

Holotype ♂, INDIA : ORISSA, Keonjhar, Baigonpal Forest, 30.iii.1973, S.K. Gupta and party, at light. Aedeagus dissected and mounted on slide; Paratypes 40 ex., data same as holotype (in Zoological Survey of India, Calcutta).

Distribution : INDIA : Orissa.

Genus Monanus Sharp

Monanus Sharp, 1879, Trans. ent. Soc. London 2 : 85;

Sharp and Scott, 1913, Fauna Hawaii 3 : 429;

Grouvelle, 1912, Annls Soc. ent. Fr. 81 : 344.

Emporius Ganglbauer, 1899, Die Käfer Von Mitteleuropa

3 : 429; Grouvelle, 1908, Annls Soc. ent. Fr. 77 : 489.

Type-species : Monanus crenatus Sharp

This genus was established by Sharp (1879) for his species Monanus crenatus from Hawaii Is. and placed the genus between Psammoecus Latreille and Telephanus Erichson. Ganglbauer (1899) described Emporius for the species Silvanus signatus Frauenfeld and he attributed this genus to the sub-family Silvaninae under the family Cucujidae. Reitter (1911) referred Emporius to the tribe Psammoecini. Sharp and Scott (1913) synonymised Emporius with Monanus. Grouvelle (1912) dealt Monanus finally in the tribe Silvanini and subdivided the genus

into two subgenera Monanus and Monanops. Hetschko (1930) catalogued twentyone species under Monanus, of which only M. longicornis (Grouvelle) is recorded from South India (Malabar) and M. concinnulus (Walker) listed as cosmopolitan. This genus is predominant in Oriental region and also recorded from Australia, United States, and Hawaii Is. In the present study M. concinnulus is found to be the most common species and recorded almost throughout in India.

Subgenus Monanus (s.str.)

Monanus (Monanus) Grouvelle, 1912, Annls Soc. ent. Fr.

81 : 352.

Definition :

General appearance (Fig. 157) elongated, moderately depressed, yellowish to reddish brown and sometimes with black spots on elytra.

Head (Fig. 162) about as long as broad, front margin of clypeus almost straight, eyes moderately large and coarsely faceted, temple flattened beneath eye and shelf-like, transverse impressed line on vertex behind eyes absent, tentorium with two long tentorial arms connected by a transverse bridge. Antenna moderately long and slender, antennal insertions hidden under projection of frons, 11-jointed, scape broadly elongated,

joints 2-8 subequal and smaller, club loose and 3-jointed. Mandible elongated, right mandible (Fig. 170) with 3 apical teeth and left mandible (Fig. 169) with an additional blunt tooth beneath apical teeth. Maxilla (Fig. 171) with lacinia narrow and elongated and without apical spine; galea elongated, broad and its apex densely hairy; palpi with segments 2 and 3 almost equal, apical segment longest and fusiform. Labium (Fig. 172) with mentum somewhat triangular and transverse, apical segment of palpi slightly longer than segment 2 and fusiform. Labrum (Fig. 173) with apical margin slightly curved inwardly.

Prothorax (Fig. 163) about as long as broad, lateral margins denticulate, front coxae contiguous, cavities broadly closed behind externally as well as internally, prosternal process broad at apex and its apical margin almost straight, sterno-pleural suture extending to anterior denticle.

Meso-metathorax (Fig. 165) : Mesocoxae contiguous, cavities broadly opened outwardly, lateral margins of mesosternal process notched near posterior two-third, sternal fitting between mesocoxae almost in a straight line. Metasternum transverse, median impressed line extends anteriorly near apex of mesosternal process, hind coxae widely separated. Metendosternite simple and represented by two appophyses.

Wing and Elytra : Wing (Fig. 168) with single anal vein and radial cell, without anal cell and subcubital fleck. Elytra somewhat ovoid, each elytron (Fig. 167) with 9 rows of strial punctures, without scutellary striole, alternate interstices with single and double rows of pubescence, epipleura narrow and complete up to apex.

