Singhardina Mahmood, 1967 the subgenus of Eurhadina Haupt, 1929 (Auchenorrhyncha, Cicadellidae, Typhlocybinae) : a review, with description of 32 new species

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Singhardina MAHMOOD, 1967 the subgenus of *Eurhadina* HAUPT, 1929 (Auchenorrhyncha, Cicadellidae, Typhlocybinae): a review, with description of 32 new species

by **Irena Dworakowska**

Abstract. Review of all 57 known species of the genus *Eurhadina* HAUPT, 1929, the subgenus *Singhardina* MAHMOOD, 1967, grouped into several species-groups. The new records: *Eurhadina* (*S.*) *rubra* DWORAKOWSKA, 1969 from Northern Borneo, *E.* (*S.*) *punjabensis* DWORAKOWSKA, 1969 and *E.* (*S.*) *vittata* (AHMED, 1969) from Northern India and *E.* (*S.*) *rutilans* HU et KUOH, 1991 from Thailand. The following new species are described from Southeastern Asia: *brevis*, *chiengdaoa*, *dina*, *fasciata*, *gedensis*, *hema*, *intanonica*, *interrupta*, *jarrayi*, *judoka*, *kirkaldyi*, *krispinilla*, *lactea*, *liue*, *mala*, *ornata*, *pallida*, *pookiewica*, *prima*, *quarta*, *rika*, *rona*, *secunda*, *turkey*, *univira*, *uszata*, *variegata*, *warna*, *xantha*, *yingfengica*, *zadyma*, and *zhengi* spp.nov.

Key words. Auchenorrhyncha – Cicadellidae – Typhlocybinae – *Eurhadina* (*Singhardina* MAHMOOD, 1967) – review – new species

Introduction

Since my review over 30 years ago (DWORAKOWSKA 1969) the number of known species increased from 5 to 25. The present account supplements other 32 species new to science. The knowledge of the genus *Eurhadina* and its subgenera is still far from being complete and because of that it is too early to indicate phylogenetic relationships between all 57 species known now.

Singhardina MAHMOOD, 1967, the subgenus of *Eurhadina* HAUPT, 1929, is distributed mainly in the mid elevations of mountains of the Oriental Region and at its border with Palaearctic. The host plants of the majority of species are not known, for those known it is mostly *Castanopsis*, but also *Quercus*, *Aesculus* and *Salix*. Majority of the specimens used in this work was collected in light traps or came from deposits in lamp domes. Like in *Eurhadina* s.str. (LAUTERER 1995), also in *Singhardina* exclusively males are attracted to light. I spotted larvae and adults of *E.* (*S.*) *punjabensis* DWORAKOWSKA, 1969 and *E.* (*S.*) *vittata* (AHMED, 1969) in Kumaon Hills (Uttar Pradesh, Northern India) on evergreen oak in February what allows me to presume that these species produce more than two generations a year and, probably, have no winter diapause.

During 1999–2000 I worked in People's Republic China on a project related to environmental issues sponsored by Canadian International Development Agency (CIDA). This enabled me to revise the species described by Chinese authors and participate in finding another 24 species of *Singhardina* new to science as well as a new genus which is the closest known relative of the genus *Eurhadina*. The results of the work will be published by the Chinese authors. Because of that there are fewer species names listed in this paper than known from the literature. The collection from P. R.

China deposited in Yangling contains also 7 species described here, viz: *fasciata, intanonica, jarrayi, judoka, prima, uszata* and *yingfengica* spp.nov.

Abbreviations used to indicate curators of the type series of newly described species:

SMTD ..... Stätliches Museum für Tierkunde in Dresden, Germany

DOA ..... Entomology and Zoology Division, Department of Agriculture, Bangkok, Thailand

NMNHL ..... The National Museum of Natural History in Leiden, The Netherlands

BMNH ..... The Natural History Museum, London, UK

MM ..... Moravian Museum, Brno, Czech Republic

Taxonomy

Genus *Eurhadina* HAUPT, 1929

Subgenus *Singhardina* MAHMOOD, 1967

MAHMOOD 1967, *Pac. Ins. Mon.* **12:** 32.

Type species: *Singhardina robusta* MAHMOOD, 1967.

Diagnosis. Body fuseeform in dorsal view (Fig. 1), flattened dorso-ventrally, with frontoclypeus concave and transition vertex to face narrowly rounded in profile (Fig. 5.). Vertex produced in the midline (Fig. 12). Face only slightly narrowing ventrad, eyes prominent (Fig. 10). Fore wing slightly to considerably narrowing apicad. Colouration often bright and the pattern usually not restricted to the apical quarter of the wing (Fig. 11). Fore wing venation very diverse (Figs 3, 8, 9, 11, 13), with the most of the difference made by the course of RP vein apically what affects the size of 4th apical cell and by the course of MP that results in broadening of r cell apically (Figs 3, 8).

Hind wing broader apically than in the nominate subgenus but rp apical cell narrow (Fig. 4).

Genital capsule slightly laterally compressed, its proportions as in nominate subgenus except anal tube (Fig. 7) longer. Pygofer with basically two well differentiated lobes caudally: the dorsal one (coxal in origin) and the ventral one (trochanteral in origin), either or both may be pigmented at their caudal extremes (Figs 7, 15, 187, 285). Subgenital plate tubular, narrowing caudad, with setosity very much differentiated, usually without apical pigmentation (Fig. 6). Paramere (Figs 21, 36, 121, 134) with slightly varying proportions between the caudal part and the two remaining ones, its prominent lobate protrusion consisting of two joining parts (ventral femoral and dorsal tibial). Penis with ventral apical processes originating from the1st section and dorsal apical ones of the 2nd section, the latter often subdivided and sometimes accompanied with additional protrusions (Figs 19, 93). In *E.* (*S.*) *kirkaldyi* and *E.* (*S.*) *quarta* there are processes arising from the 3rd section and in the former there are additional lateral

processes at the base of penis stem originating from the 1st section (Figs 358, 359). Description of penis construction (with examples) as consisting of four sections is in my previous paper (DWORAKOWSKA 1997).

In female sternite 7 with three small lobes caudally (Fig. 16); valvula slightly protruding beyond coleostron, pigmented apically (Fig. 17). Notchings and serrations on valvae, especially valva 2 (trochanteral endite of segment 9) obliterated in comparison with these in the nominate subgenus.

Records and descriptions of new species*)

The *Eurhadina* (*Singhardina*) *punjabensis* species group:
anurous, *biavis*, *centralis*, *chiengdaoa* sp.nov., *choui*, *cuii*, *dazhulana*, *exclamationis*, *fasciata* sp.nov, *flavicorona*, *fusca*, *maculata*, *nasti*, *punjabensis*, *quarta* sp.nov., *rubra*, *rubrovittata*, *rutilans*, *uszata* sp.nov., *variegata* sp.nov., *warna* sp.nov., *wuyiana*, *xantha* sp.nov. and *zadyma* sp.nov.

Diagnosis. Colouration usually bright (Figs 1, 12), on dorsum often complex pattern of yellow, orange and pink to reddish and even purplish and various shades of brown to black; rarely whitish with only brownish to blackish pattern. Vertex usually triangularly produced anteriorly, narrowly rounded apically; often apex of scutellum blackish. Fore wing distinctly narrowing apicad, 3rd apical cell often stalked (Figs 22, 32), rarely sessile (Fig. 45).

In male genitalia characteristic is a sclerotized protrusion on the dorsal margin of pygofer close to dorso-caudal angle, the protrusion arises from sclerotized ledge (Fig. 57) and has a membrane attached to it mesally (Fig. 25). Ventral lobe pigmented. Subgenital plate moderately narrow caudally, with numerous differentiated microsetae (Fig. 27). Paramere (Figs 21, 44) with the caudal part subequal or slightly shorter than the length of the remaining two parts combined, broadened subapically, bluntly terminated. Penis stem often broadened (Figs 19, 53) with two pairs of apical processes, at least one of them branched; the dorsal processes often branched at their base, rarely a third pair of processes ventrally, near gonopore (Figs 54, 59).

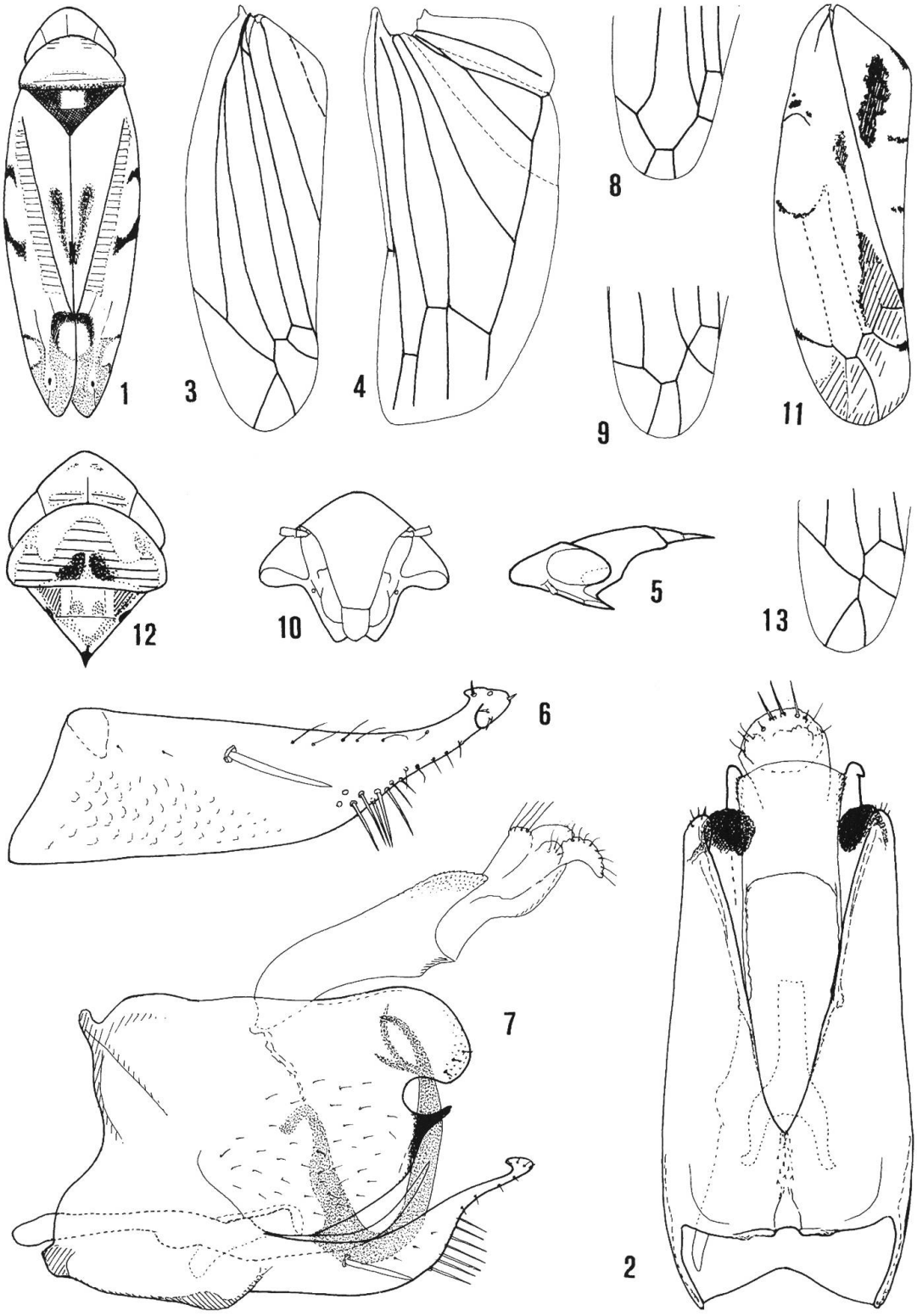
Eurhadina (*Singhardina*) *punjabensis* DWORAKOWSKA, 1969
(Figs 1, 2, 15–17)

DWORAKOWSKA 1969: 76.

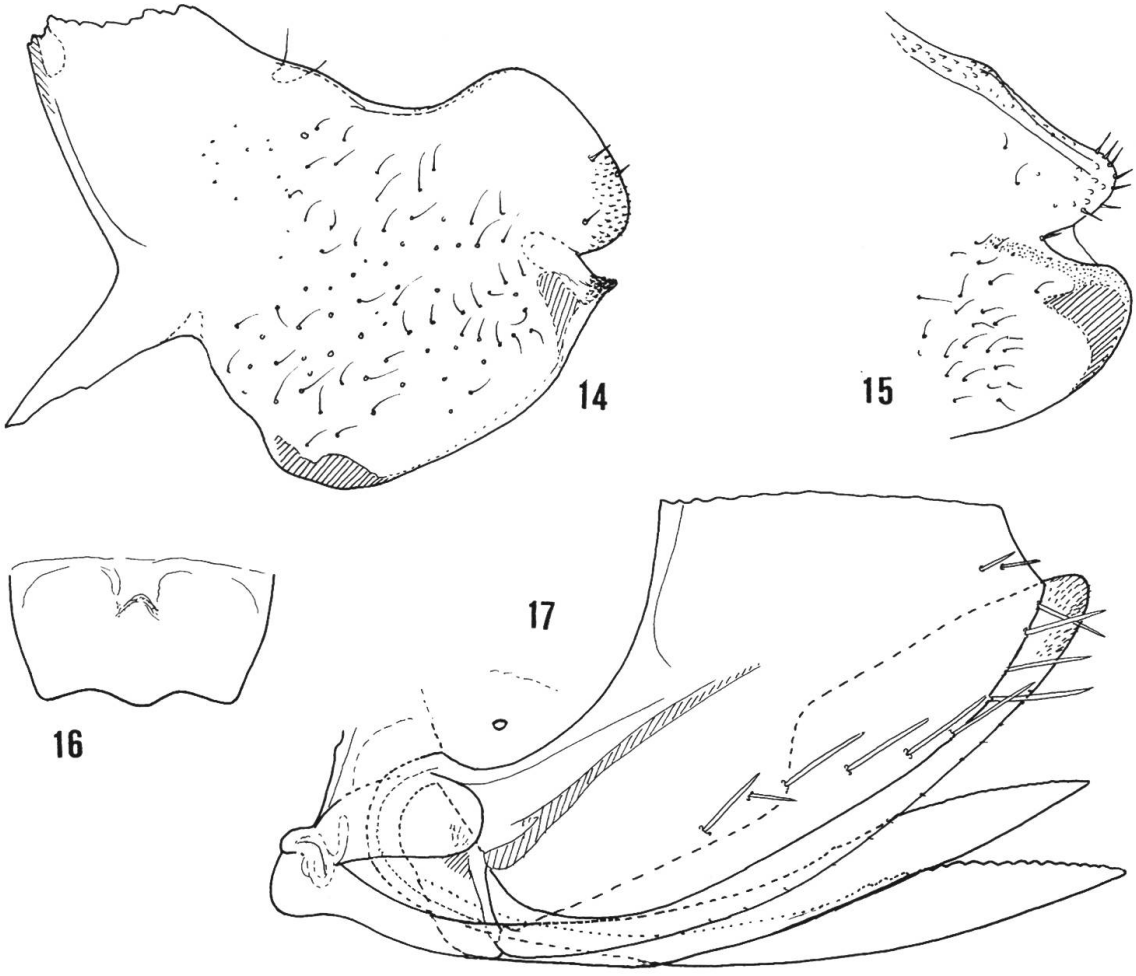
Records published. NE Pakistan, Murree (on *Quercus dilatata* and *Q. incana*) (AHMED 1969: 317); NW India, H.P., 16 km NE of Simla; N India, U.P., Kumaon Hills, Naini Tal (DWORAKOWSKA 1982: 157).

Material examined. 1 ♂, 6 ♀: NW India, H.P., Manali, *Salix*, 16. X. 1981, I. Dworakowska leg.; 4 ♂♂: U.P. Naini Tal, 2100 m, lamp domes, 1990; 1 ♀, Naini Tal, 2100 m, *Quercus*, 12. II. 1991; 3 ♂♂, 3 ♀♀, larvae, same data, 13. II. 1991, I. Dworakowska leg.

*) The sequence of listing of the species reflects supposed phylogenetic relationships.



Figs 1–13. *Eurhadina* (*Singhardina*) *punjabensis*: 1 – habitus, dorsal view, 2 – male terminalia, dorsal view (prominent pigmentation of ventral lobe of pygofer); *E.* (*S.*) *hema* sp.nov.: 3 – fore wing venation; *E.* (*S.*) *mamata*: 4 – hind wing venation, 5 – head and thoracic tergites, side view, 6 – subgenital plate, side view, 7 – male terminalia, side view; *E.* (*S.*) *turkey* sp.nov.: 8 – venation of apical part of fore wing; *E.* (*S.*) *vittata*: 9 – venation of apical part of fore wing, 10 – face; *E.* (*S.*) *ornata* sp.nov: 11 – left fore wing, on slide, 12 – head and thorax, dorsal view; *E.* (*S.*) *pallida* sp.nov.: 13 – venation of apical part of fore wing.



Figs 14–17. *Eurhadina* (*Singhardina*) *mamata*: 14 – pygofer, on slide; *E.* (*S.*) *punjabensis*: 15 – caudal part of pygofer, on slide, 16 – sternite 7 of female, on slide, 17 – female terminalia, dissected parts of segment 8 and segment 9, on slide.

Eurhadina (*Singhardina*) *zadyma* sp.nov.

