

A new reclassification of the family Chelisochidae (Dermaptera)

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Abstract — A subfamilial and generic classification *Chelisochidae*, based on a consistent grouping of the characters of male genitalia are given in keys suitable for identifying world genera and subfamilies.

A very distinct and characteristic group of the *Dermaptera*. Generally dark and often black earwigs. A common and very characteristic feature is the peculiarly developed middle tarsomere (tarsomeron mediale), bearing an obtuse process, clearly extending and accumbent below the ventral surface of the last tarsal joint, quite indiscernible from above. In a lateral view, it is also very distinct, longer, and occasionally multiply longer than the joint itself.

The most highly developed group of the forficuloid-type *Eudermaptera*. Body more slender, legs longer, wings well developed or absent. The majority of the species has a cylindrical and only slightly flattened body. A common character is the male paramere possessing on the apical surface one genital (or distal) lobe with included virga in most species. Base of virga either with a basal vesicle or without one.

The systematic position of the *Chelisochidae* presents a number of problems. The original classification of the earwigs by VERHOEFF (1902), and ZACHER (1911) placed it near the *Labiidae* and *Forficulidae* but the revision of the general systematics of the order by POPHAM (1965), and STEINMANN (1975) placed the *Chelisochidae* as a separate family in the *Eudermaptera* showing parallel trends of evolution towards the possession of the single penis lobe, with those of the *Forficulidae*. The *Chelisochidae* resemble the *Allostethinae* (family *Labiduridae*) in having acuminate external parameres in the male genitalia. If this feature is a primitive one, then it implies that the *Chelisochidae* became separate from the main forficuloid stock at an early stage, possibly soon after the development of the reniform vesicle at the base of the virga.

IDENTIFICATION KEY TO THE SUBFAMILIES

- 1 (2) Entirely apterous. Male genitalia undeveloped, not of Chelisochid-type; genital lobes present or absent, but distal lobe without virga. Only one Indian species

Genitalatinae subfam. n.

- 2 (1) Tegmina and wings present; tegmina short, wings abortive, or tegmina and wings normally developed. Male genitalia well developed, genital lobe prominent.

- 3 (4) Lateral margins of tegmina with a ridge-like keel, occasionally not extending along entire segment. Antero-lateral angles of pronotum more or less elongate. Forceps robust, mostly thickened, inner margins dentate. Oriental species

Chelisochellinae STEINMANN, 1975

- 4 (3) Lateral margins of tegmina without a ridge-like keel. Body of extremely varying shape and with considerable sexual dimorphism, even a number of species displaying a certain range of individual (or subspecific?) variation. Tibia smooth or striated, nearly reaching end of abdomen, or shorter and extending only to half its length. Forceps highly varying; short and simple, or elongate, serrately dentate on their inner

Annls hist.-nat. Mus. natn. hung., 79, 1987

margins along a short or a longer section. Anterior margin of external paramere of male genitalia strongly constricted or normal. Distribution everywhere except the American continent

Chelisochinae BURR, 1907

Genitalatinae subfam. n.

Totally apterous; moderately large and slender species. Antennae multisegmented, about 36-jointed; third antennal joint long, slender and nearly as long as joints 4–6 combined. Pronotum narrower than head, slightly widened posteriorly. Legs long and slender, first tarsal segment longer than the 2nd and 3rd combined; second produced into a small lobe below the 3rd. Abdomen slender, elongated, and parallel-sided. Ultimate tergite short and transverse. Pygidium very small. Forceps contiguous, long and slender. Penultimate sternite ample, and broadly rounded. Male genitalia very characteristic, undeveloped; central parameral plate broad, genital lobe present, but very simple, with a narrow median incision; distal lobe without virga. External parameres broad and elongated, nearly of equal width throughout, apex slightly narrowed towards inner margin.

Type-genus: *Genitalata* KAPOOR, 1974

Species: *mahajani* KAPOOR, 1974 (India: Himahar Pradesh).

Chelisocheinae STEINMANN, 1975

Lateral margins of tegmina with a ridge-like keel, sometimes not extending along entire segment. Tegmina dilated, broad and ample or square, truncate. Postfrontal and coronal sutures deep, well marked or feeble. Male forceps more or less well developed, broader or narrower basally, inner margins with smaller or larger tooth or teeth. Male genitalia of *Chelisoche*-type, with a very long virga, and base of virga with two sclerotized sacs.

Type-genus: *Chelisoche* VERHOEFF, 1902.

IDENTIFICATION KEY TO THE GENERA

- 1 (2) Body length usually over 12 mm. Tegmina dilated, broad and ample. Antennal joints 4 and 5 equally long, together longer than third. Head tumid, postfrontal and coronal sutures deep, well marked. Tegmina powerful, wings long and prominent. —
Type-species: *Lobophora superba* DOHRN, 1865.