Legs (Fig. 164) moderately long, trochanters simple and slightly broadly elongated, femora swollen towards middle, tibiae not broadened at apex and with two apical spurs; tarsal formula 5-5-5 in both sexes, tarsal segment 1 elongated, segments 2 and 3 strongly lobed below, segment 4 shortest, claws simple.

Abdomen (Fig. 166) elongated, ventrite 1 longest, intercoxal process broad and its apex slightly rounded, femoral lines closed, ventrites 2-5 subequal. Aedeagus (Fig. 174) with median lobe broad, median sturt elongated and its apex spatulate; parameres well-developed, slender and elongated and with a few setae at apex. Ovipositor (Fig. 175) with well-developed paraprocts, valvifers, coxites, and styli attached on outer margin of apex of coxites.

Habitat : Haystack and vegetable garbage.

Distribution : India, Sri Lanka, Indonesia, Malaysia, Singapore, Philippines, Seychelles, Japan, Australia, New Guinea, United States, Hawaii Is.

KEY TO THE SPECIES OF MONANUS (S.STR.) FROM INDIA

1. Elytra with a transverse black spot near middle; antenna moderately long, shorter than length of head and prothorax together; pubescence short.

..... concinnulus (Walker)

Black spot on elytra absent; antenna long, longer than length of head and prothorax together and extends upto half of length of body; pubescence long. ...

..... longicornis (Grouvelle)

36. Monanus (Monanus) concinnulus (Walker)

Monotoma concinnulus Walker, 1858, Ann. Mag. nat. Hist.

(3) 2 : 207 (Type-loc. : Sri Lanka).

Silvanus signatus Frauenfeld, 1867, Verh. zool.-bot. Ges.

Wien 17 : 438.

Cryptomorpha fasciatus Wollaston, 1874, Entomologist's

mon. Mag. 10 : 169; Waterhouse, 1876, Entomologist's

mon. Mag. 13 : 122.

Cathartus fascipennis Reitter, 1876, Col. Hefte 15 : 129.

Emporius signatus (Frauenfeld): Ganglbauer, 1899, Die Käfer

von Mitteleuropa 3 : 586; Reitter, 1911, Fauna

Germanica 3 : 48.

Emporius concinnulus (Walker): Grouvelle, 1908, Annls Soc.

ent. Fr. 77 : 489.

Monanus (Monanus) concinnulus (Walker) : Grouvelle, 1912,

Annls Soc. ent. Fr. 81 : 371.

This species so far remains unrecorded from India.

M. concinnulus is one of the most common species of Indian Silvanidae. This is a fast-moving species and distinct transverse black median spot on elytra is the most conspicuous character for recognising this species in the field.

General appearance (Fig. 157) elongated, moderately depressed, rather shiny, yellowish brown to reddish brown and usually with black markings on elytra; covered with short, semierect, golden pubescence.

Head : Exposed part of head wider than long, eyes large and coarsely faceted, eyes shorter than one-third of length of head, temple about as long as 1.5 eye facets and its outer apical angle slightly pointed, puncturation on vertex coarse and dense and that of towards anterior margin of clypeus slightly finer, setae short and projected towards middle line. Antenna moderately long and slender, scape moderately large, pedicel and joint 3 about as long as scape and slightly narrower, joints 4-8 subequal and shorter than joint 3, joint 9 about as long as broad, joint 10 slightly transverse and joint 11 slightly elongated. Prothorax about as long as broad, convex, anterior margin outwardly curved, lateral margin with ten small and blunt denticles and each denticle bears an anteriorly directed seta, puncturation on pronotum coarse and dense and similar to that of vertex of head. Scutellum moderately large, transverse

and pubescent. Elytra slightly less than two times as long as broad, lateral margins almost uniformly curved, a transverse black spot near middle and that extends towards apex along suture, rows of punctures large, setae projected posteriorly. On ventral side puncturation finer than on dorsal side. Aedeagus (Fig. 174) with parameres elongated, each paramere with an apical long and two short setae.

