

REVIEW OF SPECIES OF *KURZENKOTILLA* LELEJ (MUTILLIDAE: MUTILLINAE) FROM INDIA

NITHYA CHANDRAN* AND DEBJANI DEY

Division of Entomology, National Pusa Collection,
Indian, Agricultural Research Institute, New Delhi - 110 012, INDIA
e-mail:nithyacr@yahoo.com

KEYWORDS

Taxonomy
Mutillidae
Mutillinae
Kurzenkotilla.

Received on :
13.01.2013

Accepted on :
27.02.2013

*Corresponding
author

ABSTRACT

Two species of the genus *Kurzenkotilla* Lelej (Mutillidae: Mutillinae: Mutillini) viz., species *niveosignata* André and *scrobiculata* Hammer are revised from India. The generic and species descriptions are updated through addition of taxonomic characters viz., shape, size, sculpture, setal orientation, morphometric ratios etc. These are supported by illustrations. In addition, annotated checklist and a key to the species are also provided.

INTRODUCTION

The "Mutillidae" is a large, cosmopolitan group of wasps, the classification of which has long been in a state of confusion. Mutillidae currently includes 208 genera and about 4200 described species worldwide under 10 subfamilies (Lelej, 2007; Lelej and Brothers, 2008) among which subfamily Mutillinae is the most dominant with four tribes. Many of the taxonomic issues in Mutillidae are common to all insect groups. Descriptions and diagnoses of more than half of Mutillidae are incomplete and inadequate for accurate identification (e.g. Schuster 1958, Casal 1969) as mutillids are marked by extreme sexual dimorphism. As velvet ants are marked by setal and integumental color patterns, consistent structural characteristics have been virtually ignored in favor of coloration for diagnosing species. Structurally important diagnostic features have not been effectively discussed and used for species diagnosis.

Eight genera have been reported from tribe Mutillini from the Oriental region among which six occur in India. Genus *Kurzenkotilla* was erected by Lelej (2005) with type species *Artiotilla ariana* Lelej. *Kurzenkotilla* is represented by 2 species from India. In the present investigation both the species of *Kurzenkotilla*, viz., *niveosignata* and *scrobiculata* have been redescribed to address the gaps in the existing knowledge by updating the available descriptions with diagnostic characters in a comprehensive manner. All the taxonomic characters of diagnostic importance have been illustrated and the keys have been modified for quick and authentic identification of the species. All these details have been brought to the fore in the present study so that it can form the basis for future studies.

MATERIALS AND METHODS

The base material for the study was from the National Pusa Collection (NPC), Division of Entomology, Indian Agricultural Research Institute, New Delhi. Some specimens collected during survey were also included in the studies. The genera are arranged in alphabetical order in the text. All the taxonomic characters were studied in intact specimens. In the present study the standard terminology followed, for description of sculpturing were of Harris (1979) and setae of Serna and Mackay (2010). Some specimens, particularly old which had become encrusted with dust were first relaxed in a moist chamber and then cleaned using a digital ultrasonic cleaner for a few seconds to minutes, depending on the specimen in water with a trace of detergent and then dried. The mandibles were stretched using minute pins. The general morphological characters were studied with Leica 10308700 and Leica M205FA stereobinoculars. Photographs were captured using Leica M205FA Stereozoom microscope. Illustrations were made using a drawing tube fitted with camera lucida, the scales of magnification are provided in the illustrations and further image processing was done by using adobe photoshop 9.

RESULTS AND DISCUSSION

Annotated Checklist (Table 1) Genus *Kurzenkotilla* Lelej, 2005.

Kurzenkotilla Lelej, 2004: 170. Type species: *Artiotilla ariana* Lelej, 1980.

niveosignata (André, 1894)

Mutilla niveosignata André, 1894 : 465 ♀ .

