

A study of the higher taxa of the Chelisochidae (Dermaptera)

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Abstract — The subfamilial and generic classification, by a standard grouping of the characteristics of external morphology and the genital apparatus, of the family Chelisochidae Burr, 1907, and an identification key suitable for elaborating world material are given. With 6 figures.

A very distinct and characteristic group of the Dermaptera. Generally dark and often black insects. A common and very characteristic feature is the peculiar development of the tarsomeron mediale, bearing a peg-shaped, obtuse process, extending visibly and strikingly under the ventral surface of the metatarsus and there accumbent below the last joint, indiscernible from above. In a lateral view, it is also very distinct, longer, and occasionally multiply longer, than its joint.

The most highly developed group of the forficuloid-type Eudermaptera. Body more slender, legs longer, wings well developed or absent. The majority of species with a cylindrical and only slightly flattened body. A common character is the male paramere, possessing on the apical surface one genital lobe with included virga in most species. Base of virga with a basal vesiculum present or absent.

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 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, to 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, it implies that the Chelisochidae separated from the main forficuloid stock at an early stage, possibly soon after a reniform vesicle had been evolved at the base of the virga.

IDENTIFICATION KEY TO THE SUBFAMILIES AND GENERA

- 1 (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. — Type-genus: *Chelisochella* VERHOEFF, 1902

Chelisochellinae STEINMANN, 1975

- 2 (3) 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. (Malay Archipelago, India, Borneo, Sumatra, New Caledonia, Burma)

Chelisochella VERHOEFF, 1902

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

Species: *mounseyi* BURR, 1916 (Philippines: Mindanao), *punctulata* (BURR, 1897) (Celebes)

Kinesis BURR, 1907

- 4 (1) Lateral margins of tegmina without a ridge-like edge. 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 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. — Type-genus: *Chelisoches* SCUDDER, 1876
Chelisochinae BURR 1907
- 5 (12) Tibiae not obviously flattened laterally.
- 6 (7) Tarsi long and slender, together about as long as pronotum broad. Antennae with 20 joints, third joint long, but shorter than the fourth and fifth united. 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, 1894) (Burma), *nigrocastaneus* BURR, 1910 (India), *proreoides* RAMAMURTHI, 1967 (Bismarck Island), *shelfordi* (BURR, 1900) (Borneo, Malaysia, India: Sikkim), *tenebrator* (KIRBY, 1891) (India)
Adiathetus BURR, 1907
- 7 (6) Tarsi shorter than the width of the pronotum.
- 8 (9) Body strong depressed. Antennae with fourth joint scarcely longer than broad, fifth about equal to the sixth. Head smooth, depressed. Tegmina and wings ample, smooth. — Type-species: *Mecomera kervillei* BURR, 1905 (Java, India)
Lamprophorella BURR, 1911
- 9 (8) Body not strongly depressed.
- 10 (11) 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 (Burma), *crassus* BORELLI, 1926 (Philippines), *dohertyi* (BURR, 1899) (Celebes), *esaki* MENOZZI, 1941 (Micronesia), *feae* (BORMANS, 1894) (South China, Burma, Malaysia, Java, Sumatra, Borneo, New Guinea, New Zealand), *fuscus* (BORELLI, 1927) (Sumatra), *kempi* BURR, 1913 (North India), *kozlovi* SEMENOV et BEY-BIENKO, 1934 (China, Mongolia), *melanocephalus* (DOHRN, 1865) (India: Sikkim, Assam, Java), *nigrorufus* (BURR, 1902) (New Guinea: Papua, Micronesia, Melanesia), *papuiensis* BURR, 1909 (New Guinea: Papua), *quadrituberculatus* BURR, 1915 (Simalur Island), *semiluteus* (BORMANS, 1899) (Java), *singhi* KAPOOR, 1966 (N. W. Himalayas), *tenebrosus* BRINDLE, 1968 (Philippines), *tezpurensis* SRIVASTAVA, 1969 (India), *tigris* (BURR, 1913) (India), *variicornis* (BORMANS, 1903) (Celebes), *versicolor* BORELLI, 1932 (Philippines), *wernerii* SRIVASTAVA, 1978 (Philippines)
Hamaxas BURR, 1907
- 11 (10) Head smooth, postfrontal and coronal sutures present. Tegmina and wings well developed. Male forceps short, arcuate, swollen at base, inner margins with indistinct senticles at base. — Type-species: *Sphingolabis variegata* KIRBY, 1891.
 Species: *boesemani* STEINMANN, 1981 (Sumatra), *simplex* RAMAMURTHI, 1967 (Bismarck Islands), *variegatum* (KIRBY, 1891) (West Africa: Sierra Leone, Ghana, Cameroon, Nigeria, Congo Republic, and Sumatra, Java)
Euenkrates REHN, 1927
- 12 (5) Tibiae sulcate or flattened only at extreme apex or for at least distal 1/4.
- 13 (18) Tibiae sulcate or flattened only at extreme apex.
- 14 (15) Tegmina short posterior margin obliquely truncate; wings absent. Male forceps undulate and each branch with 3 teeth. Female forceps with long slender branches.