Measurements : Total length 1.60-2.35 mm, width of head across eyes 0.35-0.47 mm, length of antenna 0.58-0.76 mm, width of prothorax across middle 0.38-0.54 mm, length of elytra 1.05-1.46 mm and width across middle 0.55-0.76 mm.

Materials examined : 438 ex. INDIA : ASSAM, Phulbari, 6 ex., 24.xi.1974, T. Sengupta, leaf garbage; WEST BENGAL, Darjeeling dist. Sukna, 5 ex., 5.v.1976, T.K. Pal, haystack; Calcutta, 1 ex., 6.viii.1950, A.P. Kapur, at light; 1 ex., 1.xi.1974, T.K. Pal, at day light; 24 Parganas dist. Sagar Island, 50 ex., 24.iii.1975, T.K. Pal, haystack; Diamond Harbour, 100 ex., 25.iii.1975, T.K. Pal, haystack; Howrah dist. Sankrail, 250 ex., iii.1975-x.1975, T.K. Pal, haystack; Howrah dist. Ranihati, 2 ex., 11.v.1975, T.K. Pal, haystack; BIHAR, Chaibasa, 5 ex., 19.x.1977, T. Sengupta, haystack; UTTAR PRADESH, Pantnagar, 2 ex., 24.iii.1972, T. Sengupta, haystack; Anandnagar, 25 Km from Lachmipur, 3 ex., 9.x.1976, T. Sengupta, haystack; DELHI, 2 ex., 12.v.1972, T. Sengupta, haystack of Jower; TAMIL NADU, Anaimalai hills, 550 m, 1 ex., 17.xi.1972, Besuchet Löbl Mussard; KARNATAKA, Bangalore, 10 ex., 10.xii.1972, T. Sengupta, haystack.

Distribution : INDIA : Assam, West Bengal, Bihar, Uttar Pradesh, Delhi, Tamil Nadu and Karnataka. Outside India this species has a wide distribution and recorded from both the Old and New World.

37. Monanus longicornis (Grouvelle)

Silvanus longicornis Grouvelle, 1892, Annls Soc. ent. Fr.

61 : 285 (Type-loc. : Singapore, Philippines).

Emporius longicornis (Grouvelle) : Grouvelle, 1902,

Annls Soc. ent. Fr. 71 : 484; Grouvelle, 1908,

Annls Soc. ent. Fr. 77 : 489.

Monanus (Monanus) longicornis (Grouvelle) : Grouvelle,

1912, Annls Soc. ent. Fr. 81 : 371.

Grouvelle (1908) recorded this species from South India (Malabar). This species is near to M. concinnulus (Walker) but can be distinguished by its elytra without any black spot, antenna long and longer than length of head and prothorax together, elytra parallel-sided, lateral margin of prothorax with eight small denticles, puncturation of head and prothorax coarser, and pubescence long.

General appearance (Fig. 159) elongated, moderately depressed, rather shiny, reddish brown; covered with rather long, semierect golden pubescence.

Head : Exposed part of head wider than long, eyes large and coarsely faceted, eyes about half as long as head, temple about as long as one eye facet and its outer apical angle somewhat broad, puncturation on vertex coarse and moderately dense and that of towards anterior margin of clypeus slightly finer, setae long and projected towards middle line. Antenna rather long and slender, scape moderately large, pedicel and joint 3 about as long as scape and slightly narrower, joints 4-8 subequal and shorter than joint 3, joint 9 about as long as broad, joint 10 slightly transverse, joint 11 slightly elongated.