Species: *doriae* (BORMANS, 1900) (Sikkim, and Borneo), *superba* (DOHRN, 1865) (Oriental Region)

Chelisoche VERHOEFF, 1902

- 2 (1) Body length not more than 12 mm. Tegmina square, truncate, short; wings abortive. Antennae with third joint relatively short; fourth cylindrical, a little shorter; fifth about equal to third. Head smooth, postfrontal and coronal sutures feeble. — Type-species: *Chelisoche punctulata* BURR, 1897.

Species: *mounseyi* BURR, 1916 (Philippine Islands: Mindanao), *punctulata* (BURR, 1897) (Celebes), *significans* STEINMANN in print (Sulawesi), *weneri* SRIVASTAVA, 1878 (Philippine Islands: Mindanao)

Kinesis BURR, 1907

Chelisochinae BURR, 1907

Lateral margins of tegmina without a ridge-like edge. Tegmina short, posterior margins obliquely truncate, and wings absent, or tegmina well, sometimes fully developed, and wings present. Head normally developed, postfrontal and coronal sutures well marked or indistinct. Tibiae not obviously

flattened laterally, or sulcate or flattened only at extreme apex, or tibiae sulcate or flattened at least in distal 1/4. Male genitalia normally developed, with a distal lobe, and external parameres varying.

Type-genus: *Chelisoches* SCUDDER, 1876.

IDENTIFICATION KEY TO THE GENERA

- 1 (8) Tibiae not obviously furrowed, flattened laterally.
 2 (3) Tarsi long and slender together about as long as the width of pronotum. Antennae with 20 joints; third joint long, but shorter than the joints 4 and 5 combined. Head tumid, postfrontal and coronal sutures distinct. Male forceps ample, stout, depressed and broad; those of female elongate and less stout. — Type-species: *Chelisoches shelfordi* BURR, 1900.

Species: *dravidius* BURR, 1910 (South India), *glaucopterus* (BORMANS, 1888) (India, Burma, Vietnam, South China), *metallicus* SRIVASTAVA, 1985 (India), *nigrocastaneus* BURR, 1910 (India), *proreoides* RAMAMURTHI, 1967 (New Britain), *shelfordi* (BURR, 1900) (Oriental, Region), *tenebrator* (KIRBY, 1891) (India)

Adiathetus BURR, 1907

- 3 (2) Tarsi shorter than the width of the pronotum.
 4 (5) Body strongly depressed. Antennae with fourth joint scarcely longer than broad; fifth joint about equal to the sixth. Head smooth, depressed. Tegmina and wings ample, smooth. — Type-species: *Mecomera kervillei* BURR, 1905 (India, Java)

Lamprophorella BURR, 1911

- 5 (4) Body not strongly depressed.
 6 (7) Head depressed, postfrontal and coronal sutures indistinct; occiput tumid on each side. Tegmina and wings well developed. Male forceps depressed, arcuate. The genus is Oriental and Australian in distribution together with some records from some Pacific islands. — Type-species: *Chelisoches feae* BORMANS, 1894.

Species: *bidentatus* RAMAMURTHI, 1965 (South India), *crassus* BORELLI, 1926 (Mindoro), *dohertyi* (BURR, 1899) (Celebes and South India), *feae* (BORMANS, 1894) (Burma, Malaysia, New Guinea, Sumatra, New Zealand, Borneo, Java, Vietnam, South-Western China), *fletcheri* (HEBARD, 1923) (India), *fuscus* (BORELLI, 1927) (Sumatra), *kempi* BURR, 1913 (India), *kozlovi* SEMENOV et BEY-BIENKO, 1934 (Central Mongolia, China), *melanocephalus* (DOHRN, 1865) (India, Burma, Vietnam, Java), *nigrorufus* (BURR, 1902) (New Guinea, Society Islands, Hawaii, Tahiti, Bismarck Islands, Solomon Islands, Philippine Islands), *pusillus* (BORELLI, 1918) (Philippine Islands), *semiluteus* (BORMANS, 1899) (Java), *singhi* KAPOOR, 1966 (Himalayas), *tenebrosus* BRINDLE, 1968 (Philippine Islands: Siargao), *varicornis* (BORMANS, 1903) (Celebes), *versicolor* BORELLI, 1923 (Philippine Islands: Luzon, Mindanao, Mindoro), *werneri* SRIVASTAVA, 1978 (Philippine Islands)

Hamaxas BURR, 1907

- 7 (6) Head smooth, postfrontal and coronal sutures present. Tegmina and wings well developed. Male forceps short, arcuate, swollen at base, inner margins at base with indistinct denticles. — Type-species: *Sphingolabis variegata* KIRBY, 1891.