External paramere of male genitalia widest distally. — Types-species: *Tauropygia tridentata* BRINDLE, 1970 (Solomon Island)

Tauropygia BRINDLE, 1970

15 (14) Tegmina longer, posterior margin not obliquely truncate; wings visible. Male forceps otherwise shaped.

16 (17) 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 paramere of male genitalia widest medially. — Type-species: *Gressitolabis delicatula* BRINDLE, 1970.

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

Gressitolabis BRINDLE, 1970

17 (16) Male and female forceps dissimilar in length and shape; pygidia normally sexually dimorphic. External paramere of male genitalia parallel-sided except at apices. — Type-species: *Adiathella lingua* BRINDLE, 1970.

Species: *incisa* BRINDLE, 1970 (Solomon Islands, Guadalcanal, Popamansiu), *lingua* BRINDLE, 1970 (Solomon Islands, Suta, Guadalcanal), *philippinensis* SRIVASTAVA, 1976 (Philippines: Mindanao), *spinosa* BRINDLE, 1970 (Solomon Islands, New Georgia)

Adiathella BRINDLE, 1970

18 (13) Tibiae sulcate or flattened for at least distal 1/4.

19 (20) Legs long and slender, the third reaching at least to the 7th abdominal segment or further. Antennae with about 20 joints; third 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: Fukien), *koorgensis* HEBARD, 1923 (India, Malaya: Perak), *pulchripennis* (BORMANS, 1883) (Burma, Vietnam, Sumatra Borneo, New Guinea)

Exypnus BURR, 1907

20 (19) Legs short or moderately long.

21 (22) Antennae thicker, the 4th and 5th joints shorter than the 3rd, often globular, all more or less thickened at apex; antennae 15–20 jointed. Head tumid, postfrontal and coronal sutures distinct. — Type-species: *Forficula morio* FABRICIUS, 1775.

Species: *annulatus* BURR, 1906 (New Guinea), *ater* BORMANS, 1900 (North Australia), *australicus* (Guillon, 1841) (Northern Australia, New Guinea), *bimammatus* HEBARD, 1929 (Batu, Caves, Selangor), *brevipennis* BORELLI, 1923 (Philippines), *calopteryx* GÜNTHER, 1929 (New Guinea), *cheesmanae* HINCKS, 1952 (Banks Islands), *chopardi* HINCKS, 1953 (Madagascar), *diodontus* RAMAMURTHI, 1967 (Bismarck Islands), *elegans* (BORMANS, 1900) (Sumatra), *elegans* var. *inermis* BOESEMAN, 1954 (Java), *elegans* var. *burri* BOESEMAN, 1954 (Java), *flavipennis* (Fabricius, 1793) (West Africa), *formosanus* BURR, 1912 (Formosa), *fuscipennis* (de HAAN, 1842) (Sumatra), *handschini* GÜNTHER, 1934 (Australia), *imitator* RAMAMURTHI, 1967 (Bismarck Islands), *kimberleyensis* MjöBERG, 1913 (N. W. Australia), *lilyanus* HOLDHAUS, 1908 (Samoa), *malgachus* BORMANS, 1903 (Madagascar), *morio* (FABRICIUS, 1775) (Cosmopolitan), *paravicini* GÜNTHER, 1933 (Solomon Islands), *persimilis* MENOZZI, 1933 (Sumatra), *rubriceps* (BURR, 1900) (Java, Borneo), *semirufus* BORELLI, 1926 (Malaysia), *sobrius* BORMANS, 1884 (Sumatra)