Prothorax about as broad as long, convex, anterior margin outwardly curved, maximum width in anterior half and slightly narrowed posteriorly, lateral margin curved with eight small denticles and each denticle bears an anteriorly directed seta, puncturation on pronotum coarse and moderately dense and similar to that of vertex of head. Scutellum moderately large, transverse and pubescent. Elytra about two times as long as broad, almost parallel-sided, rows of punctures large. On ventral side puncturation finer than on dorsal side.

Measurements : Total length 2.02 mm, width of head across eyes 0.55 mm, length of antenna 0.88 mm, width of prothorax across middle 0.55 mm, length of elytra 1.29 mm and width across middle 0.69 mm.

Material examined 1 ex., Locality and other data not given (brought from Mus. Nat. Hist. Nat., Paris on loan)

Distribution : INDIA : Kerala (Malabar); SINGAPORE; PHILIPPINES; INDONESIA.

Subgenus Monanops Grouvelle

Monanus (Monanops) Grouvelle, 1912, Annls Soc. ent. Fr.

81 : 344.

Grouvelle (1912) included the species Monanus albertisii (Grouvelle) (New Guinea, Sumatra), M. telephanoides Grouvelle, (Sumatra), M. bouchardi Grouvelle (Sumatra), M. longipennis Grouvelle (Sumatra) and M. insolitus Grouvelle (Sumatra) under the subgenus Monanops. A study of detailed morphological characters has shown that Grouvelle's subgenera of Monanus may be given generic rank. But no attempt has been made to establish a separate genus in the present study. The chief differences of this subgenus with Monanus (s.str.) are given below :

<u>MONANUS</u>	<u>MONANOPS</u>
1. Size smaller (1.60-2.35 mm)	1. Size larger (about 3.50 mm)
2. Elytra ovoid and hardly twice as long as wide	2. Elytra parallel-sided and two and half times as long as wide
3. Prothorax distinctly narrower than elytra (1.00 : 1.38 to 1.42)	3. Prothorax slightly narrower than elytra (1.00 : 1.15)

MONANUS	MONANOPS
4. Transverse impressed line on vertex of head behind eyes absent	4. Transverse impressed line on vertex behind eyes present
5. Head and prothorax about as broad as long	5. Head and prothorax elongated
6. Sterno-pleural suture of prothorax extending to anterior denticle	6. Sterno-pleural suture of prothorax extending to lateral margin and far below anterior denticle
7. Front coxae and mesocoxae contiguous	7. Front and mesocoxae narrowly separated
8. Intercoxal process of ventrite 1 broad and broadly pointed at apex	8. Intercoxal process of ventrite 1 narrow and narrowly pointed at apex
9. Elytral epipleura extended upto apex	9. Elytral epipleura terminates before apex.

This subgenus so far remains unrecorded from India, and in the present study this is first time recorded with a new species from Darjeeling district of West Bengal.

Definition :

General appearance (Fig. 160) elongated, rather parallel-sided, flat and reddish brown.

Head (Fig. 176) elongated, front margin of clypeus almost straight, eyes moderately large and coarsely faceted, temple

flattened beneath eye and slightly shelf-like, transverse impressed line on vertex behind eyes present, tentorium with two long tentorial arms and connected by a transverse bridge. Antenna moderately long and slender, antennal insertions hidden under projection of frons, 11-jointed, scape broadly elongated, pedicel and joint 3 slightly shorter and narrower than scape, joints 4-8 shorter and subequal, club loose and 3-jointed. Mandible (Fig. 183) with 3 apical teeth, mola well-developed, no trace of dorsal mandibular cavity near base. Maxilla (Fig. 184) with lacinia narrow and elongated and without apical spine; galea short, broad and its apex densely hairy; palpi with segments 2 and 3 nearly equal, apical segment longest and fusiform. Labium (Fig. 185) with mentum somewhat triangular and transverse, palpi with segment 2 and apical segment nearly equal in length and apical segment fusiform. Labrum (Fig. 186) with apical margin slightly curved outwardly.