Species: *boesemani* STEINMANN, 1981 (Sumatra), *elegans* (BORMANS, 1900) (Sumatra, Java), *simplex* RAMAMURTHI, 1967 (New Britain), *variegatum* (KIRBY, 1891) (Sierra Leone, Ghana, Cameroon, South Nigeria, French Congo, Angola, Sumatra and Java — after POPHAM 1968)

Euenkrates REHN, 1927

- 8 (1) Tibiae sulcate or flattened only at extreme apex, or at least in distal 1/4.
 9 (14) Tibiae sulcate or flattened only at extreme apex.
 10 (11) Tegmina short, posterior margins obliquely truncate; wings absent. Male forceps undulate and each branch with 3 teeth. Female forceps with long, slender branches.

External parameres of male genitalia widest distally. — **Type-species**: *Tauropygia tridentata* BRINDLE, 1970 (Solomon Islands)

Tauropygia BRINDLE, 1970

11 (10) Tegmina longer, posterior margins not obliquely truncate; wings visible. Male forceps shaped otherwise.

12 (13) Male forceps similar in shape and length to those of the female, those of the male with inner teeth; pygidium of both sexes excised on posterior margin, that of female narrower than that of male. External parameres of male genitalia widest medially. — **Type-species**: *Gressitolabis delicatula* BRINDLE, 1970.

Species: *delicatula* BRINDLE, 1970 (Solomon Islands), *gurneyi* BRINDLE, 1972 (Solomon Islands)

Gressitolabis BRINDLE, 1970

13 (12) Male and female forceps dissimilar in length and shape; pygidia with normal sexually dimorphism. External parameres of male genitalia parallel-sided except at apices. — **Type-species**: *Adiathella lingua* BRINDLE, 1970.

Species: *incisa* BRINDLE, 1970 (Solomon Islands), *lingua* BRINDLE, 1970 (Solomon Islands), *philippinensis* SRIVASTAVA, 1976 (Philippine Islands: Mindanao), *spinosa* BRINDLE, 1970 (Solomon Islands)

Adiathella BRINDLE, 1970

14 (9) Tibiae sulcate or flattened at least in distal 1/4.

15 (16) Legs long and slender, the third reaching at least to the 7th abdominal segment or further. Antennae with about 20 joints; third joint equal in length to fourth and fifth united. Head tumid, postfrontal and coronal sutures distinct. — **Type-species**: *Chelisoches pulchripennis* BORMANS, 1883.

Species: *chinensis* STEINMANN, 1974 (China), *koorgensis* HEBARD, 1923 (India, Malaysia), *pulchripennis* (BORMANS, 1883) (Burma, Vietnam, Sumatra, New Guinea)

Exypnus BURR, 1907

16 (15) Legs short or moderately long.

17 (20) Antennae thicker, the fourth and fifth joints shorter than the third, often globular, all more or less thickened at apex; antennae generally 15–20 jointed. Head tumid, postfrontal and coronal sutures distinct.

18 (19) Apical part of paired external parameres deeply cleft, thus forming two big, sharply divided and equal or unequal lobes. Apical cleavage dividing external paramere into two (inner and outer) obtuse or pointed tusk-like teeth, of which inner one ending usually in sharply elongated tip. — **Type-species**: *Chelisoches formosanus* BURR, 1912

Schizochelisoches gen. n.

19 (18) Paired external parameres not cleft on apical part, original outer lobe forming a uniform and distinct tooth, its tip frequently elongated, original inner lobe strongly and generally unrecognizably reduced, and forming only the extremely variable dentation or tooth on inner margin of a uniform plate. — **Type-species**: *Forficula morio* FABRICIUS, 1775.

Species: *annulatus* (BURR, 1906) (New Guinea), *ater* BORMANS, 1900 (North Australia), *australicus* (LE GUILLON, nec DUBRONY, 1897) (North Australia and New Guinea), *calopteryx* GÜNTHER, 1929 (New Guinea, Solomon Islands), *cheesmanae* HINCKS, 1952 (New Hebrides), *chopardi* HINCKS, 1953 (Madagascar), *flavipennis* (FABRICIUS, 1793, nec CHOPARD, 1951) (Senegal, Equatorial Guinea: Bioko, Cameroon, French Congo, Nigeria, Gabon, Congo Republic), *handschini* GÜNTHER, 1934 (North Australia), *kimberleyensis* MjöBERG, 1913 (Australia), *malgachus* BORMANS, 1903 (Madagascar), *morio* (FABRICIUS, 1775) (Oriental

Region, Papua, Ethiopian Region and USA ?), *paravicinii* GÜNTHER, 1933 (Solomon Islands), *persimilis* MENOZZI, 1933 (Sumatra), *semirufus* BORELLI, 1926 (Malaysia, Sumatra), *variegatus* (BURR, 1917) (Vietnam)

Chelisoches SCUDDER, 1876

20 (17) Antennae slender, all joints slender and cylindrical or semi-pyriform fourth and fifth longer than third.