Chelisoches SCUDDER, 1876

22 (21) Antennae slender, all joints slender and cylindrical or semi-pyiform 4th and 5th longer than 3rd.

23 (24) 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

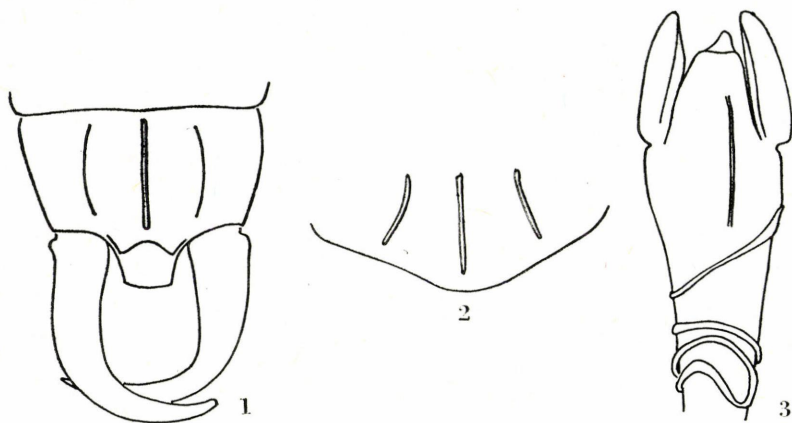
- 24 (23) Forceps shorter than abdomen. Tegmina and wings perfectly developed. Abdomen cylindrical, a little expanded medially. — Type-species: *Forficula simulans* STÅL, 1860.

Species: *abdominalis* RAMAMURTHI, 1965 (India), *chatterjeei* KAPOOR, BHARADWAJ et BANERJEE, 1971 (India), *coalescens* BORELLI, 1927 (Sumatra), *coloratus* (BURR, 1906) (New Guinea), *corporali* BOESEMAN, 1954 (Sumatra), *cunctator* BURR, 1911 (India), *delicatulus* BURR, 1911 (Ceylon), *dentatus* SRIVASTAVA, 1967 (Philippines), *duroides* HEBARD, 1933 (Australia), *fletcheri* HEBARD, 1923 (India), *horsfieldi* (KIRBY, 1891) (Java), *inermis* BEY-BIENKO, 1959 (South Western China), *laetior* (DOHRN, 1865) (Solomon Islands), *longiforceps* RAMAMURTHI, 1962 (India), *ludekingi* (DOHRN, 1865) (Sumatra), *minor* (CAUDELL, 1904) (Philippines), *pusillus* BORELLI, 1918 (Philippines), *ramamurthii* KAPOOR, 1967 (India), *ritsamae* (BORMANS, 1884) (Sumatra), *shaffii* BHARADWAJ et KAPOOR, 1967 (India, Andamana Island), *simulans* (STÅL, 1860) (Oriental Region), *simulans* ssp. *abdominalis* RAMAMURTHI, 1965 (India), *simulans* var. *modestus* (STÅL, 1860) (Indonesia), *torrevillasii* SRIVASTAVA, 1967 (Mindanao), *unidentatus* BEY-BIENKO, 1970 (North Vietnam), *variopictus* (BORMANS, 1900) (Mentawai Island), *weissi* (Burr, 1904) (China: Yunnan, Vietnam, Philippines)

Proreus BURR, 1907

DOUBTFUL POSITION OF TWO TAXA

In 1901 VERHOEFF described the species *Isolabella graeca* from Greece as well as in 1974 KAPOOR the species *Genitalata mahajani* from India. The taxonomic arrangement of the two indicated taxa in the family Chelisochidae is in a few respects dubious in the basis of several their external features. Both species are known by only a single specimen and in rather a bad condition, so they are, not appropriate for ascertaining their specific as well as their generic status in this family. Further specimens are needed to solve the problem considering the fact that the representative of *Isolabella graeca* is damaged on one hand, and the holotype of *Genitalata mahajani* is a larva on the other. The redescription of the two species doubtful in their taxonomic status is given below.