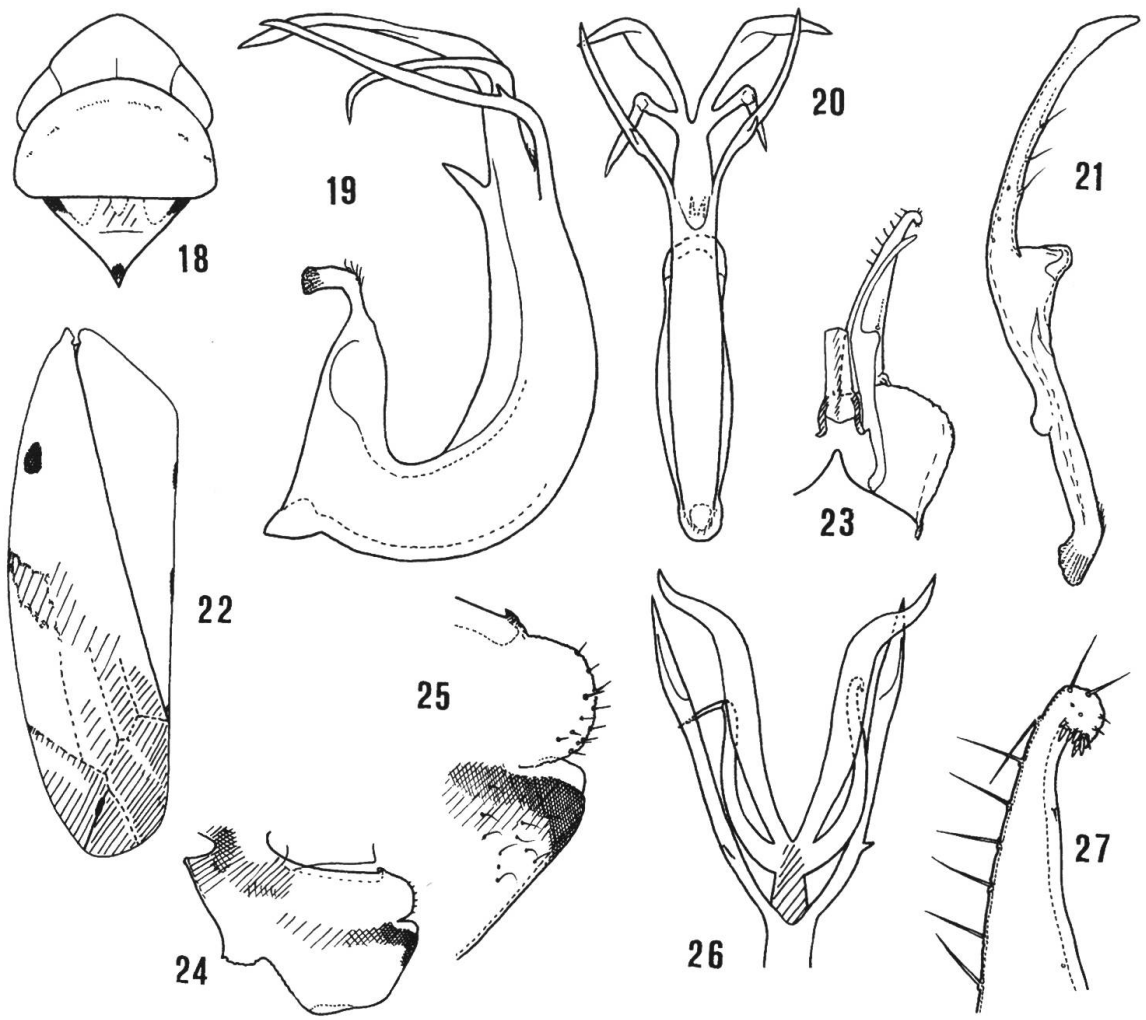
(Figs 18–27)

Material examined. Holotype ♂: Thailand, "Fang" [territory], Chiengmai, lot 4117, 8.XI. 1988 A. Lewvanich leg. (DOA).

Description. Dorsum testaceous. Scutum with blackish marks laterad of slightly brownish-yellow basal triangles; scutellum with blackish apex (Fig. 18). Fore wing sordid whitish with brownish pattern (denoted by diagonal lines in Fig. 22) and blackish patches anteriad of wax-field, on commissural margin of clavus and on RP subapically.

Length ♂: 4.00 mm.

Differential diagnosis. Except the distinct external characters the new species differs from all others in the group by prominent dorsal lamellae in penis, each provided with prominent protrusion, penis stem broad, uniquely shaped penis processes (Figs 19, 20, 26) and lamellate broadening of subapical part of paramere (Fig. 21). The new species slightly resembles *E.* (*S.*) *punjabensis*.



Figs 18–27. *Eurhadina* (*Singhardina*) *zadyma* sp.nov.: 19 – penis, side view, 20 – penis, posterior view, 21 – paramere, on slide, 23 – proportions of sternite 9, connective, paramere and subgenital plate, on slide, 24 – proportions and pattern of pigmentation of pygofer and basal segment of anal tube, on slide, 25 – caudal part of pygofer, 26 – apical part of penis, dorsal view, 27 – apical part of subgenital plate, on slide.

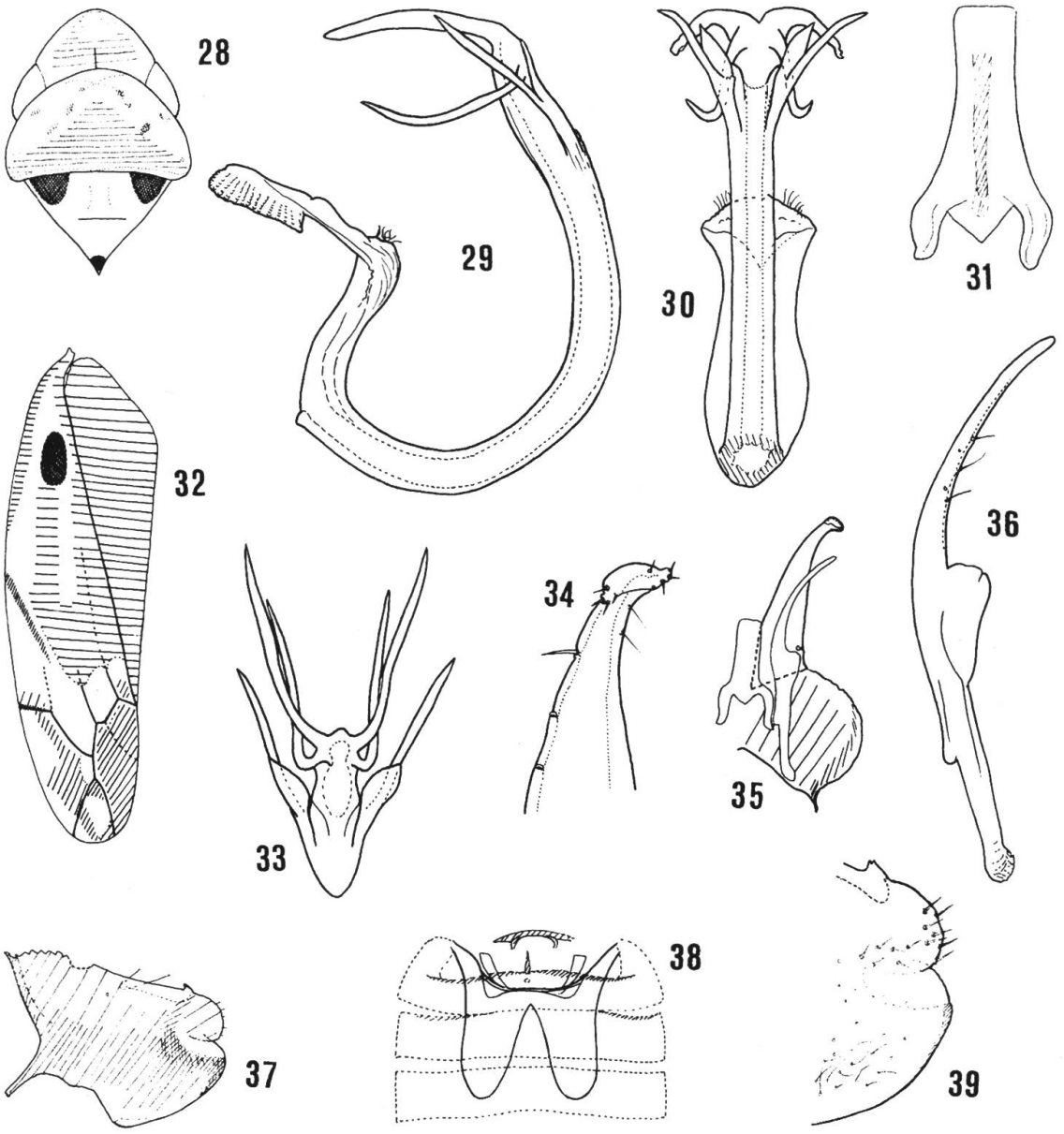
Eurhadina (*Singhardina*) *uszata* sp.nov.

(Figs 28–39)

Material examined. Holotype ♂: Thailand, "Fang" [territory], Chiengmai, lot 4177, 8. XI. 1988, V. Khuntong leg. (DOA). Paratype ♂: same data as the holotype. (DOA).

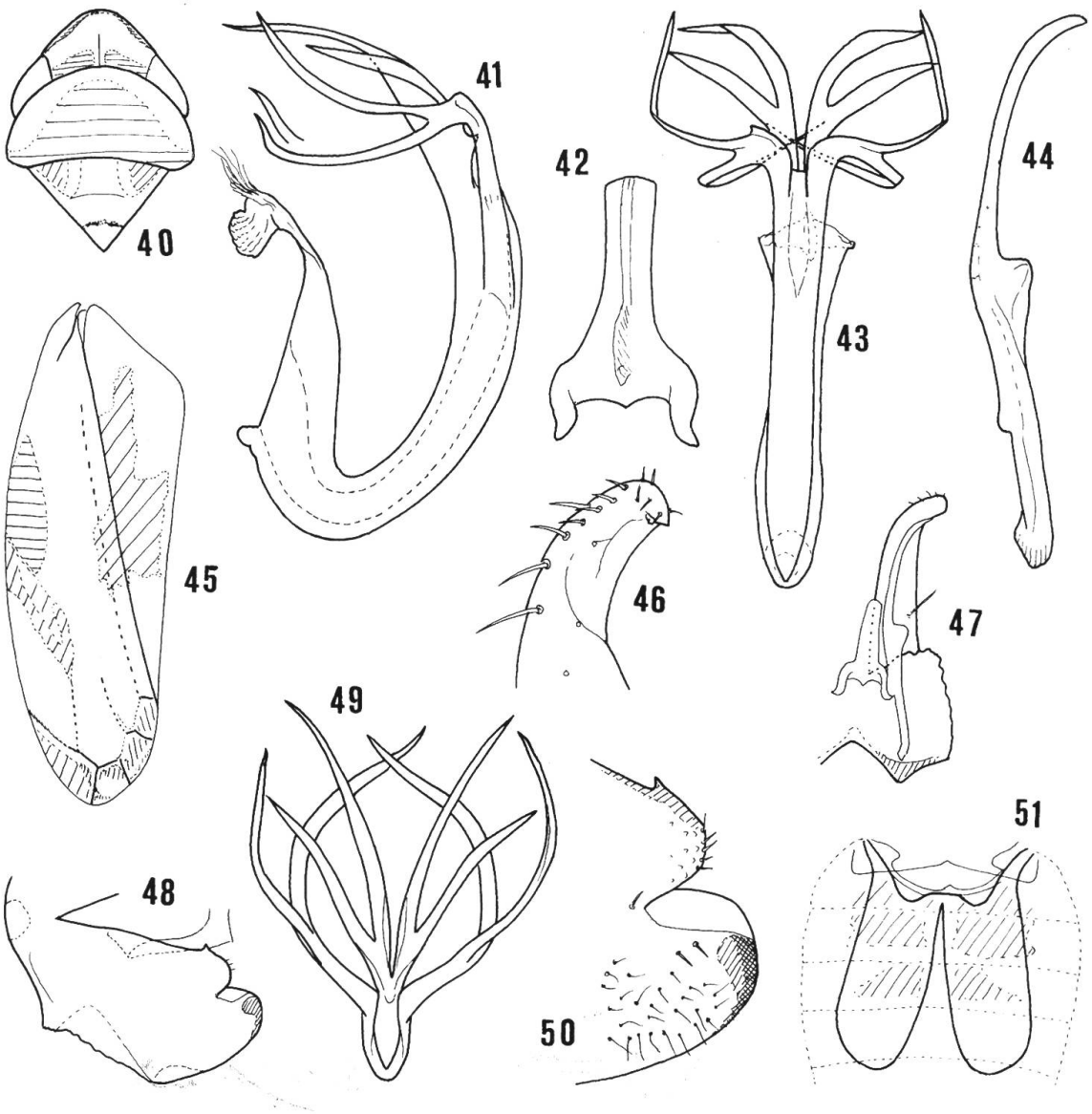
Description. Light beige, with basal triangles, apex of scutellum and large oval patch meso-proximally of wax-field on fore wing, blackish. Scutum and scutellum yellow-ochre. In the paratype centre of scutum and centre of scutellum infuscate. Areas diagonally striped or dotted in Figs 28 and 32 are of various shades of brown; the ones horizontally striped are reddish-ochre.

Length ♂: 3.65 and 3.70 mm.



Figs 28–39. *Eurhadina* (*Singhardina*) *uszata* sp.nov.: 31 – connective, on slide, 33 – apical part of penis, dorsal view, 34 apical part of subgenital plate, on slide, 35 – proportions and pigmentation of sternite 9, connective, paramere and subgenital plate, on slide, 36 – paramere, on slide, 37 – shape and pigmentation of pygofer and base of anal tube, on slide, 38 – male basal abdominal apodemes of sternite 3, on slide, 39 – caudal part of pygofer, on slide.

Differential diagnosis. Except colouring pattern *E.* (S.) *uszata* sp.nov. differs from all known species of the subgenus also by the male genitalia. Especially characteristic is penis structure (Figs 29, 30, 33), almost straight, tapering caudal part of paramere (Fig. 36) and lacking of a pointed protrusion on apex of subgenital plate (Fig. 34). Male basal abdominal apodemes rather small (Fig. 38).

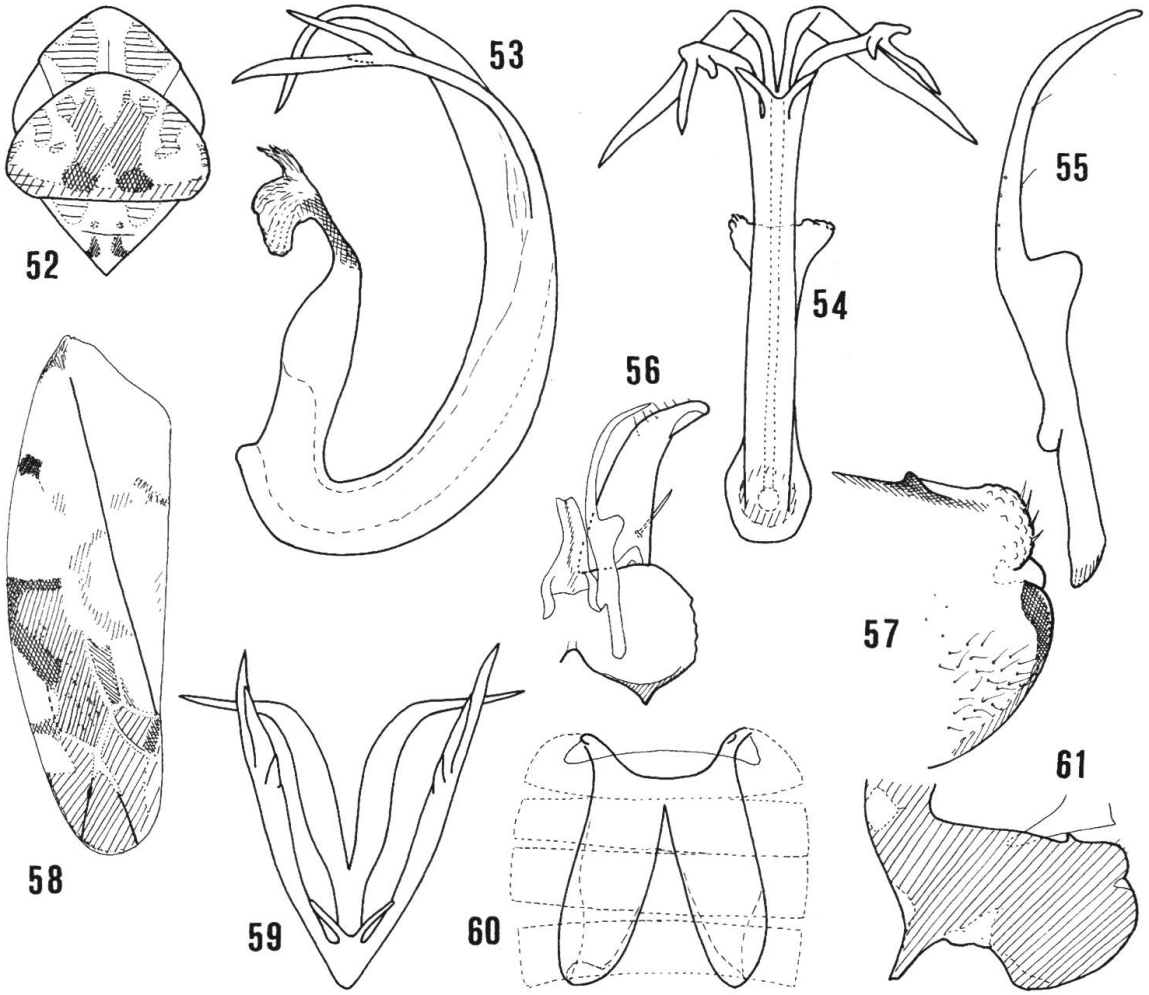


Figs 40–51. *Eurhadina* (*Singhardina*) *variegata* sp.nov.: 41 – penis, side view (illustrated also termination of lower branch of ventral appendage of the opposite side), 42 – connective, on slide, 43 – penis, posterior view, 44 – paramere, on slide, 46 – apical part of subgenital plate, on slide, 47 – proportions and pigmentation of sternite 9, connective, paramere and subgenital plate, on slide, 48 – proportions and pigmentation of pygofer, basal segment of anal tube and small fragment of sternite 9, on slide, 49 – apical part of penis, dorsal view, 50 – caudal part of pygofer, on slide, 51 – male basal abdominal apodemes of sternite 3 (pigmentation of tergites indicated by diagonal lines), on slide.

Eurhadina (*Singhardina*) *variegata* sp.nov.
(Figs 40–51)

Material examined. Holotype ♂: N Borneo, Malaysia, Sarawak, Gunung Mulu Nat. Park, Base Camp, Helipad, 17–30. IX. 1977, D. Hollis leg. (BMNH).

Description. Beige, with orange suffusion on pronotum and fasciae at base and at anterior margin of vertex (horizontally striped in Fig. 40). Narrow transverse blackish fascia on scutellum. Brownish-grey colour on fore wing denoted by diagonal stripes in Fig. 45, wax-field orange.



Figs 52–61. *Eurhadina* (*Singhardina*) *quarta* sp.nov.: 53 – penis, side view, 54 – penis, posterior view, 55 – paramere, on slide, 56 – proportions of sternite 9, connective, paramere and subgenital plate, on slide, 57 – caudal part of pygofer, on slide, 59 – apical part of penis, dorsal view, 60 – male basal abdominal apodemes of sternite 3, on slide, 61 – proportions and pigmentation of pygofer and basal segment of anal tube, on slide.