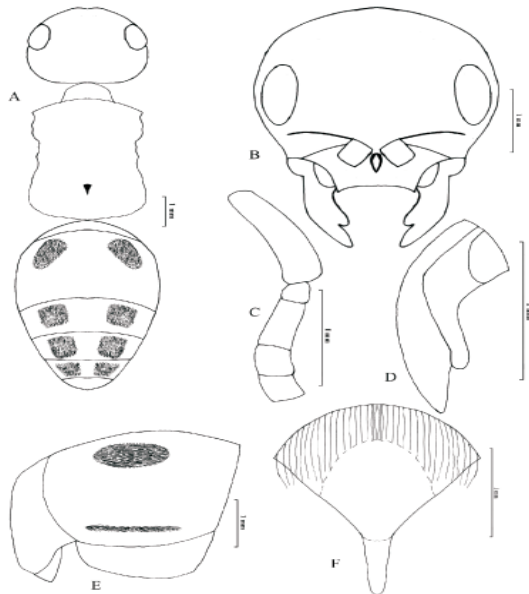


Figure 1: *Kurzenkotilla niveosignata* A, Habitus, dorsal view; B, Head, anterior view; C, pedicel and flagellomeres 1-3; D, mandible dorsal view; E, metasomal tergum I and II lateral view; F, pygidium, dorsal view. Scale = 1 mm

Distribution: Bihar*, Delhi*, Haryana*, Madhya Pradesh, Maharashtra, Orissa

scrobiculata (Hammer, 1962)

Mutilla scrobiculata Hammer, 1962: 4 ♂

Distribution: Himachal Pradesh, Uttarakhand*

Taxonomic Studies

Genus: *Kurzenkotilla* Lelej, 2005:170 (Gender: Feminine)
 Type species: *Artiotilla ariana* Lelej, 1980; designated by Lelej, 2005: 34.

Genus description: ♂ : Body length 9.98 - 12.45mm.

Head: Enlarged; subquadrate in dorsal view, slightly convex behind compound eyes; anterior portion convex and posterior margin almost straight; foveate reticulate. Eyes small oval. Malar space 0.8x LED. Scrobal carina well developed. Clypeus elevated at middle between antennal tubercles, anterior margin straight. Mandible stout, bidentate at apex, outer one larger than inner with blunt apex.

Mesosoma: Elongated rectangular; dorsal surface foveate reticulate but with larger and shallower cells than head, broader at pronotum and propodeum, slightly more at propodeal side, middle area slightly concave; Mesosoma without transverse propodeal row of denticles. Scutellar scale absent; mesosoma middle lateral side concave; pronotum and propodeum lateral sides similarly punctated as dorsal surface of mesosoma; mesopleura and metapleura impunctate. Propodeal face with abrupt declivity. Fore tarsi modified with well developed pectinate comb; mid and hind tibia with two rows of black spines, tibial spurs pectinate.

Metasoma: Ovoid; T1 wider than long, widest at TII, with feltline, length 0.6x length of tergum; SII disc dorso-laterally slightly flattened with middle raised, with sparse foveolations,;

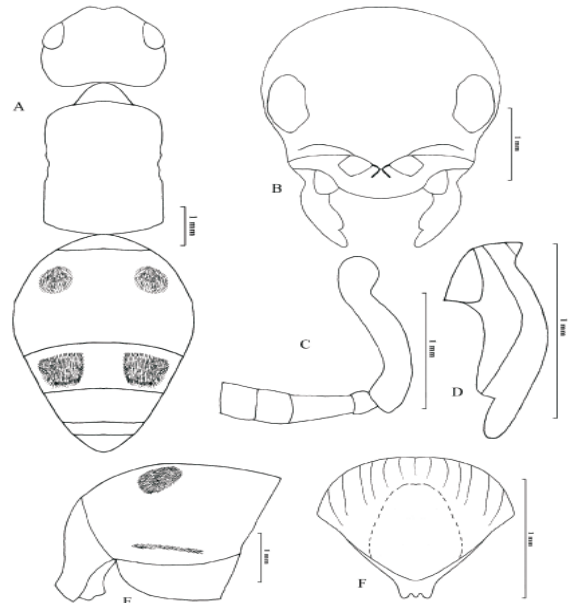


Figure 2: *Kurzenkotilla scrobiculata* A, habitus, dorsal view; B, head, anterior view; C, Pedicel and flagellomeres 1-3; D, mandible, dorsal view; E, metasomal tergum I and II lateral view; F, pygidium, dorsal view. Scale = 1mm

SI with a well developed blunt tooth; pygidium weakly developed without a well defined lateral carina, smooth shining and impunctate.