Prothorax (Fig. 177) elongated, lateral margins with few small denticles, front coxae narrowly separated, cavities broadly closed behind externally as well as internally, prosternal process broad at apex and its apical margin straight, sterno-pleural suture extending to lateral margin.

Meso-metathorax (Fig. 179): Mesocoxae narrowly separated, cavities rather narrowly opened outwardly, lateral margins of mesosternal process notched behind middle, sternal fitting

between mesocoxae almost in a straight line. Metasternum transverse, median impressed line extends upto anterior one fourth, Metendosternite simple and represented by two appophyses.

Wing and Elytra : Wing (Fig. 182) with single anal vein and radial cell, without anal cell and subcubital fleck. Elytra rather parallel-sided, each elytron (Fig. 181) with 9 rows of striae punctures, without scutellary striole, interstices pubescent, epipleura narrow and extended near apex.

Legs (Fig. 178) moderately long and slender, trochanters short and simple, femora swollen towards middle, tibiae not broadened at apex and with two apical spurs; tarsal formula 5-5-5, segment 1 slightly elongated, segments 2 and 3 strongly lobed below, segment 4 shortest, claws simple.

Abdomen (Fig. 180) elongated, ventrite 1 longest, intercoxal process narrow and narrowly pointed at apex, femoral lines closed, ventrites 2-5 subequal. Aedeagus (Fig. 187) with median lobe rather short and broad and slightly tapered at apex, median sturt long and slightly spatulate at apex; parameres well-developed, slender and elongated and with long apical seta.

Habitat : In the present study the species has been collected from bamboo (Bambusa aurandaceae) leaf sheath.

Distribution : India, Indonesia (Sumatra), New Guinea.

38. Monanus (Monanops) himalayicus sp.nov.

This species is closely related to Monanus (Monanops) bouchardi Grouvelle but can be differentiated by its prothorax being widest at anterior one-third (at middle in bouchardi), puncturation of head denser and the species larger in size.

General appearance (Fig. 160) elongated, flattened, slightly shiny, uniformly reddish brown; covered with short, semierect, golden pubescence.

Head : Exposed part of head wider than long, eyes large and coarsely faceted, length of eye distinctly shorter than half of length of head, length of temple about as long as 2-2.5 eye facets and its outer apical angle broad, puncturation on vertex coarse and dense and that of towards anterior margin of clypeus slightly finer. Antenna moderately long and slender, scape moderately large, pedicel and joint 3 slightly shorter and narrower than scape, joints 4-8 subequal and shorter than joint 3, joints 9 and 10 about as broad as long and joint 11 slightly elongated. Prothorax slightly elongated, widest near middle, anterior angle with a short and broad spinous projection; lateral margin rounded and slightly sinuate before posterior angle, with ten denticles; lateral depressions on pronotum slightly developed, puncturation on pronotum coarse and dense and similar to that of

vertex of head, setae short and projected towards middle line. Scutellum moderately large, transverse and pubescent. Elytra more than two times as long as broad, rather parallel-sided, lateral margins wavy and slightly explanate, rows of punctures moderately large, interstices about as broad as width of each puncture. On ventral side puncturation sparser than on vertex and pronotum. Aedeagus (Fig. 187) with median lobe slightly tapered at apex, each paramere with a long apical seta and a shorter seta above apex.

Measurements of holotype : Total length 3.47 mm, width of head across eyes 0.58 mm, length of antenna 1.02 mm, width of prothorax across middle 0.70 mm, length of elytra 2.23 mm and width across middle 0.92 mm.

Holotype 1 ex. and Paratypes 6 ex., INDIA : WEST BENGAL, Darjeeling dist., Rambh, 6.i.1974, Srivastava and Maity, Bambusa aurandaceae leaf sheath. One Paratype mounted on slide. (in Zoological Survey of India, Calcutta).

Distribution : INDIA : West Bengal (Darjeeling district).