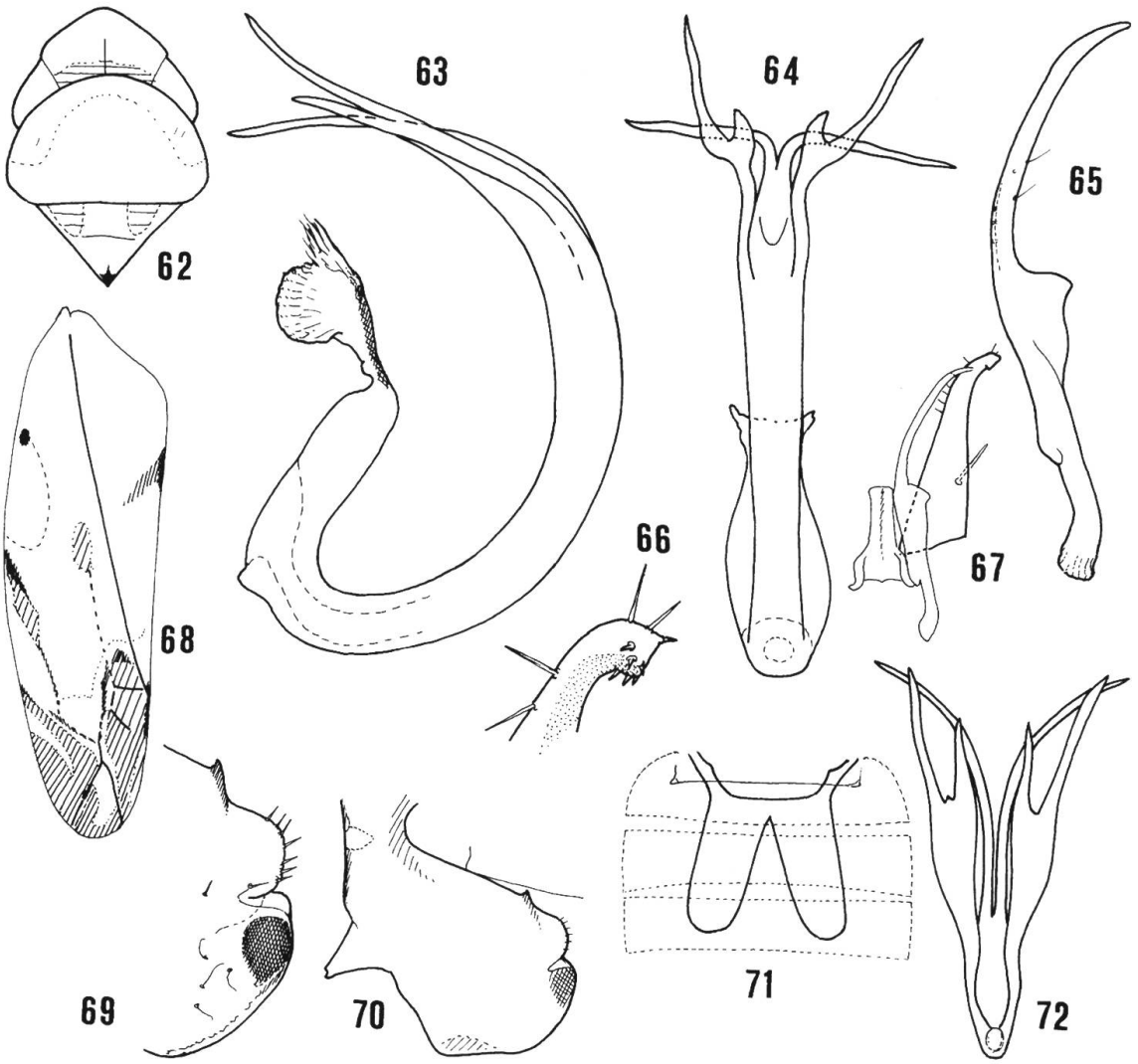
Length ♂: 3.65 mm.

Differential diagnosis. Distinct colouring pattern and strongly reduced apical cells in fore wing along with male genitalia allow to distinguish the new species from all the others within the group. In male genitalia especially characteristic is penis structure (Figs 41, 43, 49), caudal part of paramere (Fig. 44) which resembles a hockey stick and rather broad apical part of subgenital plate (Fig. 46) retaining the pointed apical protrusion.

Eurhadina (*Singhardina*) *maculata* Dworakowska, 1969

Dworakowska 1969: 74.

Record published. N Vietnam, Mouong-xen, 900 m (Dworakowska 1969: 74).



Figs 62–72. *Eurhadina* (*Singhardina*) *rutilans*: 63 – penis, side view, 64 – penis, posterior view, 65 – paramere, on slide, 66 – apical part of subgenital plate, on slide, 67 – proportions of connective, paramere and subgenital plate (misplaced), on slide, 69 – caudal part of pygofer, on slide, 70 – proportions and pigmentation of pygofer and base of anal tube, on slide, 71 – male basal abdominal apodemes of sternite 3, on slide, 72 – apical part of penis, dorsal view.

Eurhadina (*Singhardina*) *nasti* DWORAKOWSKA, 1969

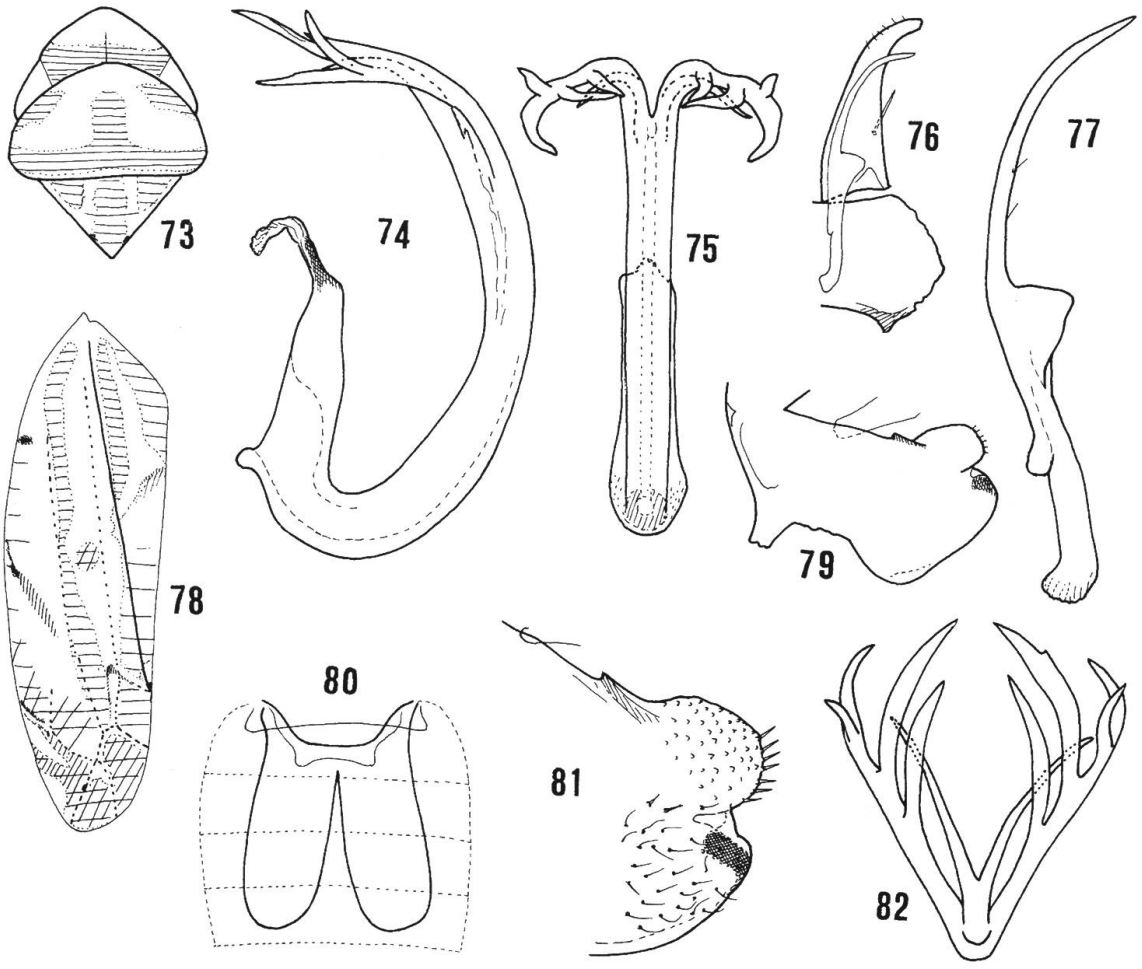
DWORAKOWSKA 1969: 76.

Record published. China, Cun-hua, 96 km of Guangzhou (DWORAKOWSKA 1969: 76).

Eurhadina (*Singhardina*) *quarta* sp.nov.

(Figs 52–61)

Material examined. Holotype ♂: Thailand, Chiengmai Prov., Chiengmai, 9. IV. 1976, Aroon Samruadkit leg. (DOA).



Figs 73–82. *Eurhadina* (*Singhardina*) *fasciata* sp.nov.: 74 – penis, side view, 75 – penis, posterior view, 76 – proportions of sternite 9, paramere and subgenital plate, (slightly misplaced), on slide, 77 – paramere, on slide, 79 – proportions and pigmentation of pygofer and base of anal tube, on slide, 80 – male basal abdominal apodemes of sternite 3, on slide, 81 – caudal part of pygofer, on slide, 82 – apical part of penis, dorsal view.

Description. Head and pronotum whitish. Face below bases of antennae blackish-brown. Vertex with two orange Y-shaped patches. On dorsal side of thorax and on fore wing a complex pattern of various shades of brown (marked by diagonal stripes in Figs 52, 58), blackish (chequered) and orange (marked by horizontal lines in Fig. 52), caudal part of cu cell slightly pinkish. Basal triangles ochre-yellow. Some veins in apical third of fore wing bordered with white.

Length ♂: 3.40 mm.

Differential diagnosis. The external characters alone allow to distinguish the new species from all others known until now but male genitalia show more details and some unique characters, e.g. penis structure (Figs 53, 54, 59) with its short ventral processes and paramere (Fig. 55) with its caudal part arcuate, broadened subapically and terminated on narrow protrusion.

Eurhadina (*Singhardina*) *rutilans* HU et KUOH, 1991
(Figs 62–72)

HU & KUOH 1991: 260.

Record published. China, Yunnan, Menghai (HU & KUOH 1991: 260).

Material examined. 1 ♂: Thailand, Chiengmai, 10. X. 1975, Aroon Samruadkit leg.; 1 ♂: "Fang" [territory], Chiengmai, lot 4117, 8. XI. 1988, A. Lewvanich leg.; 1 ♂, same data, V. Khuntong leg.

Eurhadina (*Singhardina*) *anurous* ZHANG et XIAO, 2000

ZHANG & XIAO 2000: 110.

Record published. China, Yunnan, Yuxi (100 km S of Kunming) (ZHANG & XIAO 2000: 110).

Eurhadina (*Singhardina*) *fasciata* sp.nov.
(Figs 73–82)

Material examined. Holotype ♂: Thailand, Chaiaphum Prov., Pookiew, January 1980 Aroon Samruadkit leg. (DOA). Paratypes: 2 ♂♂, same data as the holotype; 1 ♂: Pookiew, 15. III. 1975; 1 ♂: Chiengmai Prov., Doi Ang Kong, 1400 m, 1. IV. 1979; 1 ♂: Chiengmai, 9. IV. 1976; 1 ♂: „Fang" [territory], Chiengmai, 15. IX. 1987, all collected by Aroon Samruadkit. (DOA).

Description. Head and pronotum whitish with an orange pattern (denoted by horizontal stripes in Fig. 73). Scutum and scutellum yellowish with citrine yellow pattern and small dark marks subapically. Fore wing yellowish except whitish apical cells, orange-beige pattern denoted by horizontal stripes, dark beige to brownish denoted by diagonal stripes and blackish marked by chequered areas in Fig. 78.

Length ♂: 3.50–3.70 mm.

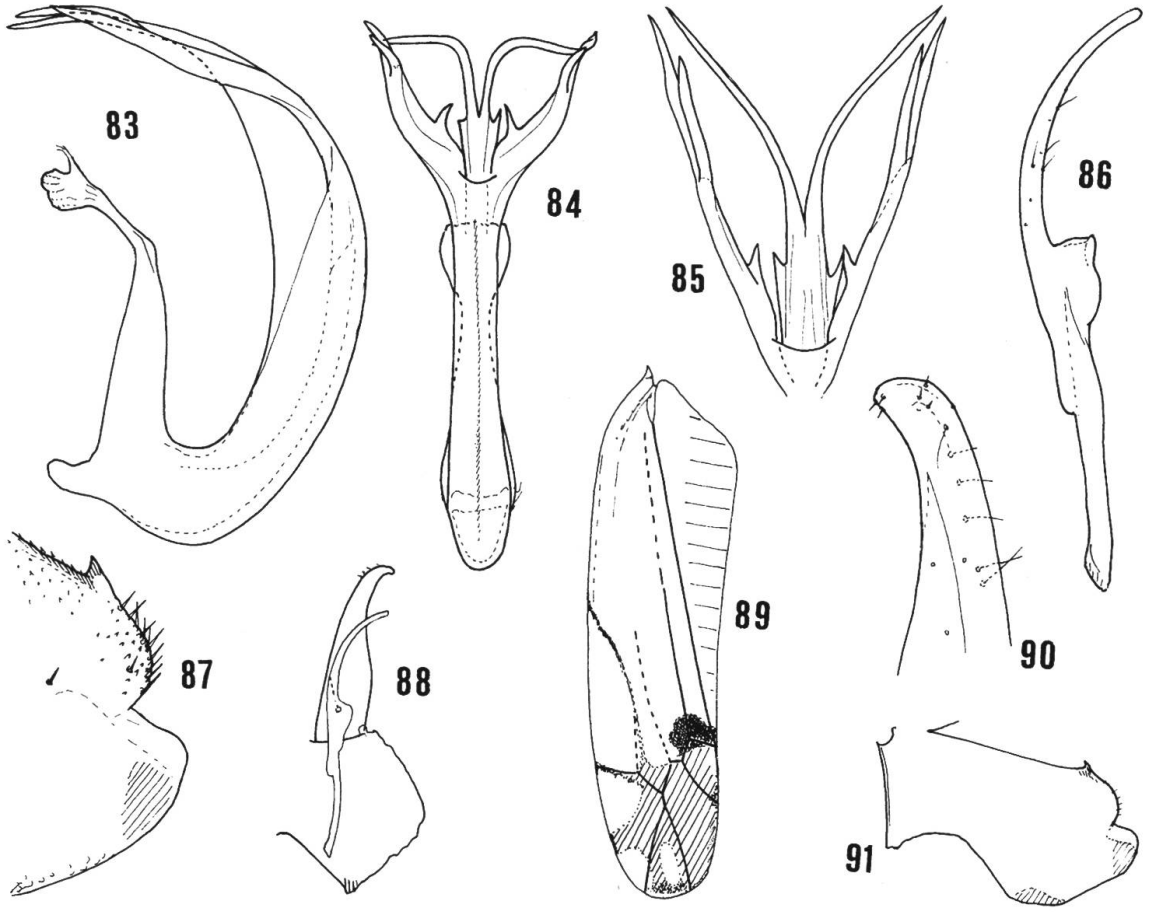
Differential diagnosis. The new species is comparable to *E.* (*S.*) *rutilans* but the distinct pattern of orange stripes on fore wing resembles *E.* (*S.*) *anurous*. Male genitalia indicate close relation to *E.* (*S.*) *rutilans* but penis stem in the new species is shorter (Fig. 74), its ventral processes bearing four branches (Figs 75, 82) instead of two and caudal part of paramere (Fig. 77) longer. Abdominal apodemes (Fig. 80) broad.

Eurhadina (*Singhardina*) *fusca* CAI et KUOH, 1993

CAI & KUOH 1993: 222.

Record published. China, Fujian, Chong-an, 750 m (CAI & KUOH 1993: 222).

Remarks. This species shows remarkable variability in colouration in which distinct ochre patches become replaced by ivory and in such cases orangeous areas appear in other regions.



Figs 83–91. *Eurhadina* (*Singhardina*) *xantha* sp.nov.: 83 – penis, side view, 84 – penis, posterior view, 85 – apical part of penis, dorsal view, 86 – paramere, on slide, 87 – caudal part of pygofer, on slide, 88 – proportions of sternite 9, paramere and subgenital plate, on slide, 90 – apical part of subgenital plate, on slide, 91 – shape and pigmentation of pygofer, on slide.

Eurhadina (*Singhardina*) *choui* Huang et Zhang, 1999

Huang & Zhang 1999: 247.

Record published. China, Hunan, Mangshan (Huang & Zhang 1999: 247).

Eurhadina (*Singhardina*) *flavicorona* Cai et Kuoh, 1993

Cai & Kuoh 1993: 224.

Record published. China, Fujian, Chong-an, 750 m (Cai & Kuoh 1993: 224).

Eurhadina (*Singhardina*) *xantha* sp.nov.
(Figs 83–91)

Material examined. Holotype ♂: India, Meghalaya, Cherrapunji, 1400 m, 24. II. 1991, I. Dworakowska leg. (SMTD). Paratype: ♀, same data as the holotype. (SMTD).

Description. Dorsal side light yellow except whitish basal part of costal region in fore wing and broad pinkish stripe (marked by horizontal lines in Fig. 89) on clavus. Distinct pattern of light brown to blackish in apical region of fore wing denoted by diagonal stripes or chequered in Fig. 89.

Length ♂: 3.40, ♀ 3.30 mm.

Differential diagnosis. The new species is closely related to *E* (*S.*) *flavicorona* differing externally by blackish patch on fore wing expanded mesad along CuA" and occupying the whole apical part of cua cell. Penis in the new species has broader stem (Fig. 83) and its ventral processes lamellate basally (Fig. 84).

Eurhadina (*Singhardina*) *rubra* DWORAKOWSKA, 1969
(Figs 92–100)

DWORAKOWSKA 1969: 76.

Record published. N Vietnam, Lao-cai (DWORAKOWSKA 1969: 76).

Material examined. 5 ♂♂: N Borneo, Malaysia, Sarawak, 16 km N of Bario, Long Rapun Sg. Dapur, 1200 m, 3°53' N, 115°35' E, ML, 19–20. II. 1987; 1 ♂: trail Pa Lungan–Long Rapun, 1200 m, 3°53' N, 115°35' E, 23. II. 1987; 1 ♂: Malaysia, Sabah, Poring hot spring Sg. Montokungon road Ranau–Kg. Poring, 450 m, 116°43' E, 6°02' 30" N, ML, 25. XI. 1986; 1 ♂: Long Pa Sia confl. S Maga and S Pa Sia, 1350 m, 115°40' E, 4°26' N, sandsoil moist forest, 16–19. X. 1986, J. Huisman leg.; 1 ♂: S Sabah, Beaufort, 105 km S of Long Pa Sia area confl. Pa Sia–Matang, 1000 m, 115°43' E, 4°24'N, semicultivated area, at light, 10. IV. 1987, van Tol & Huisman leg.; 1 ♂: confluence Sg. Pa Sia–Maga, 1210 m, along S Maga, 115°40' E, 4°26' N, natural tropical forest, at light, 2. IV. 1987, J. van Tol & J. Huisman leg.; 3 ♂♂: NW Sabah, Kinabalu Park, W slope of Kinabalu, Marai Parai, 1670 m, 116°31' E, 6°04'30" N, exposed site in montane tropical forest, kerangas, at light, 8. III. 1987, van Tol & Huisman leg.