Key to species (♀): Mesosoma light brown with black margins, Metasoma black except T1 with golden yellow setae. Ratio of pedicel to flagellomeres 1 to 3 is 1: 0.3: 0.5: 0.5
niveosignata (André).

Mesosoma dark reddish brown, metasoma completely black. Ratio of pedicel to flagellomeres 1 to 3 is 1: 0.4: 0.8: 0.7.....
scrobiculata.

Species description

***Kurzenkotilla niveosignata* (André, 1894)**

(Fig. 1: A to F; Plate1: A to F

Kurzenkotilla niveosignata André, 1894:465, 480 [Syntype; PM]

Description: ♀ Body length 10.21-12.45mm.

Colouration: Head, antennae, lateral sides of mesosoma, legs, metasoma black. Clypeus, 2/3rd of mandible reddish brown, anterior margin of clypeus and apex of mandible black. Mesosoma dorsal surface light brown bordered by black margins. Head covered with erect sparse black setae; frons and vertex with moderately dense decumbent hairs; posterior margin of head with fringe of golden yellow setae; scape and pedicel above with sparse silvery white decumbent setae; FI above with sparse, decumbent, silvery white setae, intermixed silvery white micropubescence, remaining segments with silvery white dense micropubescence. Mesosoma dorsal surface with moderate dense, decumbent short golden yellow setae, dorsal surface and margins also with sparse short black erect setae; lateral sides of pronotum with sparse short silvery

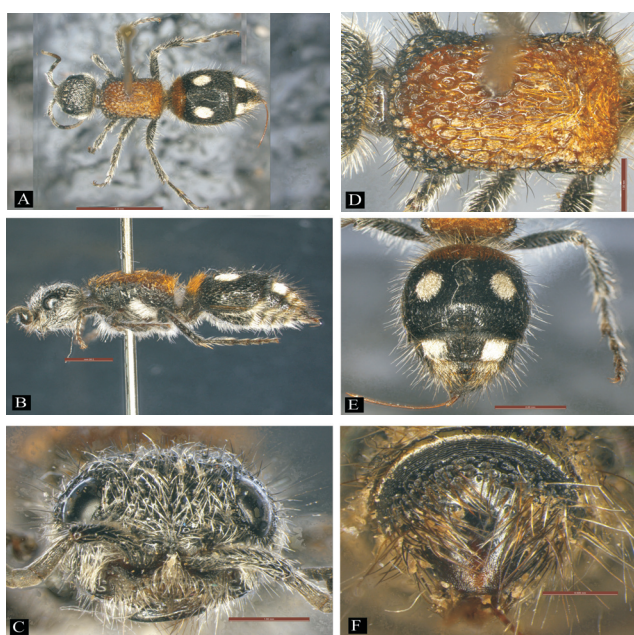


Plate 1: (A-F). *Kurzenkotilla niveosignata* A, B, Habitus; A, dorsal view; B, lateral view; C, Head anterior view; D, Mesosoma, dorsal view; E, Metasoma, dorsal view; F, pygidium, dorsal view.

white appressed setae; mesopleurae and metapleurae in the middle with a closely appressed spot of silvery white setae; propodeum lateral sides with sparse silvery white setae; legs with sparse to moderate dense silvery white, erect and semi erect setae; tibial and tarsal spines black and pale yellow. T1 above with closely appressed golden yellow setae; TII-TVI above with sparse, erect black setae, TII-TIV above with moderately dense closely appressed black setae; TII-TVI lateral margins with short, silvery white setae; TII on lateral sides with long felt line with dark brown closely appressed setae; TII on antero-lateral side with conspicuous oval spot with silvery white short setae; TIII on antero-lateral side with a square spot with dense silvery white setae; TIV also with similar spot but less dense setae; TV above with moderate dense silvery white setae; SII surface with sparse, silvery white erect setae; SII-SVI margins with short silvery white setae; pygidium anterior and lateral margins with intermix of brown, pale yellow closely appressed setae.