Figs 1-3. *Isolabella graeca* VERHOEFF, 1902, 1 = holotype ultimate tergite and forceps, 2 = penultimate sternite, and 3 = holotype genital armature (Original)

Isolabella VERHOEFF

1901 *Isolabella* VERHOEFF, Sitz. Ges. nat. Fr. Berlin, 1901: 15. — Species typica: *Isolabella graeca* VERHOEFF, 1901.

1911 *Isolabella* VERHOEFF; BURR, Genera Insectorum, 122: 67 (position doubtful).

1971 *Isolabella* VERHOEFF; SAKAI, Derm. Cat. Prael., VI: 264 (position doubtful).

Apterous. Male colour dark brownish black, head black with two spots red at vertex. Forceps of male remote, strongly arched, cylindrical; pygidium large, trapezoidal, scarcely a little longer than broad. Second tarsal joint nearly as long as the third, with no lobe (in the original description; holotype without tarsi).

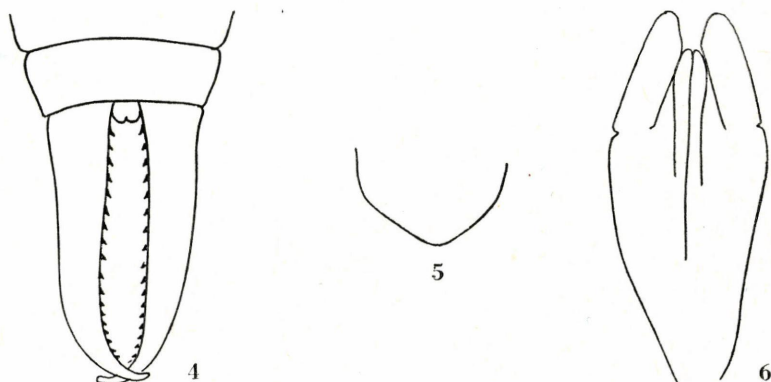
Isolabella graeca VERHOEFF (Figs 1-3)

1901 *Isolabella graeca* VERHOEFF, Sitz. Ges. nat. Fr. Berlin, 1901: 16. — Terra typica: Greece (Type male: Museum für Naturkunde, Berlin, DDR).

1975 *Isolabella graeca* VERHOEFF; HARZ and KALTENBACH. The Orthoptera of Europe, 3: 47, fig. 104 (head), 105 (thorax dorsally), 106 (thorax ventrally), 107 (male forceps dorsally), 108 (same, laterally) 109 (epiproct), 110 (male genitalia), 111 (middle tarsus), 112 (tarsus) (identification uncertain).

Male colour dark reddish-brownish black. Head large, long and a little wider than broad of pronotum. Postfrontal and coronal sutures distinct. Eyes relatively small, shorter than the length of eyes behind. Antennae 18-jointed; but those of the holotype are broken. First antennal joint large, but short, shorter than the distance between antennal bases; second joint transverse, third long, about more or less as long as scape; fourth joint a little longer than broad. Pronotum transverse, a little shorter than long, median longitudinal furrow well marked; lateral margins parallel-sided, posterior margin straight. Tegmina and wings entirely absent. Mesonotum transverse, of Carcinophora-type. Metanotum typical. Legs relative short, second tarsi nearly as long as third, and without of Cheliso-chidae or Forficulidae-type lobes; similar to Labiidae-type. Abdomen is broken in the holotype from 5th to 8th abdominal segments. Ultimate tergite (Fig. 1) broad; median longitudinal sulcus very well marked, deep; pygidium trapezoidal, specific. Forceps of Carcinophora-type, cylindrical, strongly curved; without teeth at inner or outer margins; symmetrical. Penultimate sternite (Fig. 2) characteristic, with three specific protuberances. Genitalia (Fig. 3) specific, of Labiidae-type; central parameral plate without genital lobe, but virga present, specific, without basal vesicle; paramere with characteristic spiral crease; external paramere obtuse, but well developed. — Female unknown. — Length of body with forceps: 13.5 mm.