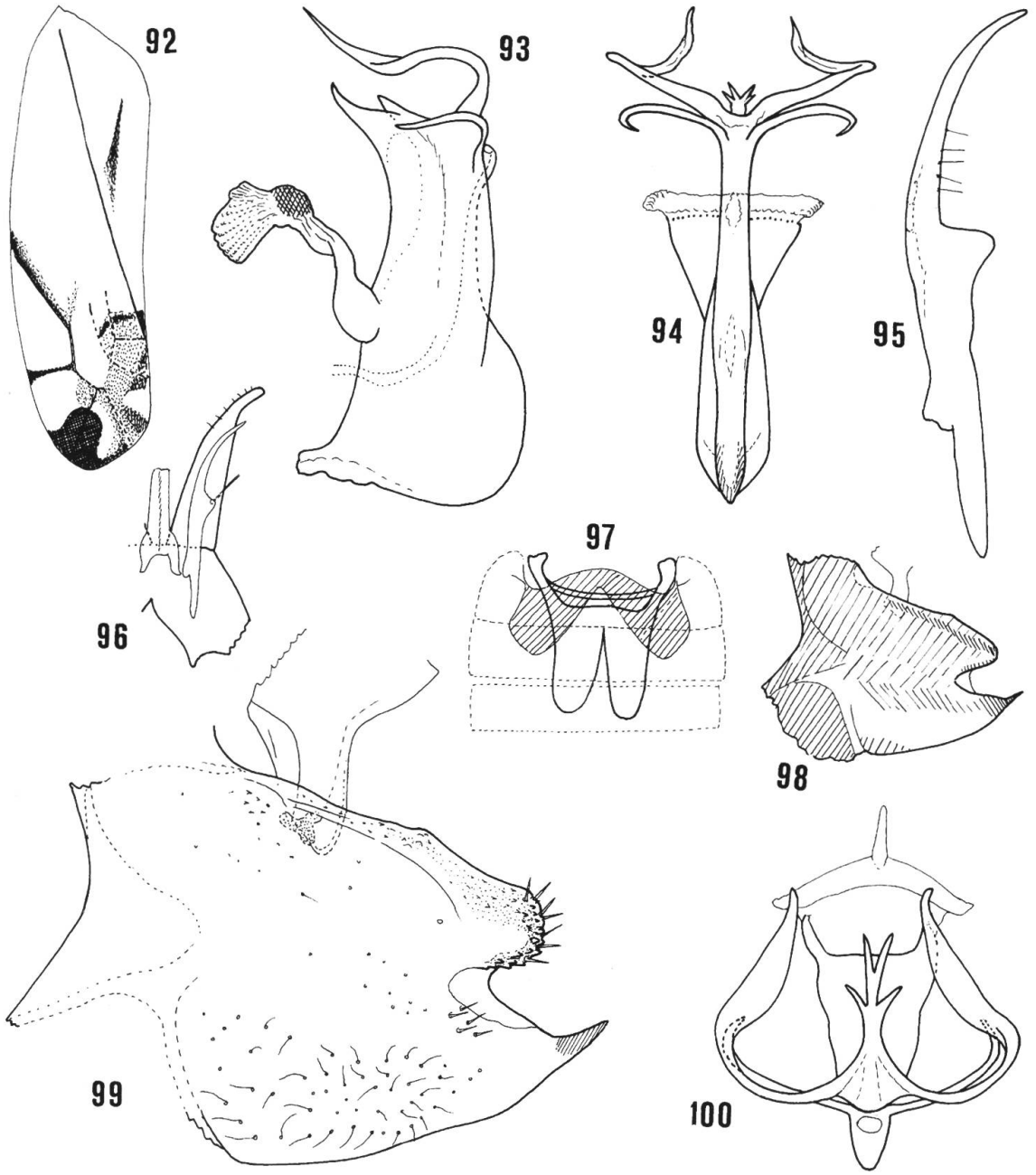
Remarks. *Eurhadina* (*S.*) *rubra* and several related species (to be described by Chinese authors) are characteristically uniformly coloured on head and dorsal side of thorax. In most of species background of fore wing in various shades of ochre to reddish, often with pure pink areas, in numerous species distinct dark patch on clavus. Always the black spot on apical RP considerably expanded into patch and there is contrasting white triangular "notch" in 2nd apical cell. The 3rd apical cell sessile.

The specimens from Borneo show small differences in comparison with the holotype from Vietnam, viz. the longest dorsal process derived from 2nd section of penis (Fig. 100) are narrower.

Eurhadina (*Singhardina*) *warna* sp.nov.
(Fig. 107)

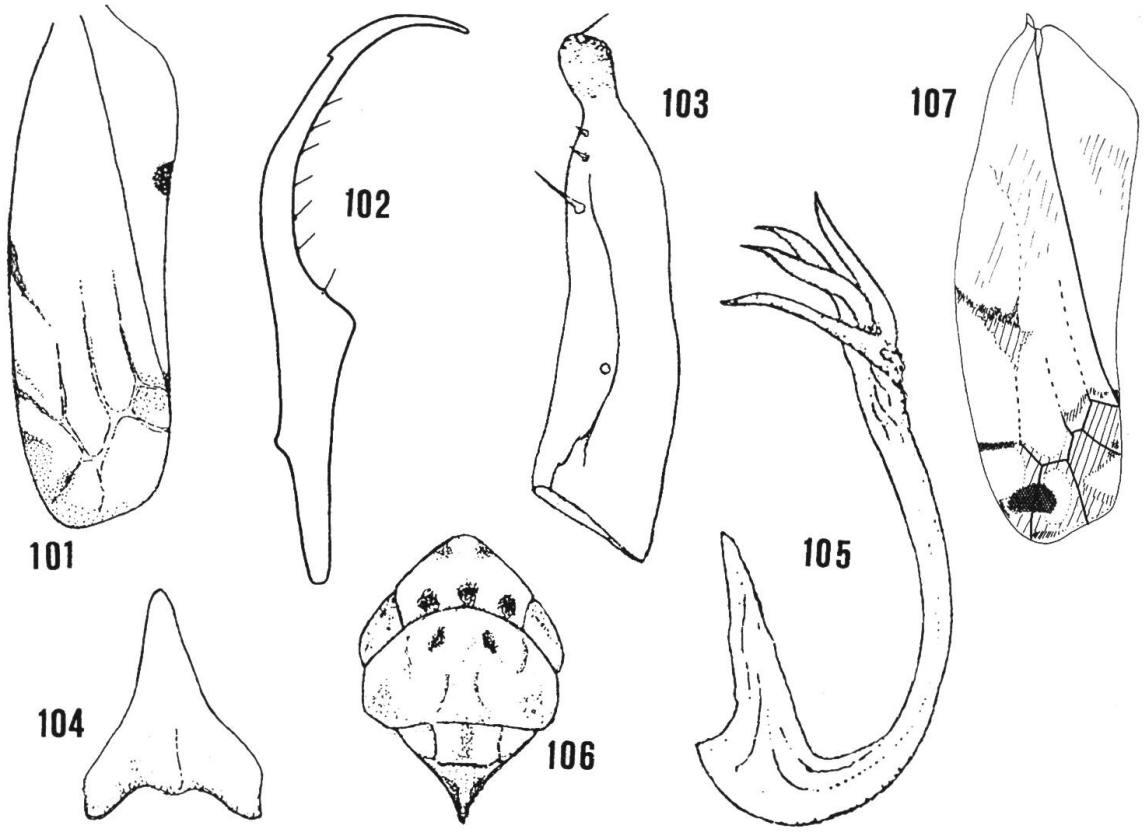
Material examined. Holotype ♀: Indonesia, Java, Dieng Plateau, 2000 m, shores of lake Telega Warna, 11. VII. 1990, I. Dworakowska leg. (SMTD). Paratypes: 3 ♀♀, same data as the holotype. (SMTD).

Description. Robust. Vertex and anterior part of pronotum ivory and posterior part of pronotum, scutum and scutellum yellow or whole vertex and dorsal side of thorax yellow. Face and ventral side of thorax with legs yellowish except protothoracic sternite which is sordid brown. Sides of abdominal sternites 3–6 sordid brown, sternite 7 pale. Abdominal tergites infuscate laterad of pale midline. Coleostron slightly infuscate, setae



Figs 92–100. *Eurhadina* (*Singhardina*) *rubra*, specimen from Borneo: 93 – penis, side view, 94 – penis, posterior view, 95 – paramere, on slide, 96 – proportions of sternite 9, connective, paramere and subgenital plate, on slide, 97 – male basal abdominal apodemes of sternite 3 (elongated, unpigmented) and tergite 3 (broad, with pigmentation denoted by diagonal lines) [tergites also pigmented], on slide, 98 – shape and pigmentation of pygofer, part of sternite 9 and base of anal tube, on slide, 99 – pygofer and basal part of anal tube, on slide, 100 – penis, dorsal view, basal section with single apodeme above.

whitish, apex of valvula blackish. Fore wing yellow except orange suffusion at costal margin basally and in posterior half of clavus, distal half of c cell and background of apical cells whitish and distal halfs of r, m and cua cells pinkish. Apical RP with a large blackish transverse patch (Fig. 107). Apex of clavus, Sc+RA and submarginal arch in



Figs 101–107. *Eurhadina* (*Singhardina*) *centralis*, after YANG & LI (1991) (101 modified), 102–104 – male genitalia, probably belong to other genus: 102 – paramere, 103 – right subgenital plate, ventral view, 104 – connective, 105 – penis, postero-lateral view [may belong to *Eurhadina* (*Singhardina*)]; *E.* (*S.*) *warna* sp.nov.: 107 – left fore wing of female, on slide.

apical cells dark brown, other areas marked by diagonal stripes in Fig. 107 brownish to brownish-beige. Wing margin pale yellowish apically.

Length ♀: 3.65–3.90 mm; fore wing 2.9 mm.

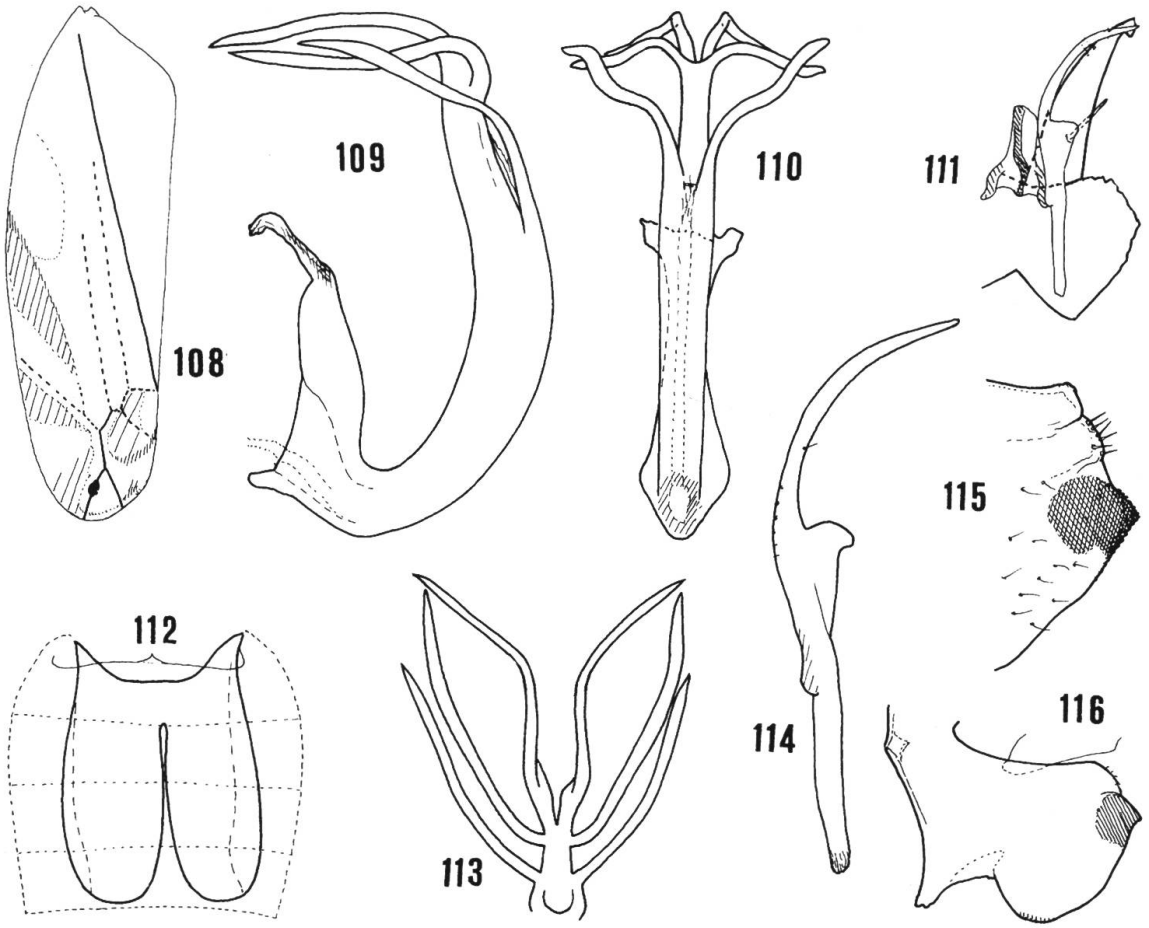
Differential diagnosis. The colouration pattern indicates that this new species is related to *E.* (*S.*) *rubra* and differs by predominantly yellow background and details of pigmented pattern (compare Fig. 107 with Fig. 92). Distinguishing the new species basing on female is sound in this case because the coloured pattern among relatives of *E.* (*S.*) *rubra* remains quite constant and in all known cases is consistent with species identity.

Eurhadina (*Singhardina*) *centralis* YANG et LI, 1991
(Fig. 101–106)

YANG & LI 1991: 26

Record published. China, Fujian, Dehua Co., Shuikou (YANG & LI 1991: 26).

Remarks. The illustrations of male genitalia in the original description (here Figs 102–104) seem to show other genus – probably *Baaora* DWORAKOWSKA.



Figs 108–116. *Eurhadina* (*Singhardina*) *chiengdaoa* sp.nov.: 109 – penis, side view, 110 – penis, posterior view, 111 – proportions of sternite 9, connective, paramere and subgenital plate, on slide, 112 – male basal abdominal apodemes of of sternite 3, on slide, 113 – apical part of penis, dorsal view, 114 – paramere, on slide, 115 – caudal part of pygofer, on slide, 116 – proportions and pigmentation of pygofer and basal segment of anal tube, on slide.

Yang Chi-kun allowed me to see the holotype, specimen with the abdomen removed. On the basis of colouring pattern and wing shape I assigned this species to the group of *E.* (*S.*) *punjabensis*. The infuscations at sides of scutellum are orange-ochre brownish and similar to the pattern in *E.* (*S.*) *variegata*, *E.* (*S.*) *quarta* and *E.* (*S.*) *fasciata* spp.nov.

***Eurhadina* (*Singhardina*) *chiengdaoa* sp.nov.**
(Figs 108–116)

Material examined. Holotype ♂: Thailand, Chiengmai Prov., Chieng Dao, January 1980, Aroon Samruadkit leg. (DOA). Paratype ♂: Thailand, Chaiaphum Prov, Pookiew January 1990, Aroon Samruadkit leg. (DOA).

Description. Head and thorax chalk white. Fore wing with very light brownish pattern (diagonally striped in Fig. 108). Blackish patch on apical RP comparatively large.

Length ♂: 3.00 and 3.20 mm.

Differential diagnosis. The new species differs from all known ones by its colouration and details of male genitalia. Penis (Figs 109, 110, 113) bears single ventral apical processes and double dorsal processes as in *E.* (*S.*) *nasti* and subgenital plate contour (Fig. 111) is as in *E.* (*S.*) *anurous* – both species showing characters of the group of *E.* (*S.*) *punjabensis*. However short connective (Fig. 111), caudal part of paramere broadened in the midlength and details of posterior part of pygofer (Figs 115, 116) differ *E.* (*S.*) *chiengdaoa* from all other species of this group.

Eurhadina (*Singhardina*) *cuii* HUANG et ZHANG, 1999

HUANG & ZHANG 1999: 251.

Record published. China, Fujian, San Gang (HUANG & ZHANG 1999: 251).

Eurhadina (*Singhardina*) *biavis* YANG et LI, 1991

YANG & LI 1991: 25.

Records published. China, Fujian, San Gang (YANG & LI 1991: 25); E China, Baishanzu Mt. (CAI & HE 1995: 98).

Eurhadina (*Singhardina*) *dazhulana* YANG et LI, 1991

YANG & LI 1991: 23.

Record published. China, Fujian, Jianyang Co., Dazhulan (YANG & LI 1991: 23).

Eurhadina (*Singhardina*) *exclamationis* YANG et LI, 1991

YANG & LI 1991: 23.

Record published. China, Fujian, San Gang (YANG & LI 1991: 23).

Eurhadina (*Singhardina*) *rubrovittata* CHIANG, HSU et KNIGHT, 1989

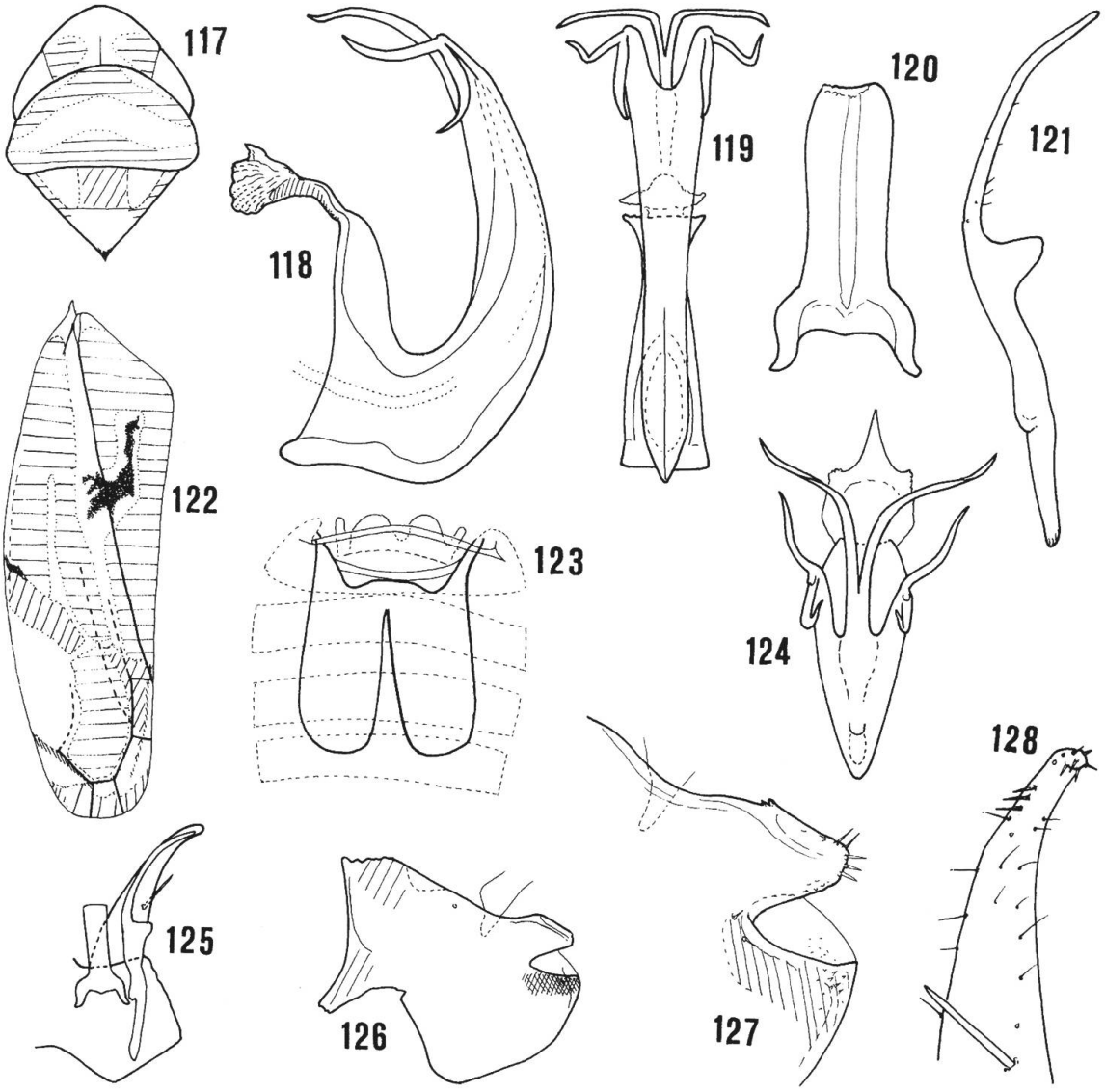
CHIANG et al. 1989: 125.

