral expansion of tibia stronger, partly granular with less setae than dorsal margin.

Abdomen: Tergites relatively smooth, sternites covered with dense patches of pale brown setae; discal region of sternites rugulose, with fine tubercles and laterally coarsely punctured. Spiracles large, spiracular rim raised above, pale coloured; spiracles situated closer to anterior margin than lateral margin of segment. Seventh sternite truncate posteriorly in front of pygophore, its discal area strongly rugulose with sparse setae, exposed part of pygophore rounded, pygophore dorsally also covered by posterior rugulose extension of seventh tergite; dorsal opening not visible (Fig. 16). Lateral margin of connexivum finely granulose, posterolateral angles of segments III-VI produced into spine of which those on IV and V are very prominent.

Female: Abdominal sternites paler and abdomen distinctly broader than male. Hind legs similar, but femur less incrassate and without long ventral spines; dorsal surface with less number of tubercles; tibia similar but ventral margin not produced into median spine and with margin much finely denticulate than in male. Scutellum, clavus and corium distinctly mottled with paler patches. All antennal segments smaller by 0.5 to 1 mm than that of male. Seventh sternite in female emarginate at posterior border; median surface raised as a triangular projection with its tip above emargination. Female genital segments setose (Fig. 17).

DISCUSSION

Schroederia feana is a very distinct and the only species under this genus. It is quite different from species of the genus *Derepteryx* White (in which Distant had originally placed this species), such as *D. grayii* White, 1839 and *D. hardwickii* White, 1839 (now *Molipteryx hardwickii*); as pointed out by O'Shea and Schaefer (1980), the shape of the pronotum is diagnostic. Although, Distant described *S. feana*, no illustration was provided; later in Fauna volume Distant (1902) illustrated *D. grayii* only. It is true that the type locality of *S. feana* is in the adjacent country and its occurrence in India is not surprising, however it has never been reported from India before. Lack of surveys in these parts of North-East India may be one of the reason. A photo of syntype of this species has been provided by *Coreoidea Species File Online*.

Prionolomia gigas is similar to *Prionolomia heros* (Fabricius, 1794), which is also known from Sylhet in the adjoining region of Assam (presently in Bangladesh), as per Distant (1902), due to lateral ochraceous band on thoracic pleura, but the latter is a smaller species; both, the description and three figures provided by Distant leave no doubt that our species is *P. gigas*, however type material of both these species must be compared in future to find out other differences. *Prionolomia heros heros* has also been illustrated on *Coreoidea Species File Online* and appears distinct. The other two species described in Distant (1902) are smaller and lack thoracic sternal band. Although known from India, this species has also not been recently recorded in literature. Since these species are identifiable by characters and illustrations provided here for the first time, genitalia characters are not detailed here, besides these have been partly given by O'Shea and Schaefer (1980). Photos of pygophore, parameres and phallus of both species will be provided separately.

ACKNOWLEDGEMENTS

Thanks to Rejoice Gassah, Daniel Hmar and Ruphes Sakhrie for their support during field survey. Authors are grateful to Bill Dolling (UK) for his

continued support and to Prof. Dr. Mallik Malipatil (Australia) for his timely help. We also thank Coreoidea Species File Team of Natural History Museum, UK, for providing much useful links and photos of types on their website. Thanks are also due to the authorities of the Modern College, Pune, for facilities and encouragement.

REFERENCES

- Bredden G. (1900) *NovaStudiaHemipterologica*. Deutsche Entomologische Zeitschrift, Erstes Heft (S. 17-224): 161 – 185
- Coreoidea SF Team. *Coreoidea Species File Online*. Version 5.0. <http://Coreoidea.SpeciesFile.org> [accessed May 2016]
- Dispons P. (1962) Les Mictini asiatiques (Hem., Het., Coreidae). La lignée *Helcomeria*. Bulletin de la Société Royale des Sciences Naturelles du Laos 5: 28-44.
- Distant W.L. (1879) XIL.Hemiptera from the North-Eastern frontier of India. Annals and Magazine of Natural History (5) iii: 128-133
- Distant W. L. (1902) The Fauna of British India including Ceylon and Burma. Rhynchota Vol. I (Heteroptera). Taylor and Francis, London.pp.438
- Kulkarni S and Ghate H. (2016) First record of the thread-legged assassin bug *Myiophanes greeni* Distant, 1903 (Heteroptera: Reduviidae: Emesinae) from India. Biodiversity Data Journal 4: e7949. doi:10.3897/BDJ.4.e7949
- O’Shea R. and Schaefer C.W. (1980) A generic revision of the Asian and Australian Mictini (Heteroptera: Coreidae). Oriental Insects 14 (2): 221-251.
- Prabakar D. (2013) The Biogeographical distribution of species of the superfamily Coreoidea: Hemiptera in India. Records of Zoological Survey of India 113(4): 103-128.
- Schmidt E. (1911) DreineueCoreiden-Gattungen (Hemipt.). Deutsche Entomologische Zeitschrift 6: 565-571.

(Received 28 December 2016; revised ms accepted 15 April 2017; published 30 June 2017)