Distribution: Greece.



Figs 4-6. *Genitalata mahajani* KAPOOR, 1974, 4 = holotype ultimate tergite and forceps, 5 = penultimate sternite, and 6 = holotype genital armature (after KAPOOR)

Genitalata KAPOOR

1974 *Genitalata* KAPOOR, Zool. J. Linn. Soc., 55: 83.

Species typica: *Genitalata mahajani* KAPOOR, 1974.

Entirely abterous. Antennae 36(?)-jointed; third joint long, slender and nearly as long as 4 5 and 6th joints combined; 4th and 5th joints short and globular. Abdomen slender, elongated and parallel-sided, without tubercles dorsally. The second tarsal segment is produced a short lobe ventrally.

Genitalata mahajani KAPOOR (Figs 4-6)

1974 *Genitalata mahajani* KAPOOR, Zool. J. Linn. Soc., 55: 83, fig. 1 (male ultimate tergite with forceps), 2 (penultimate sternite), 3 (male genitalia). — Terra typica: India (Type male: Zoological Survey of India, Calcutta).

Male general colour black, sides of pronotum and legs testaceous. Head a little longer than broad; frons tumid between eyes; postfrontal and coronal sutures thick. Eyes normal, smaller than genae. Antennae 36 (?) jointed; first joint club-shaped, and shorter than 2nd and 3rd combined. Pronotum longer than broad; lateral margins parallel-sided; posterior margin rounded. Tegmina and wings absent. Mesonotum triangular latero-posteriorly, deeply concave postero-medially. Abdomen parallel-sided, ultimate tergite short (Fig. 4) and broad; pygidium very short. Forceps long and slender, slightly broadened at base, then gently narrowing towards apex; inner margins denticulated except for tips. Penultimate sternite (Fig. 5) broadly rounded posteriorly. Genitalia (Fig. 6) with broad median paramere. Not of Chelisochidae-type. Central parameral plate with two undeveloped genital lobes. I should say not imago. — Length of body with forceps: 29 mm. — Female unknown.

Distribution: India.

References

- BURR, M. (1907): A preliminary revision of the Forficulidae (sensu stricto) and the Chelisochidae families of the Dermaptera. — *Trans. R. ent. Soc. London*, p. 91-134.
- BRINDLE, A. (1970): The Dermaptera of the Solomon Islands. — *Pacific Insects*, **12**(3): 641-700.
- KAPOOR, V. C. (1974): *Genitalata mahajani* gen. et sp. nov. from Himachal Pradesh, India (Dermaptera, Chelisochidae). — *Zool. J. Linn. Soc.*, **55**: 83-86.
- POPHAM, E. J. (1968): Genera and species of the Dermaptera. 7. Chelisochidae (Forficuloidea). — *Entomologist*, **101**: 133-136.
- SAKAI, S. (1971): Dermapterorum Catalogus Praeliminaris. VI. The Chelisochidae. — *Daito Bunka University*, Tokyo, pp. 265.
- SAKAI, S. (1982): A new proposed classification of the Dermaptera with special reference to the check list of the Dermaptera of the World. — *Bull. Daito Bunka Univ.*, No. **20**: 1-127.
- STEINMANN, H. (1975): Suprageneric classification of Dermaptera. — *Acta zool. hung.*, **21**: 195-220.
- VERHOEFF, K. (1902): Neue ungeflügelte Eudermapteren-Gattungen. — *Sitz. Ges. nat. Fr. Berlin*, p. 7-18.
- ZACHER, F. (1911): Studien über das System der Protodermapteren. — *Zool. Jb. (Syst.)*, **30**: 303-340.

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