Record published. Taiwan, Nantou, Meifeng, 2130 m (CHIANG, HSU & KNIGHT 1989: 125).

Eurhadina (*Singhardina*) *wuyiana* YANG et LI, 1991

YANG & LI 1991: 26.

Record published. China, Fujian, San Gang (YANG & LI 1991: 26).



Figs 117–128. *Eurhadina* (*Singhardina*) *turkey* sp.nov.: 118 – penis, side view, 119 – penis – posterior view, 120 – connective, on slide, 121 – paramere, on slide, 122 – left fore wing of the holotype, on slide, 123 – male basal abdominal apodemes of sternite 3, on slide, 124 – penis, dorsal view, basal section above, 125 – proportions of sternite 9, connective, paramere and subgenital plate, on slide, 126 – shape and pigmentation of pygofer and basal part of anal tube, on slide, 127 – caudal part of pygofer, on slide, 128 – caudal 2/3 of subgenital plate, on slide.

The *Eurhadina* (*Singhardina*) *vittata* species group: *gedensis* sp.nov., *intanonica* sp.nov., *judoka* sp.nov., *ornata* sp.nov., *rubrania*, *tripunctata*, *turkey* sp.nov. and *vittata*.

Diagnosis. Colouration involves contrasting blackish patches and, usually, other bright colours (Figs 142, 151). The 3rd apical cell sessile (RP and MP' separate in apical cells) (Figs 8, 9). In pygofer no prominent tooth-like protrusion dorsally; when dorsal lobe is large the site of the protrusion is obliterated (Fig. 139), when it is narrow an angulate

expansion occupies the site of the protrusion (Fig. 157). Subgenital plate short in relation to the sternite 9 (Fig. 140). Connective long (Fig. 120). Penis with dorsal appendages not branched, ventral appendages bifurcate and gonopore drawn ventrad (Fig. 129). This group is not very sharply separate from the group of *E.* (*S.*) *punjabensis* and is distinguished rather for convenience of identification.

Eurhadina (*Singhardina*) *turkey* sp.nov.
(Figs 8, 117–128)

Material examined. Holotype ♂: N Borneo, Malaysia, SW Sabah, nr Long Pa Sia (East), 1000 m, Malaise trap, 25. XI–7. XII. 1982, C. van Achterberg leg. (NMNHL). Paratypes: 4 ♂♂, nr Long Pa Sia (West), 1050 m, 1–14. V. 1987, C. van Achterberg leg. (NMNHL).

Description. Face sordid whitish laterally, tan centrally; narrow transition face to vertex whitish. Vertex and pronotum creamy with orange-pinkish pattern as indicated by horizontal stripes in Fig. 117. Scutum and scutellum mostly whitish, lateral margins of scutum yellowish, centre sordid brownish, apex of scutellum blackish. Fore wing (Fig. 122) mostly sordid pinkish, but semitransparent whitish in cua cell, mesad of wax field, in apical 2/5 at costal margin and in proximal parts of 3rd and 4th apical cells. The diagonal stripes in Fig. 122 denote various shades of brown, dotted areas denote blackish.

Length ♂: 3.50–3.70 mm.

Differential diagnosis. Male genitalia slightly resemble *E.* (*S.*) *tripunctata* but differ considerably by slender apical penis processes (Figs 118, 119) and by rather narrow dorsal lobe in pygofer (Fig. 127).

Etymology. The species name is to be treated as Nominativus Substantivum; it derives from the shape of dark central patch on fore wing which in the holotype resembles the profile of wild turkey. The shape of the patch is as variable in this species as usually that kind of character is.

Eurhadina (*Singhardina*) *vittata* AHMED, 1969
(Figs 9, 10, 129–133)

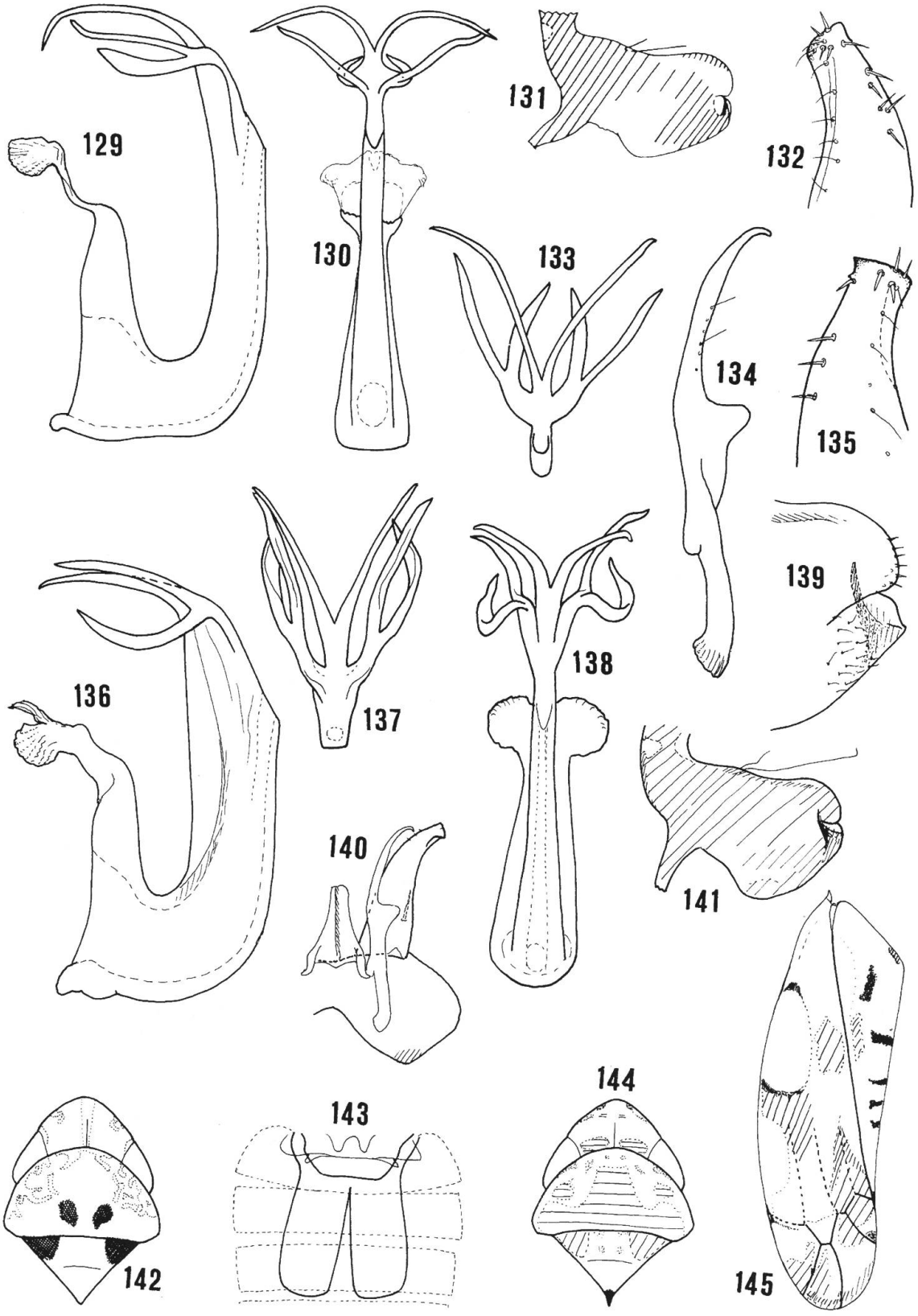
AHMED 1969: 317.

Records published. N Pakistan, Murree, on *Quercus dilatata* and *Aesculus indica* (AHMED 1969: 317); NW India, Jammu & Kashmir, Jammu div; NW India, H.P., Manali (DWORAKOWSKA 1982: 159).

Material examined. 1 ♂: NW India, J & K, base of Pirpanjal Mts, 450 m, Kishtwar, 33°17‘ N, 75°47’ E, VII. 1980, at light, B. Sharma leg; 2 ♂♂: N India, U.P. Naini Tal, 2100 m, lamp domes, 1990; 2 ♂♂, 1 ♀: Naini Tal, 2100 m, *Quercus*, 12. II; 3 ♂♂, 3 ♀♀, larvae, same data, 13. II. 1991, I. Dworakowska leg.

Eurhadina (*Singhardina*) *intanonica* sp.nov.
(Figs 134–143)

Material examined. Holotype ♂: Thailand, Chiengmai Prov., Intanon Mt., 9. IV. 1976, Aroon Samruadkit leg. (DOA). Paratype ♂: Fang [territory], Chiengmai, Lot 4117, 8. XI. 1988, V. Khuntong leg. (DOA).



Figs 129–145. *Eurhadina* (*Singhardina*) *vittata*: 129–133; *E.* (*S.*) *intanonica* sp.nov.: 134–143; *E.* (*S.*) *gedensis* sp.nov.: 144, 145. [for explanations see the preceding plates]

Description. Face sordid whitish. Vertex and pronotum ivory with light reddish-orange suffusion, caudal part of pronotum with two large blackish patches. Scutum and scutellum light beige laterally; centre of scutum slightly orange, centre of scutellum ochre-yellow; basal triangles and surrounding areas blackish. Fore wing greyish with reddish suffusion, wax-field whitish creamy bearing a small dark mark at its proximal end. Hind margin of clavus bordered with reddish, a large blackish patch centrally on the level of claval angle, surrounded with whitish.

Length ♂: 3.80 mm.

Differential diagnosis. The colouration as well as male genitalia (Figs 134–141) indicate close similarity to *E.* (*S.*) *vittata* (Figs 129–133).

Eurhadina (*Singhardina*) *rubrania* HUANG et ZHANG, 1999

HUANG & ZHANG 1999: 246.

Record published. China, Hunan, Chen-zhou, Mang-shan (HUANG & ZHANG 1999: 246).

Eurhadina (*Singhardina*) *gedensis* sp.nov.
(Figs 144, 145)

Material examined. Holotype ♀: Indonesia, W Java, Gunung Gede, 1600–1800 m, 5. VII. 1990, I. Dworakowska leg. (SMTD). Paratypes. 6 ♀♀, same data as the holotype. (SMTD, MM, The Hungarian Natural History Museum, Budapest).

Description. Robust. Whitish, horizontal lines in Fig. 144 denote bright orange on vertex, orange-ochre on pronotum; dotted areas denote brownish. Scutum and scutellum ochre-yellow, basal triangles sordid brown; apex of scutellum blackish.

Fore wing (Fig. 145) whitish with rosy predominating on proximal and on distal parts of corium, yellowish on proximal part of clavus and orange on its distal part and subapically in longitudinal cells. The areas marked by diagonal stripes in Fig. 145 denote light brown to brown or sordid brownish; chequered ones denote dark brown to blackish.

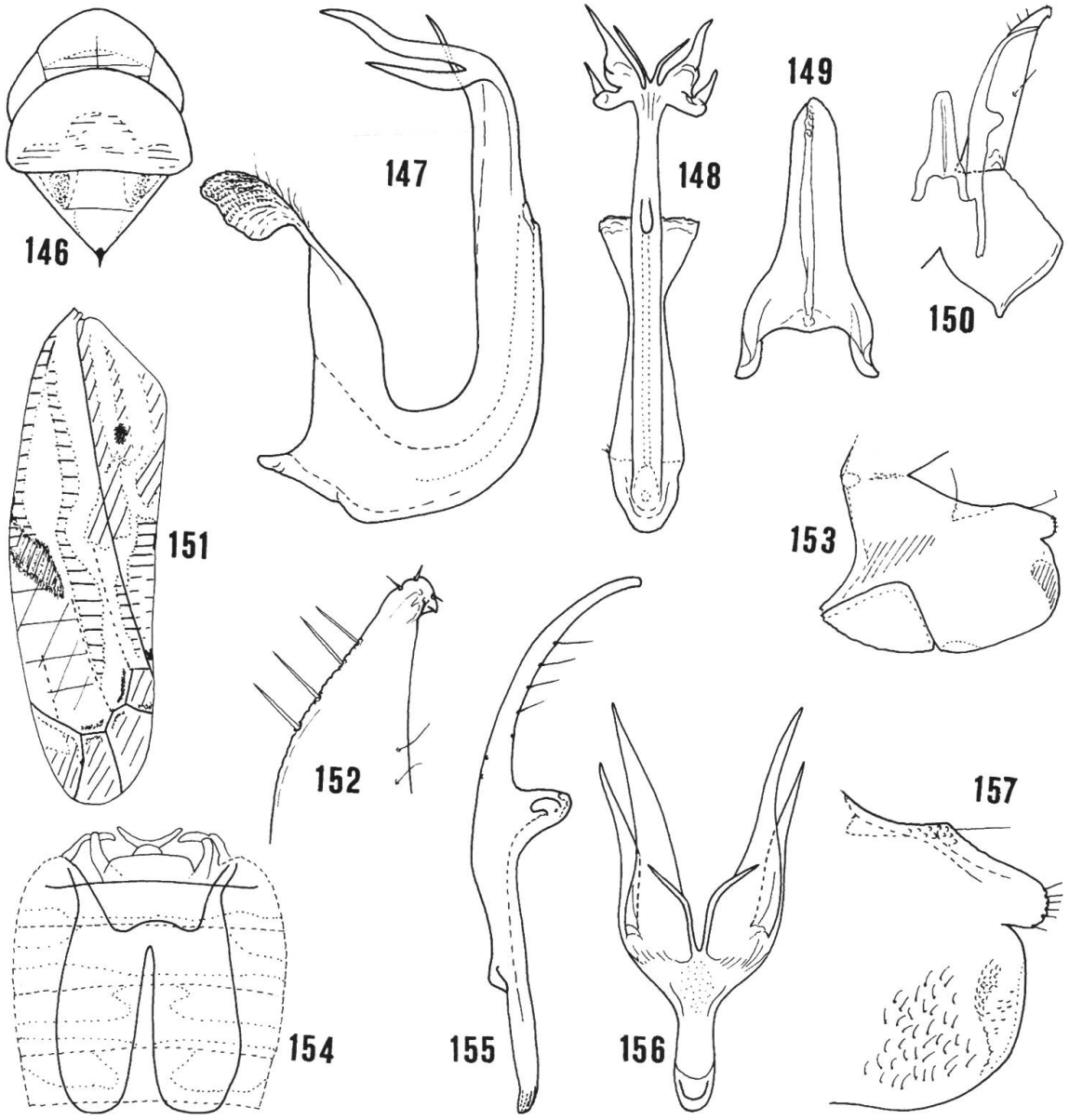
Length ♀: 3.75–4.00 mm (fore wing 3.05 mm).

Differential diagnosis. The general pattern of colouration slightly rsembles *E.* (*S.*) *rubrania*, especially fore wing with its transverse incomplete fasciae at commissural margin of clavus. Details of pattern in the former species are, however, different enough to justify distinguishing the new species. The main differences between the two species are longitudinal orange streaks on vertex in *E.* (*S.*) *rubrania*, blackish marks on postero-lateral angles of pronotum and large infuscate areas on fore wing.

Eurhadina (*Singhardina*) *ornata* sp.nov.
(Figs 11, 12)

Material examined. Holotype ♀: Indonesia, Central Java, Dieng Plateau, 2000 m, shore of lake Telega Warna, 11. VII. 1990, I. Dworakowska leg. (SMTD).

Description. Vertex and dorsal side of thorax light yellow (the areas marked by horizontal stripes in Fig. 12 denote orange on vertex, ochre on pronotum). Two large



Figs 146–157. *Eurhadina* (*Singhardina*) *judoka* sp.nov.: 147 – penis, side view, 148 – penis, posterior view, 149 – connective, on slide, 150 – proportions of sternite 9, connective, paramere and subgenital plate, on slide, 152 – apical part of subgenital plate, on slide, 153 – proportions and pigmentation of pygofer, basal part of anal tube and small fragment of sternite 9, on slide, 154 – male basal abdominal apodemes of sternite 3 (pigmented cephalic parts of tergites outlined by interrupted lines), on slide, 155 – paramere, on slide, 156 – apical part of penis, dorsal view, 157 – caudal part of pygofer, on slide.

brown patches on pronotum posteriorly. Scutum and scutellum ochre-yellow, basal triangles light brown (dotted areas in Fig. 12 denote brownish), small patches laterally at scutum-scutellum border and apex of scutellum blackish.

Fore wing (Fig. 11) yellowish; yellow on wax-field and on caudal third of clavus, whitish on apex of r cell and in apical cells. The diagonal stripes in Fig. 11 denote light brownish-tan to brownish; dotted areas denote various shades of dark brown to blackish.

Length ♀: 3.65 mm (fore wing 3.00 mm).

Differential diagnosis. The contasting colouration and 3rd apical cell sessile indicate relation to *E.* (*S.*) *vittata* group. Details of colouring pattern show close similarity to *E.* (*S.*) *gedensis*. The single specimen resemble the previous species so closely as if it was only its darkly coloured form. However, inconspicuous dot on RP vein in this specimen and scarce transverse fasciae on clavus (Fig. 11) with no intermediate colour forms among 7 specimens of *E.* (*S.*) *gedensis* are inconsistent with the expression of merely darker pigmentation of the same pattern. Also presence of blackish patches on scutum-scutellum border (Fig. 12) may show its own specific character of. *E.* (*S.*) *ornata* rather than be an expression of darker pigmentation of the same pattern as in *E.* (*S.*) *gedensis*.

Eurhadina (*Singhardina*) *judoka* sp.nov.

(Figs 146–157)

Material examined. Holotype ♂: Thailand, Fang, 19°55'N, 99°12' E, 300 m, at light, 25. V. 1991, V. Kubáň leg. (MM).