Head: Enlarged; quadrangular in dorsal view, slightly convex behind compound eyes; anterior portion convex and posterior margin almost straight; foveate reticulate. Eyes small oval. Malar space 0.8x LED. Scrobal carina well developed. Clypeus elevated at middle between antennal tubercles, anterior margin straight. Ratio of pedicel to flagellomeres 1 to 3 is 1: 0.3: 0.5: 0.5. Mandible stout, bidentate at apex, outer one larger than inner with blunt apex.

Mesosoma: Elongated rectangular; 0.8x longer than its maximal width; dorsal surface foveate reticulate but with larger and shallower cells than head, humeral area with small denticle, broader at pronotum and propodeum, slightly more at propodeal side, middle area slightly concave; scutellar scale absent; mesosoma middle lateral side concave; pronotum and propodeum lateral sides similarly punctated as dorsal surface of mesosoma; mesopleura and metapleura impunctate.

Propodeal face with abrupt declivity. Fore tarsi modified with well developed pectinate comb; mid and hind tibia with two rows of black spines, tibial spurs pectinate.

Metasoma: Ovoid; T1 foveate reticulate remaining tergites sparsely foveate; T1 wider than long, widest at TII, with feltline, length 0.6x length of tergum; SII disc dorso-laterally slightly flattened with middle raised, with sparse foveolations, remaining area irregularly rugose, remaining segments foveate reticulate; S1 with a well developed blunt tooth; pygidium weakly developed without a well defined lateral carina, smooth shining and impunctate.

Measurement (mm): Body length 11.51; pedicel length 0.16; F 1 length 0.52; F 2 length 0.30; F 3 length 0.29; longitudinal eye diameter 1.00; malar space 0.85; thorax width 2.87; thorax length 3.77; TII length 2.69; felt line length 1.57.

♂ : **Unknown**

Specimens examined: 1♀, INDIA: New Delhi: I.A.R.I, Ent. Div. 9.II.1953, Shama Coll., B., Petersen det. 1980; 2 ♀♀, Haryana: Hisar, 30.III.2012, Pavan coll.; Haryana: Hisar, 09.IX.2012, Nithya coll., 7 ♀♀, New Delhi: I.A.R.I, 8.VI.2012, Nithya coll.

Distribution: Bihar*, Delhi*, Haryana*, Madhya Pradesh, Maharashtra, Orissa.

Kurzenkotilla scrobiculata (Hammer, 1962)

(Fig. 2: A to F; Plate 2: A to F) *Mutilla scrobiculata* Hammer, 1962: 4 ♀. (Holotype; IMK)

Description: ♀ Body length 9.98 mm.

Colouration: Head, legs, metasoma black, mesosoma reddish brown. Clypeus and torulus reddish brown, apical margins of clypeus black; mandible reddish brown, apex and margins black. Head covered with sparse black erect setae, sparse closely appressed golden hairs on frons and vertex, moderately dense golden hairs on genae, clypeus above, below compound eyes, base of mandible, scape above with similar setae, remaining antennal segments covered with dense golden micropubesence; posterior margin of head with a fringe of golden setae. Mesosoma dorsal surface with long erect black setae intermixed with sparse decumbent black setae, posterior and posterior lateral sides with long erect golden setae; lateral sides of pronotum, pleural region and sides of propodeum with sparse, golden, decumbent hairs; legs with sparse long erect setae to denser setae towards tarsi. T1 covered with sparse erect golden setae intermixed with closely appressed black setae, latero-apical margins with two spots of dense golden setae, latero-apical margins of T1-TVI with thick golden setae, TII-TVI with closely appressed black setae; TII dorsal medio-laterally with two round short spots with golden rich pubescence; TIII dorso laterally with two square spots rich in golden pubescence; SII with sparse erect golden setae; TII on lateral margins with a long felt line of closely appressed golden setae.