21 (22) Long and slender earwigs; forceps as long as the abdomen. Tegmina short, wings absent. Abdomen depressed, parallel-sided laterally. — **Type-species:** *Auchenomus birmanus* BORMANS, 1888 (India, Burma, China: Yunnan)

Solenosoma BURR, 1907

22 (21) Forceps shorter than abdomen. Tegmina and wings fully developed. Abdomen cylindrical, a little expanded medially.

23 (24) Apical part of paired external parameres deeply cleft, thus forming two smaller or bigger, equal or unequal lobes. — **Type-species:** *Chelisoches ritsamae* BORMANS, 1884

Schizoporeus gen. n.

24 (23) Paired external paramere not cleft on apical part, original outer lobe forming a uniform and distinct plate. — **Type-species:** *Forficula simulans* STÅL, 1860.

Species: *abdominalis* RAMAMURTHI, 1965 (India), *chatterjeei* KAPOOR, BHARADWAJ et BANERJE, 1971 (India), *coalescens* (BORELLI, 1927) (Philippine Islands, Sumatra), *coloratus* (BURR, 1906) (New Guinea), *corporali* BOESEMAN, 1954 (Sumatra), *cunctator* BURR, 1911 (India), *duroides* HEBARD, 1933 (Australia), *fuscipennis* (DE HAAN, 1842) (Sumatra, Philippine Islands, Malaysia, Borneo, New Guinea), *hosiifieldi* (KIRBY, 1891) (Java), *inermis* BEY-BIENKO, 1959 (China), *laetior* (DOHRN, 1865) (Borneo, Celebes, New Guinea, Bismarck Islands, Solomon Islands), *longiforceps* RAMAMURTHI, 1962 (India), *ludekingi* (DOHRN, 1865) (Sumatra, Java, Borneo, Malay Peninsula, Philippine Islands), *minor* (CAUDELL, 1904) (Philippine Islands), *ramamurthii* KAPOOR, 1967 (India), *simulans* (STÅL, 1860) (Oriental Region and Japan), *sobrinus* (BORMANS, 1884) (Sumatra), *tezpurensis* (SRIVASTAVA, 1969) (India), *torrevillasi* SRIVASTAVA, 1976 (Philippine Islands), *unidentatus* BEY-BIENKO, 1970 (China), *variopictus* (BORMANS, 1900) (Sumatra, Malaysia), *weissi* (BURR, 1904) (Vietnam, Philippine Islands)

Proreus BURR, 1907

Schizochelisoches gen. n.

Head tumid, postfrontal and coronal sutures fairly distinct. Pronotum as broad as head, truncate anteriorly; posterior margin rounded posteriorly. Tegmina and wings well or fully developed. Legs rather short, femora not very stout; tibiae flattened, furrowed in apical half above; tarsi very short, pubescent, rather broad. Abdomen more or less parallel-sided, lateral glandular folds distinct on tergites 3-4. Male forceps various; inner margins armed with larger tooth or teeth. Male genitalia characteristic; apical part of paired external parameres deeply cleft, thus forming two big, sharply divided and equal or unequal lobes. Apical cleavage dividing external paramere into two (inner and outer) obtuse or pointed tusk-like teeth, of which inner one ending usually in sharply elongated tip.

Type-species: *Chelisoches formosanus* BURR, 1912.

Species: *brevipennis* (BORELLI, 1923) (Philippine Islands, Malaysia) comb. n., *diodontus* (RAMAMURTHI, 1967) (Bismarck Islands) comb. n., *formosanus* (BURR, 1912) (Taiwan) comb. n.

Schizoporeus gen. n.

Closely related to *Proreus* BURR, 1907 but apical part of paired external parameres deeply cleft, thus forming two smaller or larger, equal or unequal inner and outer lobes, similar to *Schizodiplatys* STEINMANN, 1974 or *Schizochelisoches* gen. n. species. Antennae slender, the fourth joint is ovate or cylindrical, and neither thickened nor clubbed. Male forceps comparatively short, generally depressed and flattened, inner margins with smaller or larger tooth or teeth.

Type-species: *Chelisoches ritsemae* BORMANS 1884.

Species: delicatulus (BURR, 1911) (Sri Lanka, Malaysia, Borneo) comb. n., *dentatus* (SRIVASTAVA, 1976) (Philippine Islands) comb. n., *ritsemæ* (BORMANS, 1884) (Sumatra, Borneo, Java, Malaysia, Burma, Philippine Islands) comb. n., *shaffi* (BHARADWAJ et KAPOOR, 1967) (Andaman Islands) comb. n.

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