Description. Dorsal side of body beige, centre and posterior part of pronotum, scutum and scutellum lighter. Areas marked by horizontal stripes in Fig. 146, orange. Apex of scutellum blackish. Fore wing light beige at base of clavus, sordid beige on most of corium, whitish in apical cells. Areas marked by diagonal stripes in Fig. 151 denote various shades of brownish, these marked by horizontal stripes denote sordid orange or sordid reddish, in distal half of r cell reddish suffusion. Large brown patch caudad of distal end of wax-field. The dark patch in middle of proximal half of clavus, dash on its commissural margin, mark near clavus apex, spot on RP and other thickly dotted marks in Fig. 151, blackish.

Length ♂: 3.25 mm.

Differential diagnosis. Male genitalia unique by the lamellate dorsal branch of ventral penis appendages (Fig. 156). The new species shows similarity with *E.* (*S.*) *rubrania* by subgenital plate structure (pointed apical protrusion Fig. 152), angulate dorsal margin of pygofer (Figs 153, 157) and minute dorsal penis appendages (Figs 147, 148, 156). It differs, however, from the previous species by penis processes differently shaped, large male basal abdominal apodemes (Fig. 154) and by colouring pattern.

Eurhadina (*Singhardina*) *tripunctata* HUANG et ZHANG, 1999

HUANG & ZHANG 1999: 254

Record published. China, Fujian, Jian-yang, Huang-keng (HUANG & ZHANG 1999: 254).

The *Eurhadina* (*Singhardina*) *mamata* species group:

acapitata, *brevis* sp.nov., *flavistriata*, *interrupta* sp.nov., *jarrayi* sp.nov., *liue* sp.nov., *mamata*, *pallida* sp.nov., *prima* sp.nov., *secunda* sp.nov., *univira* sp.nov., *yingfengica* sp.nov. and *zhengi* sp.nov.

Diagnosis. Colouration sordid whitish. On vertex and pronotum often yellow or orange patches or fasciae (Fig. 189), marked in the following illustrations by horizontal stripes, on pronotum brown transverse fascia. Scutum with various infuscations. Scutellum with two blackish subapical marks laterally. Usually large brown areas on clavus and adjacent part of corium, infuscation in apical cells and diagonal streaks at costal margin of fore wing; various shades of beige to brown marked in the following illustrations by diagonal stripes, brownish-black or blackish thickly dotted or chequered.

In male genitalia pygofer bears large dorsal lobe and small ventral one; the ventral lobe or both pigmented caudally (Fig. 169, 171). Subgenital plate uniformly shaped (Fig. 6) with numerous microsetae on its ventral apical third and differentiated smaller microsetae more apicad (Figs 170, 192, 208, 232). Caudal part of paramere distinctly shorter than the length of remaining two parts combined (Fig. 167). Connective short (Figs 217, 226). Penis with single dorsal processes and bifurcate ventral processes of which ventral (outer in dorsal view) branch tends to be smaller. Basal abdominal apodemes narrow and apart basally (Figs 172, 255). All species known at present in this group show close similarity to one another at the same time distinct differences, both in external appearance and in male genitalia.

Eurhadina (*Singhardina*) *mamata* Dworakowska, 1981
(Figs 4–7, 14, 158–161)

Dworakowska 1981: 601.

Record published. NE Pakistan, Murree; Nepal, Kathmandu Valley (Dworakowska 1982: 159).

Eurhadina (*Singhardina*) *zhengi* sp.nov.
(Figs 162–172)

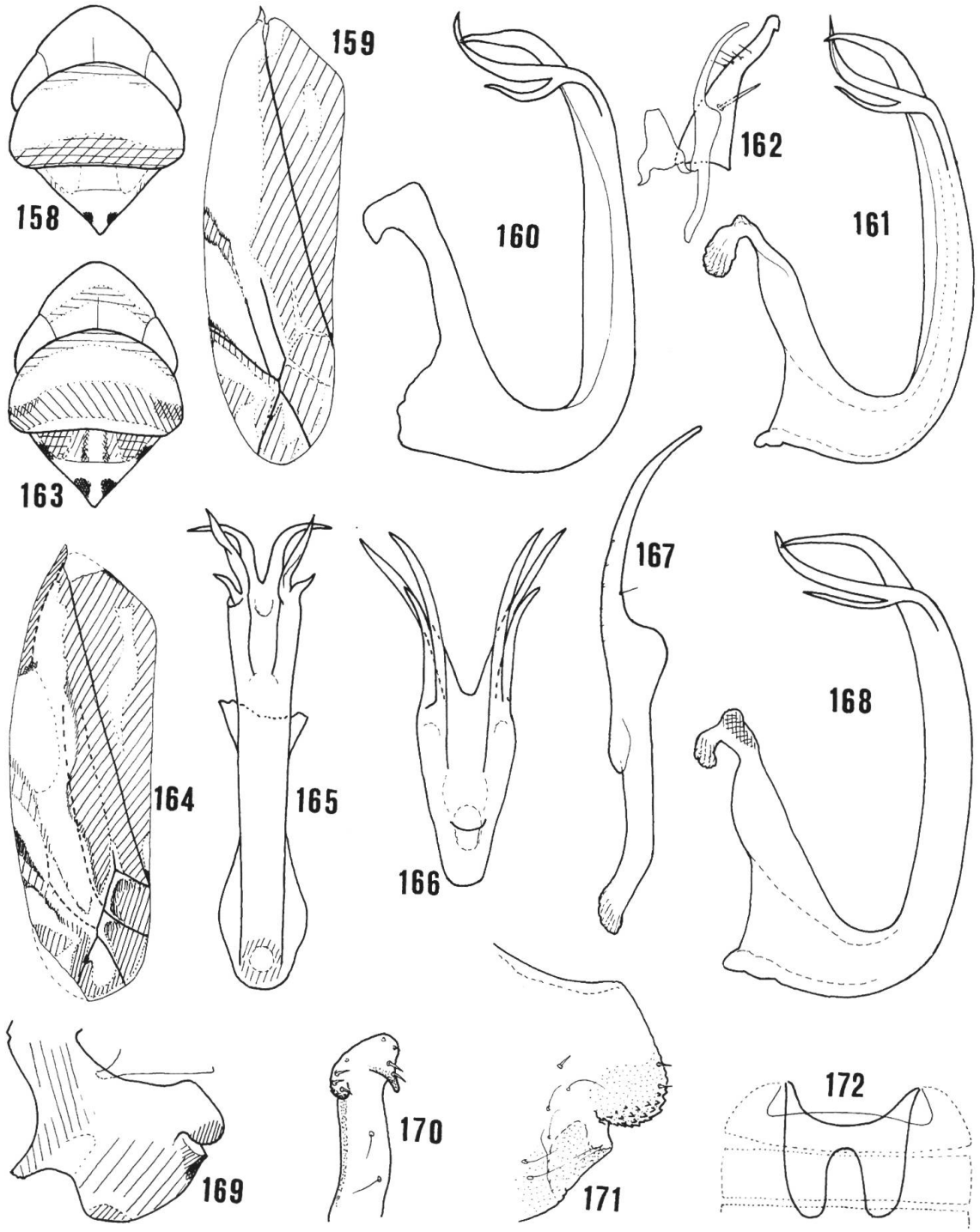
Material examined. Holotype ♂: Thailand, Chaiyaphum Prov, Pookiew, January 1980, Aroon Samruadkit leg. (DOA).

Description. Dorsal side of body white. Sides of face below bases of antennae and frontoclypeus except a narrow white stripe apically, blackish brown; anteclypeus sordid yellow. Transverse fasciae on vertex and pronotum (Fig. 163) orange; the broad one on pronotum, brown. Scutum partly brownish-ochre with dark brown marks; scutellum with large blackish marks. Fore wing whitish with brown pattern as in Fig. 164, wax-field and distal part of c cell yellow.

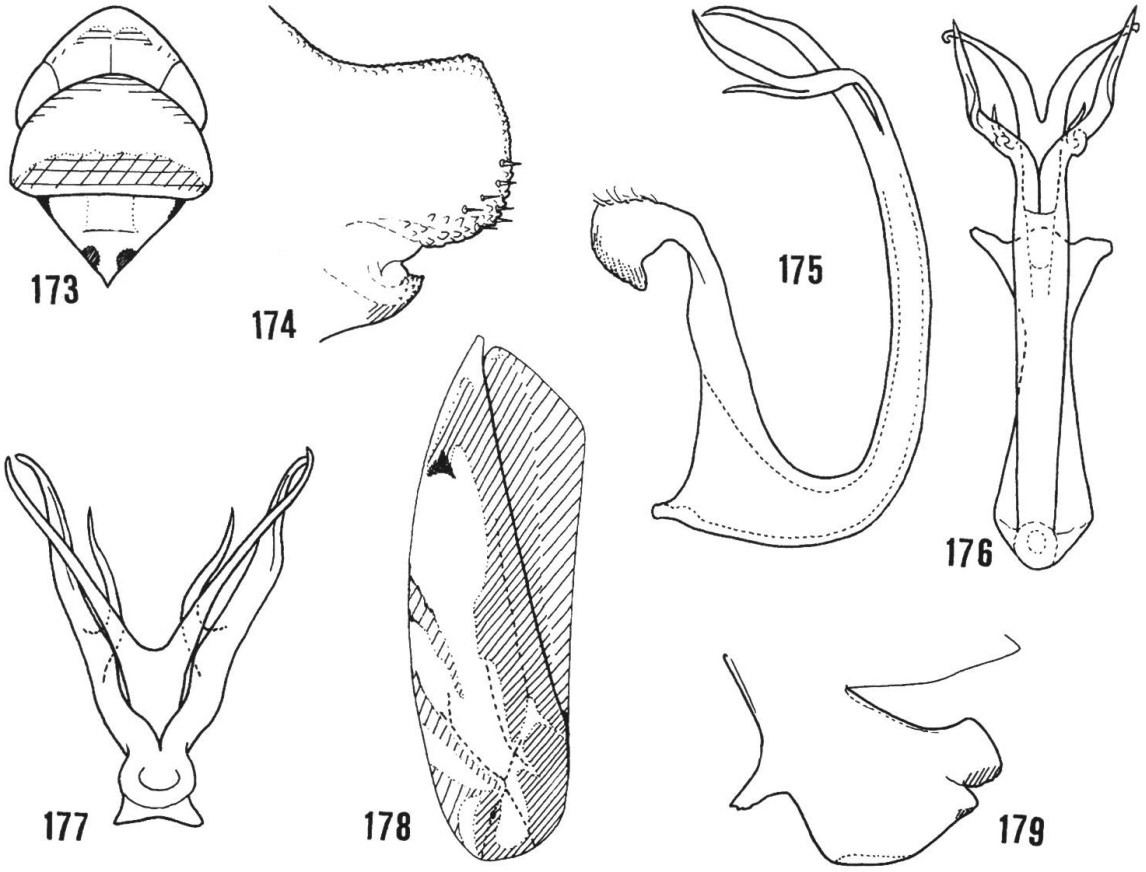
Length ♂: 3.30 mm.

Differential diagnosis. This species is the most similar to *E.* (*S.*) *mamata* differing by external characters (compare Figs 158, 159 with Figs 163, 164) and by male genitalia (compare Figs 160, 161 with Figs 165, 168).

The new species is named in honour of heteropterist Dr. Zheng, Le-yi of the Nankai University (P. R. China).



Figs 158–172. *Eurhadina* (*Singhardina*) *mamata*: 158–161; *E.* (*S.*) *zhengi* sp.nov.: 162–172, 170 – apical part of subgenital plate (characteristic for all species of the group of *E.* (*S.*) *mamata*). [for other explanations see the preceding plates]



Figs 173–179. *Eurhadina* (*Singhardina*) *univira* sp.nov.: 173 – head and thorax, dorsal view, 174 – caudal part of pygofer, on slide, 175 – penis, side view, 176 – penis, posterior view, 177 – apical part of penis, dorsal view, 178 – left fore wing, on slide, 179 – proportions and pigmentation of pygofer and anal tube, on slide.

Eurhadina (*Singhardina*) *univira* sp.nov.

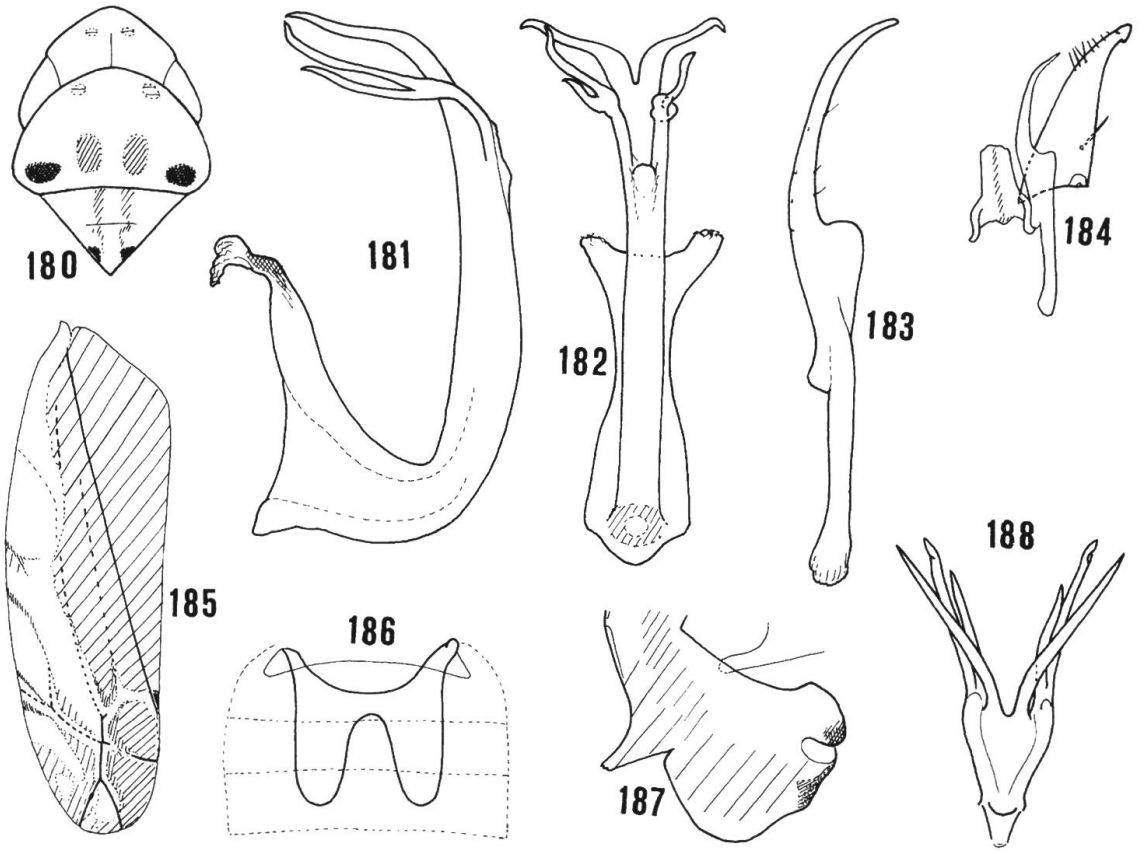
(Figs 173–179)

Material examined. Holotype ♂: Thailand, Chiengmai Prov., Doi Ang Khang, April 1979, A. Samruadkit leg. (DOA).

Description. Vertex ivory, dorsal side of thorax creamy. Orange and brown to blackish-brown pattern as in Fig. 173, the broad fascia on pronotum light brownish-ochre. The pattern on fore wing (Fig. 178) light to dark brown; the patch at proximal end of wax-field, dot on RP, tip of clavus and commissural margin of 1st apical cell, blackish.

Length ♂: 3.60 mm.

Differential diagnosis. Male genitalia resemble *E.* (*S.*) *mamata* but dorsal lobe of pygofer (Fig. 174) longer, penis stem narrower in profile (Fig. 175) and its apical ventral process lamellate basally, with its ventral branch sinuate and drawn mesad (Figs 176, 177).



Figs 180–188. *Eurhadina* (*Singhardina*) *jarrayi* sp.nov.: 180 – head and thorax, dorsal view, 181 – penis, side view, 182 – penis, posterior view, 183 – paramere, on slide, 184 – proportions of connective, paramere and subgenital plate (misplaced), on slide, 185 – left fore wing, on slide, 186 – male basal abdominal apodemes of sternite 3, on slide, 187 – shape and pigmentation of pygofer and base of anal tube, on slide, 188 – apical part of penis, dorsal view.

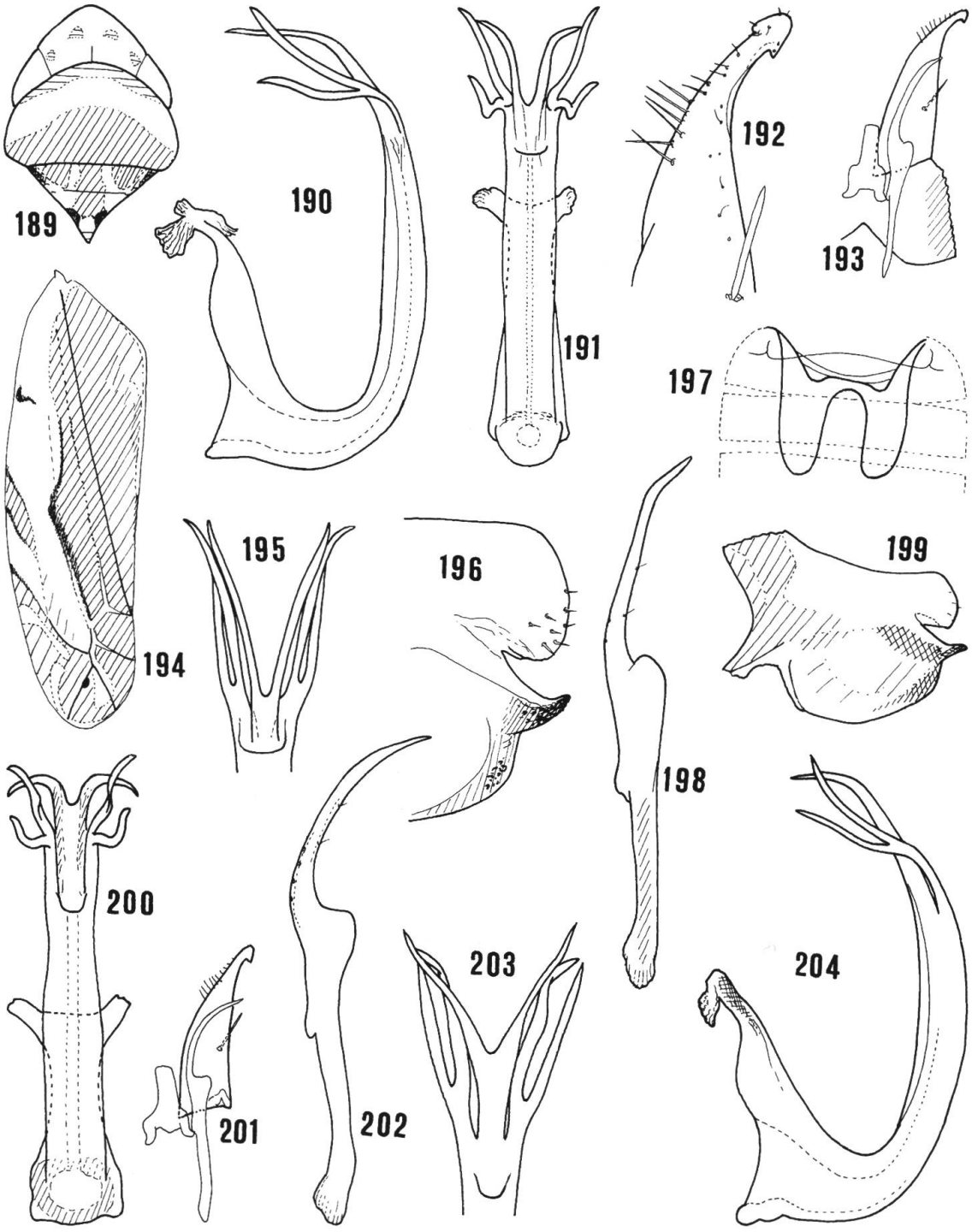
Eurhadina (*Singhardina*) *jarrayi* sp.nov.
(Figs 180–188)

Material examined. Holotype ♂: Thailand, Chiengmai, 9. IV. 1976, Aroon Samruadkit leg. (DOA).