Head: Enlarged; subquadrate in dorsal view, slightly convex behind eyes, anterior margin convex, posterior margin slightly concave, area behind eyes convex, postero-lateral margin of head rounded; foveate reticulate. Eyes small, oval. Malar space 0.8x LED. Scrobal carina well developed reaching above torulus. Clypeus middle region elevated with small tubercles, median region between antennal tubercles with short inverted

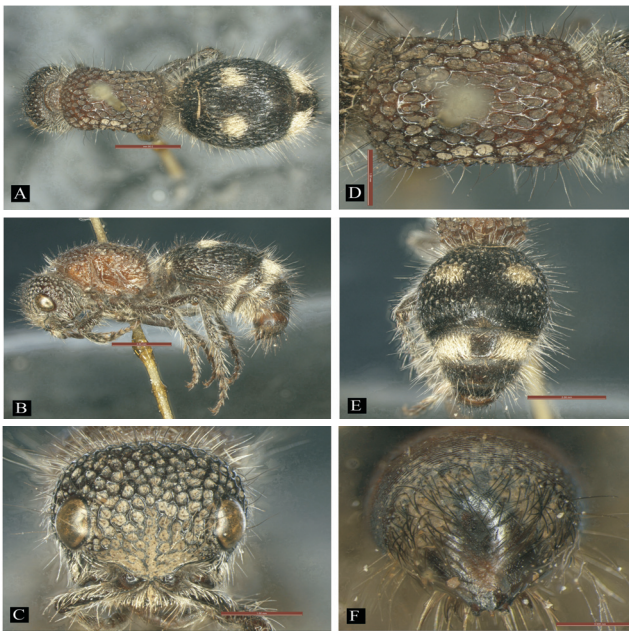


Plate 2: (A-F). *Kurzenkotilla niveosignata* A, B, Habitus; A, dorsal view; B, lateral view; C, Head anterior view; D, Mesosoma, dorsal view; E, Metasoma, dorsal view; F, pygium, dorsal view

V-shaped carina, anterior margin slightly curved towards outside. Ratio of pedicel to flagellomeres 1 to 3 is 1:0.4:0.8:0.7. Mandible short, stout, bidentate at apex, with blunt ends and inner tooth smaller than outer one.

Mesosoma: Elongated rectangular, 0.7x longer than its maximal width; broader at pronotal and propodeal sides, slightly more widened at propodeal sides, sides slightly concave; Mesosoma dorsal surface foveate reticulate with larger cells, pronotal lateral sides and propodeal lateral sides similarly punctated, meso and metapleura impunctate smooth and shining; Scutellar scale absent; humeral area without denticle. Propodeum posterior face with abrupt declivity. Fore tarsi modified with well developed pectinate comb; mid and hind tibia with two rows of stout spines, tibial spurs pectinate.

Metasoma: Ovoid; conspicuously wider than mesosoma, T1 wider than long, TII with feltline, length 0.6x length of tergum; T1 densely foveolate, TII foveate reticulate with elongated

cells, TIII-TV foveate reticulate with intermix of smaller to larger cells, SI with a medium sized blunt tooth; SII slightly flattened on disc dorso laterally and bordered by lateral carina at the base with sparse foveolations; pygidium smooth and shining with out a well defined lateral carina.

♂ : Unknown

Measurement (mm): Body length 9.98; pedicel length 0.18; F 1 length 0.55; F 2 length 0.24; F 3 length 0.24; longitudinal eye diameter 0.90; malar space 0.74; thorax width 2.38; thorax length 3.21; TII length 2.31; felt line length 1.47.

Specimens examined: 1♀, INDIA: Uttarakhand: Kumaon, Bhim Tal, 4500ft, 20.VIII. 1908, Fletcher coll., B.Petersen det. 1980.

Distribution: Himachal Pradesh, Uttarakhand*.

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