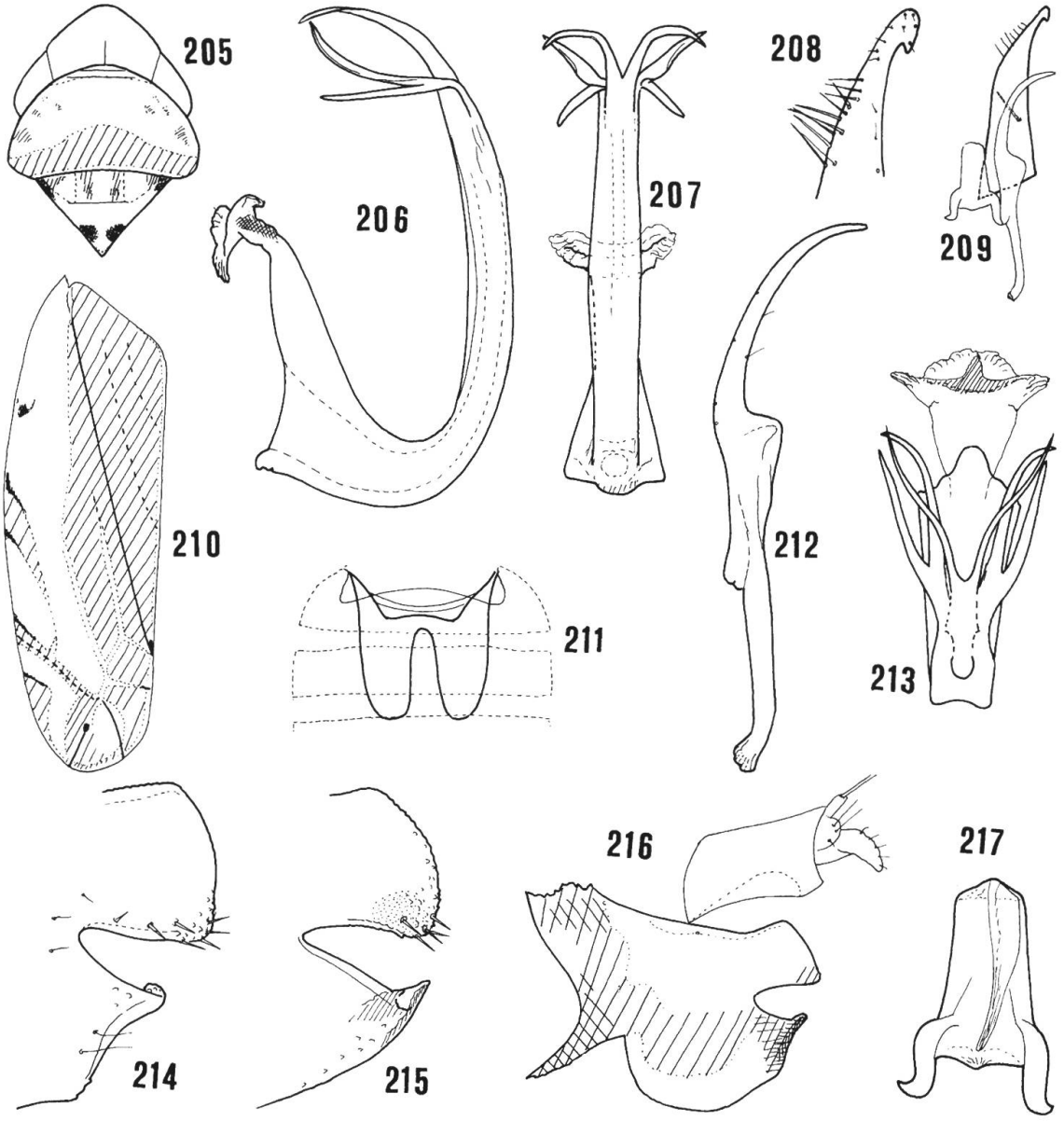
Description. Head and pronotum whitish, scutum and scutellum sordid yellowish. Two third of frontoclypeus below bases of antenne dark brown. Patches on vertex (Fig. 180) citrine yellow, those on pronotum orange, brown or blackish-brown respectively. Scutum with indistinct infuscation in the middle. Fore wing white, with light brown to brown pattern as in Fig. 185.

Length ♂: 3.80 mm.

Differential diagnosis. Male genitalia resemble *E.* (*S.*) *mamata* very much but dorsal lobe of pygofer (Fig. 187) smaller, all penis processes (Figs 181, 182, 188) slimmer and longer and the ventral branches of the ventral processes drawn mesad as in *E.* (*S.*) *univira*.



Figs 189–204. *Eurhadina* (*Singhardina*) *interrupta* sp.nov.: 189–199; *E.* (*S.*) *secunda* sp.nov.: 200–204. [for other explanations see the preceding plates]



Figs 205–217. *Eurhadina* (*Singhardina*) *brevis* sp.nov.: 208 – apical part of subgenital plate, on slide, 209 – proportions of connective, paramere and subgenital plate (misplaced), on slide, 211 – male basal abdominal apodemes of sternite 3, on slide, 212 – paramere, on slide, 213 – penis, dorsal view, basal section above, 214 and 215 – caudal part of pygofer, on slide, 216 – shape and pigmentation of pygofer and anal tube, on slide, 217 – connective, on slide.

Eurhadina (*Singhardina*) *interrupta* sp.nov.

(Figs 189–199)

Material examined. Holotype ♂: N Borneo, Malaysia, S Sabah, Beaufort, 105 km S of Long Pa Sia area confl. Pa Sia – Matang, 100 m, 4°24 ' N, 115°43' E, semicultivated area, at light, 10. IV. 1987, J. van Tol & J. Huisman leg. (NMNHL). Paratypes: 1 ♂, same data as the holotype; 7 ♂♂, same locality, 13. IV; 6 ♂♂, same locality, 5. IV; 1 ♂, same locality, 3. IV; 1 ♂, same locality, 1. IV, all collected by J. van Tol & J. Huisman in 1987; 1 ♂: Sabah, Kg Long Pa Sia, airstrip, ML light, 1000m, 4°24' N, 115°43' E, 15. IV. 1987, J. Huisman leg.; 15 ♂♂, Long Pa Sia airstrip along S Pa Sia, 1090 m, 4°25' N, 115°43' E, 14. X. 1986, J. Huisman et al

leg.; 2 ♂♂: Sarawak, 10 km N of Bario, Kg Pa Lungan, Sg. Pa Lungan, 1100 m, 3°48' N, 115°34' E, ML light, 18. II. 1987, J. Huisman leg.; 1 ♂: 16 km N of Bario, Long Rapun, Sg. Dapur, 1200 m, 3°53' N, 115°35' E, ML, 19–20. II. 1987, J. Huisman leg. (NMNHL).

Description. Vertex sordid whitish to light beige with four orange patches. Pronotum with orange fascia anteriorly and brown one posteriorly (Fig. 189). Anterior angles of scutum dark brown, basal triangles and centre of scutum as well as centre of scutellum brown, apex of scutellum yellowish. Fore wing white, with brown pattern as in Fig. 194.

Length ♂: 3.60–4.00 mm.

Differential diagnosis. Male genitalia very similar to *E.* (*S.*) *mamata* but dorsal pygofer lobe relatively small (Figs 196, 199), dorsal penis processes long and almost straight and the ventral ones long and their branches diverging from one another in liraeform manner (Figs 190, 191, 195); paramere (Fig. 198) with narrower caudal part.

Eurhadina (*Singhardina*) *secunda* sp.nov.

(Figs 200–204)

Material examined. Holotype ♂: Thailand, Chaiyaphum Prov., Pookiew, January 1980, Aroon Samruadkit leg. (DOA).

Description. Head and thorax white. Two large patches on anterior part of vertex and four others along anterior margin of pronotum orange-yellow. Broad transverse fascia at hind margin of pronotum yellowish-brown. Fore wing whitish with light brown pattern occupying clavus except its apical and commissural parts, cua and m cells except their basal parts, apical 1st and 2nd cell and area around blackish dot on RP which joins submarginal stripe in 3rd apical cell as well as subcostal patch in 4th apical cell and infuscation in c cell basad of Sc+RA; another diagonal infuscate streak apicad of distal end of wax-field.

Length ♂: 3.00 mm.

Differential diagnosis. Male genitalia resemble *E.* (*S.*) *interrupta* but penis stem in profile broader (Fig. 204), its dorsal processes shorter as if fused with each other basally (Figs 200, 203) and caudal part of paramere (Fig. 202) arcuate, broadened subapically and tapering to the acute apex.

Eurhadina (*Singhardina*) *brevis* sp.nov.

(Figs 205–217)

Material examined. Holotype ♂: N Borneo, Malaysia, Sarawak, 16 km N of Bario, Long Rapun, Sg. Dapur, 1200 m, 3°, 53 ' N, 115°35'E, ML, 19–20. II. 1987, J. Huisman leg. (NMNHL). Paratypes: 3 ♂♂, same data as the holotype; 1 ♂: 10 km N of Bario, Kg. Pa Lungan, Sg. Pa Lungan, 1100 m, 3°48' N, 115°34' E, ML light, 18. II; 1 ♂: trail Pa Lungan – Long Rapun, 1200 m, 3°53' N, 115°35' E, 23. II, all collected by J. Huisman in 1987; 8 ♂♂: Sabah, Long Pa Sia airstrip along S. Pa Sia, 1090 m, 4°25' N, 115°43' E, at light, 14. X. 1986, J. Huisman et al leg.; 1 ♂: Long Pa Sia, banks of S. Pa Sia, 1090 m, 4°25' N, 115°43' E, secondary vegetation, 14–28. X. 1986, J. Huisman leg.; 5 ♂♂: S Sabah, Beaufort, 105 km S of Long Pa Sia area, confl. Pa Sia – Matang, 1000 m, 4°24' N, 115°43' E, semicultivated area, at light, 13. IV. 1987, van Tol & Huisman leg.; 2 ♂♂, same locality, 5. IV. 1987, J. van Tol & J. Huisman leg. (NMNHL).

Description. Head and dorsal side of thorax whitish with orange fascia on pronotum anteriorly and brownish-olive one posteriorly; other infuscations as in Fig. 205. Fore wing mostly white on costal half and mostly light brown with olive tint on commissural half (Fig. 210), margins of claval angle and most of commissural margin whitish.

Length ♂: 3.25–3.40 mm.

Differential diagnosis. Male genitalia resemble *E.* (*S.*) *interrupta* differing by longer dorsal pygofer lobe (Figs 214–216), dorsal penis processes arcuate in side view (Fig. 206) and sinuate in dorsal view (Fig. 213), ventral branch of ventral penis process straight (Figs 206, 207) and caudal part of paramere (Fig. 212) broad and arcuate (compare with Fig. 198).

Eurhadina (*Singhardina*) *flavistriata* YANG et LI, 1991
(Figs 218–220)

YANG & LI 1991: 27.

Record published. China, Fujian, Dehua Co., Shuikou (YANG & LI 1991: 27).

Remarks. The original illustrations are imprecise, these copied here are slightly modified following examination of the holotype, female. In the holotype there are two light ochre-yellowish patches on anterior part of vertex; on pronotum two larger patches anteriorly mesad of eyes and a narrow brownish transverse fascia parallel to its posterior margin. Pattern on fore wing of the holotype is more similar to the original illustration of habitus (Fig. 218 here) than to the original Fig. 34 showing the wing (copied and slightly modified here Fig. 219).

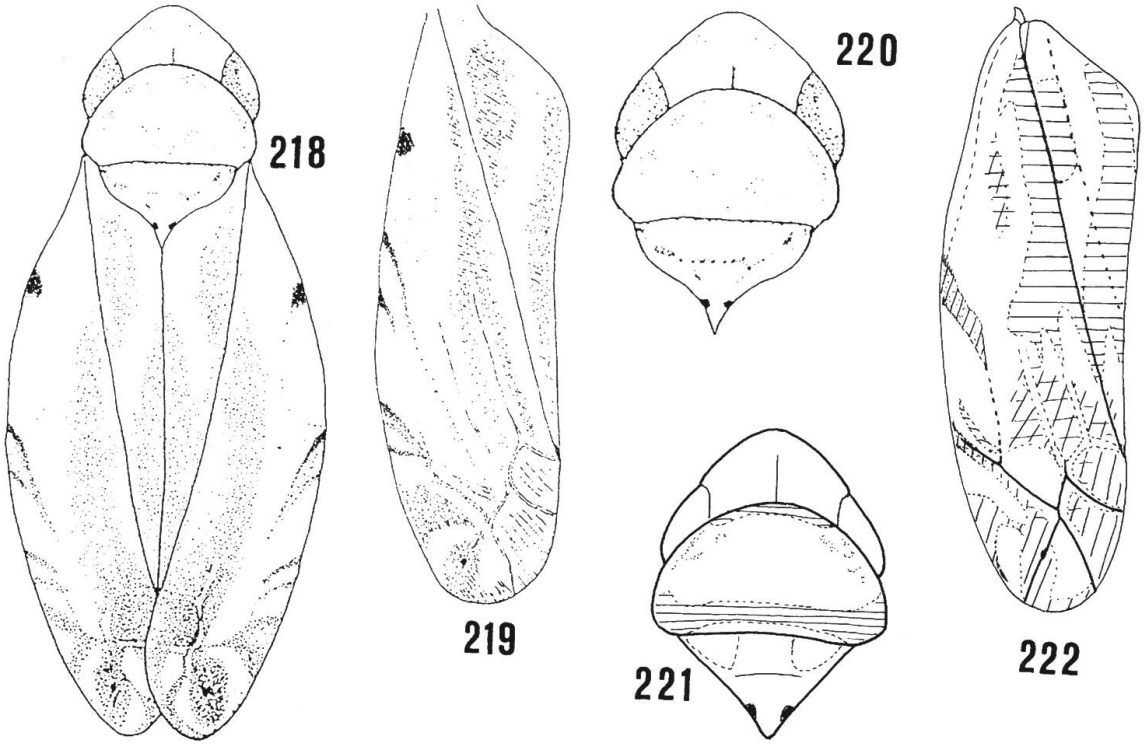
Eurhadina (*Singhardina*) *liue* sp.nov.
(Figs 221, 222)

Material examined. Holotype ♀: Nepal, Kathmandu Valley, Godawari, 29. X. 1991, I. Dworakowska leg. (SMTD).

Description. Head and dorsal side of thorax white. Pronotum with a narrow yellow fascia on its anterior margin between eyes and a broad yellow fascia (orange in midline) posteriorly (Fig. 221). Fore wing whitish with yellow-brownish pattern of broad longitudinal stripes on clavus and in cua and m cells as indicated by horizontal stripes in Fig. 222; the oblique streaks at costal margin brown, pattern in apical cells brownish while the infuscation in posterior parts of longitudinal cells (cua, m and r) brownish with yellowish tint.

Length ♀: 3.50 mm (fore wing 2.80 mm).

Differential diagnosis. The new species resembles *E.* (*S.*) *flavistriata* the closest; it differs, however, by the yellow and brownish pattern differently shaped. Vertex in the new species is unicoloured and there is a narrow fascia on pronotum anteriorly instead of two separate patches; posterior fascia on pronotum broad and the yellow fascia on clavus occupies almost whole length of commissural margin while in *E.* (*S.*) *flavistriata* it does not reach claval angle (the Fig. 219 is with an error and rather Fig. 218 shows the



Figs 218–222. *Eurhadina* (*Singhardina*) *flavistriata*: 218–220 (female), after YANG & LI (1991) (219 modified in the apical part); *E.* (*S.*) *liue* sp.nov.: 221–head and thorax of female, dorsal view, 222 – left fore wing of female (the pattern seen on clavus is similar to that of *E.* (*S.*) *flavistriata*, but this is misleading because the Fig. 219 shows the pattern on clavus of this species incorrectly).

pattern on fore wing more correctly). Additionally absence of blackish patch at wax-field and distinct infuscations in posterior parts of longitudinal cells (Fig. 222) allow to distinguish the new species without reasonable doubt.

The name derived from the family name of Chinese student Ms Ruiying Liu.

Eurhadina (*Singhardina*) *yingfengica* sp.nov.

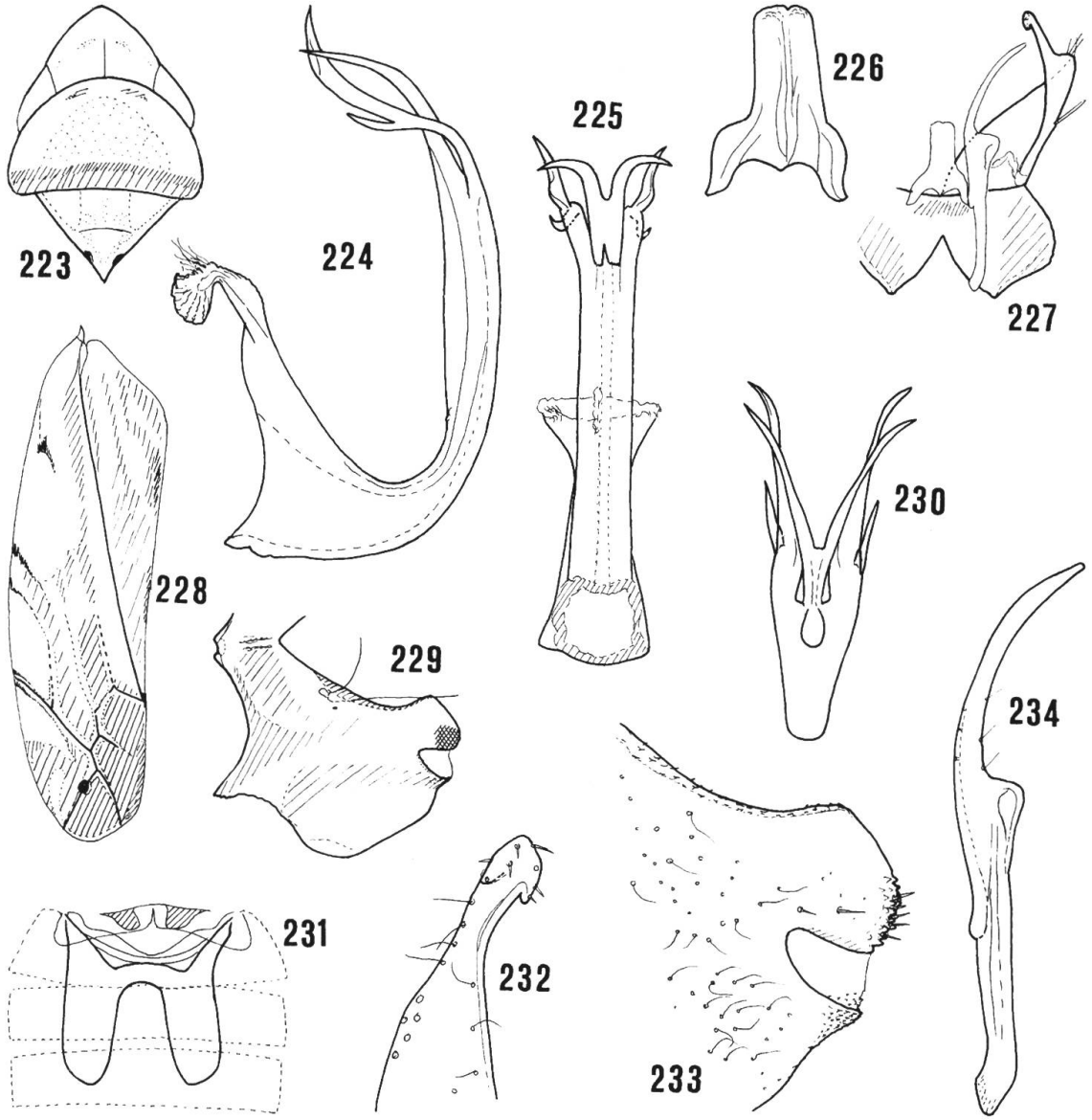
(Figs 223–234)

Material examined. Holotype ♂: Taiwan, 15 km W of Ying-feng, 2550 m, 16. VIII. 1990, I. Dworakowska leg. (SMTD).

Description. Slim. Vertex produced anteriorly. Frontoclypeus below bases of antennae, lorae and adjacent parts of genae as well as prothoracic sternite sordid brown. Dorsal side of body whitish. Pronotum with an indistinct orange suffusion anteriorly, greyish centrally and with a narrow brown to light brown transverse fascia subterminally; other infuscations as in Fig. 223. Fore wing whitish with most of its surface suffused with brown; spot on RP relatively large (Fig. 228).

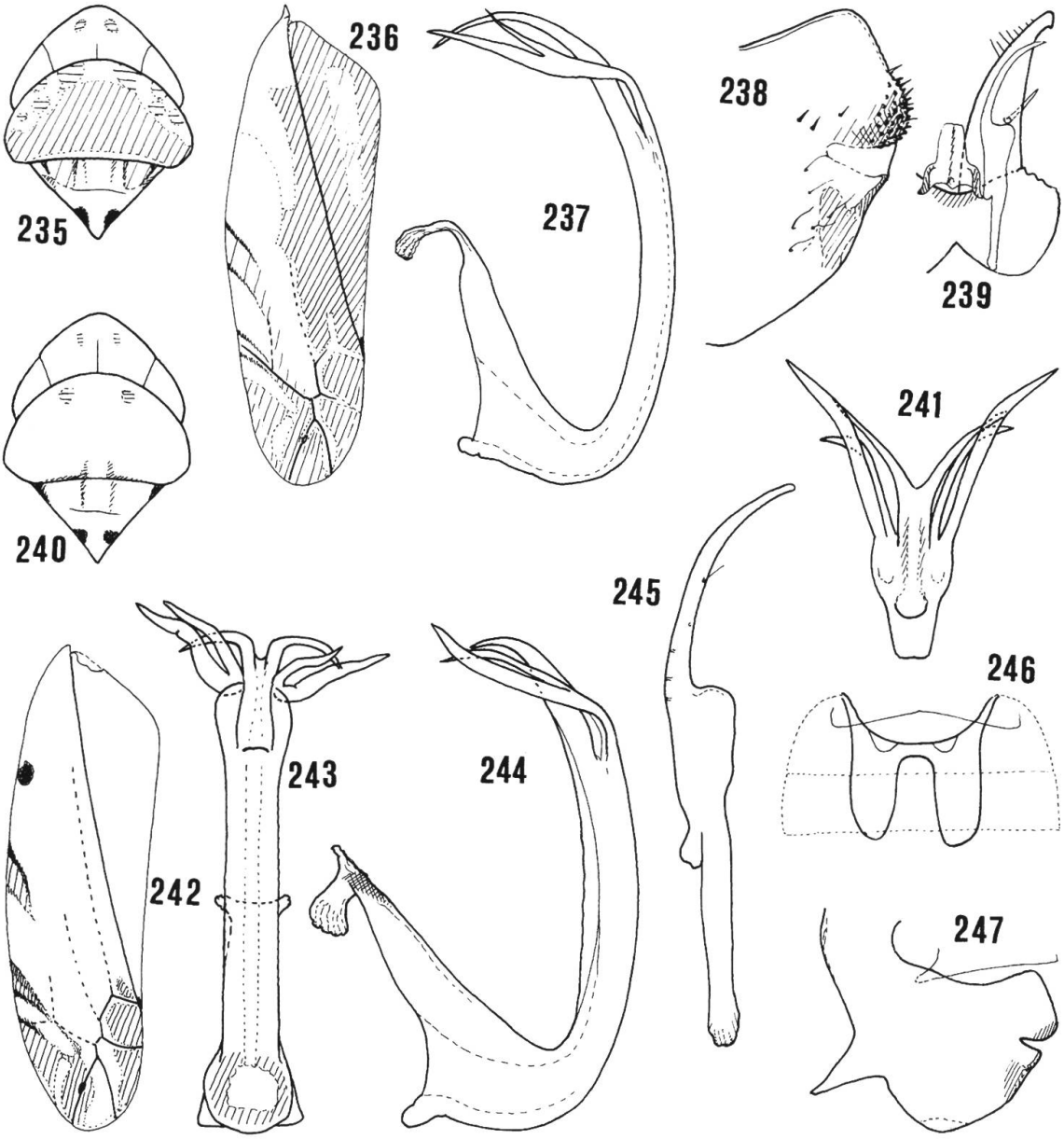
Length ♂: 3.90 mm.

Differential diagnosis. The new species resembles *E.* (*S.*) *mamata* but externally differs by body slimmer, size larger and colouration of fore wing darker. Male genitalia of *E.*



Figs 223–234. *Eurhadina* (*Singhardina*) *yingfengica* sp.nov.: 226 – connective, on slide, 227 – proportions and pigmentation of sternite 9, connective, paramere and subgenital plate (lateral and apical part of subgenital plate folded dorsad), on slide, 229 – proportions and pigmentation of pygofer and base of subgenital plate, on slide, 230 – apical part of penis, dorsal view, 231 – male basal abdominal apodemes of sternite 3, on slide, 232 – apical part of subgenital plate, on slide, 233 – caudal part of pygofer, on slide, 234 – paramere, on slide.

(*S.*) *yingfengica* differ from *E.* (*S.*) *mamata* by dorsal lobe of pygofer (Figs 229, 233) smaller, caudal part of paramere (Fig. 234) thicker and penis stem arcuate at the bend, its dorsal processes and dorsal branches of ventral processes more straight and ventral branch of ventral process shorter (Figs 224, 225, 230).

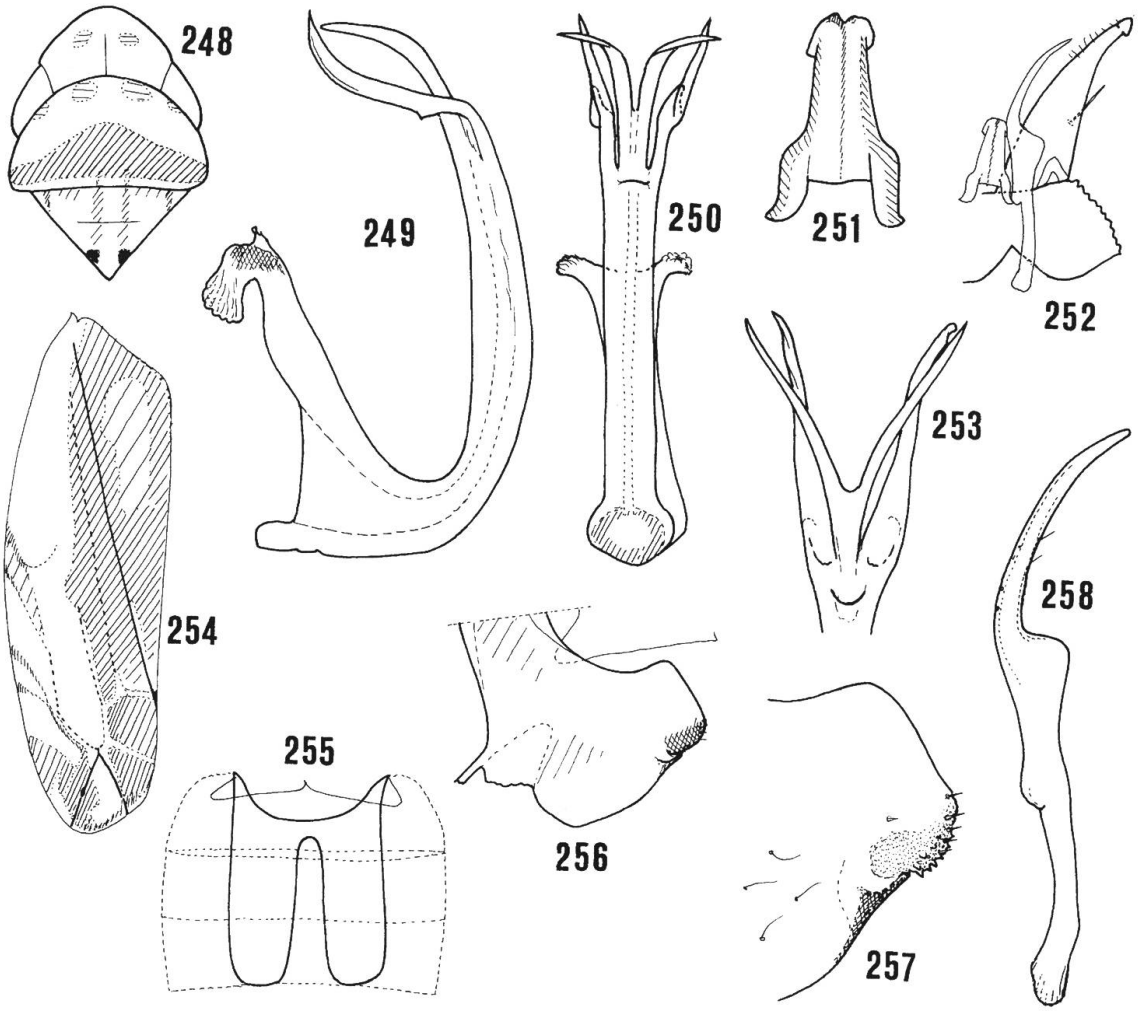


Figs 235–247. *Eurhadina* (*Singhardina*) *acapitata*: 235–237, 235 – head and thorax of male, dorsal view [combination of the original Fig. 689 in DWORAKOWSKA (1982) and head as it is depicted in original Fig. 12.1 in CHIANG et al. (1989)], 237 – penis, side view; *E.* (*S.*) *pallida* sp.nov.: 238–247, 238 – caudal part of pygofer, on slide, 239 – proportions of sternite 9, connective, paramere and subgenital plate, on slide, 241 – apical part of penis, dorsal view, 243 – penis, posterior view, 244 – penis, side view, 245 – paramere, on slide, 246 – male basal abdominal apodemes of sternite 3, on slide, 247 – proportions and pigmentation of pygofer and basal segment of anal tube, on slide.

Eurhadina (*Singhardina*) *acapitata* DWORAKOWSKA, 1982
(Figs 235–237)

DWORAKOWSKA 1982: 159.

Records published. Taiwan, Hassenzan (DWORAKOWSKA 1982: 159); Taiwan, Taichung, Kukuan (CHIANG et al. 1989: 123).



Figs 248–258. *Eurhadina* (*Singhardina*) *prima* sp.nov.: 249 – penis, side view, 250 – penis, posterior view, 251 – connective, on slide, 252 – proportions of sternite 9, connective, paramere and subgenital plate, on slide, 253 – apical part of penis, dorsal view, 255 – male basal abdominal apodemes of sternite 3, on slide, 256 – proportions and pigmentation of pygofer and basal segment of anal tube, on slide, 257 – caudal part of pygofer, on slide, 258 – paramere, on slide.

Eurhadina (*Singhardina*) *pallida* sp.nov.

(Figs 13, 238–247)

Material examined. Holotype ♂: Thailand, Chiengmai Prov., Doi Ang Kong, 1400 m, 1. IV. 1979, Aroon Samruadkit leg. (DOA).

Description. Head and thorax white with citrine yellow patches and brownish to blackish-brown ones as in Fig. 240. Fore wing white with contrasting brown pattern and dark brown patches as in Fig. 242.

Length ♂: 3.60 mm.

Differential diagnosis. Male genitalia resemble *E.* (*S.*) *acapitata* by exceptionally large ventral branch of ventral penis appendage (Figs 241, 243, 244). However, *E.* (*S.*) *pallida* differs from the previous species by penis stem broader and its dorsal margin adorned

with serration, dorsal penis appendage smaller, ventral branch of ventral appendage thicker and dorsal branch of ventral appendage longer.

***Eurhadina* (*Singhardina*) *prima* sp.nov.**
(Figs 248–258)

Material examined. Holotype ♂: Thailand, Chaiyaphum Prov., Pookiew, January 1980, Aroon Samruadkit leg. (DOA). Paratypes: 5 ♂♂, same data as the holotype. (DOA); 1 ♂: Thailand, Fang, 19°55'N, 99°12' E, at light, 25. V. 1991, V. Kubáň leg. (MM).

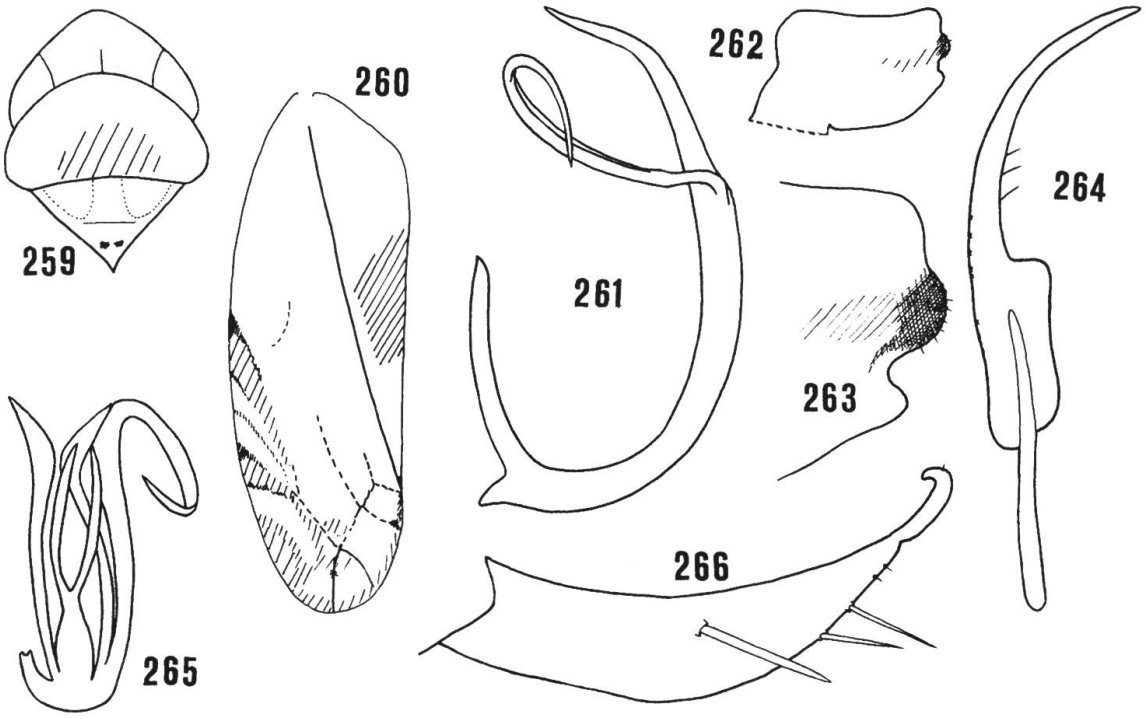
Description. Head and thorax white with orange patches on vertex and anterior margin of pronotum; broad brown fascia on pronotum posteriorly and other brownish infuscations as in Fig. 248. Fore wing white with light brown pattern and blackish markings as in Fig. 254.

Length ♂: 3.30–3.50 mm.

Differential diagnosis. Male genital apparatus resembles *E.* (*S.*) *mamata* but differs by dorsal lobe of pygofer (Figs 256, 257) considerably bigger, caudal part of paramere (Fig. 258) thicker, dorsal branch of ventral penis appendage solid and its ventral branch reduced (Figs 249, 250, 253). Basal abdominal apodemes of male reaching end of segment 5 (Fig. 255).

The *Eurhadina* (*Singhardina*) *robusta* species group:
dina sp.nov., *hema* sp.nov., *krispinilla* sp.nov., *mala* sp.nov., *pookiewica* sp.nov., *rika* sp.nov., *robusta*, *rona* sp.nov. and *sikkimensis*.

Diagnosis. Colouration sordid whitish. Vertex seems to be most often unicoloured. Pronotum without coloured pattern along anterior margin, with infuscation centrally and posteriorly, in some cases including yellow or orange. Scutum and scutellum with various infuscations and yellow or ochre areas. Always two lateral blackish marks on scutellum, often tending to expand horizontally mesad. Fore wing with a pattern of various shades of brown to yellowish-brown, including diagonal streaks at costal margin, apical cells and areas of clavus or whole clavus and adjacent parts of corium. In following illustrations yellow, orange or ochre denoted by horizontal stripes, shades of brown by diagonal stripes and blackish areas as such. Male genitalia resemble *E.* (*S.*) *mamata* group but subgenital plate narrowly terminated, with specialized setosity involving two long microsetae (Figs 266, 286, 299, 317, 331, 339 and 343). Pygofer short and broad, with dorso-caudal region angulate and often drawn cephalad thus exposing remaining (pigmented, sculptured and bearing rigid microsetae) part of the dorsal lobe; ventral lobe obscured (Figs 273, 275, 296, 307). Paramere (Figs 276, 289) with caudal part subequal to the two remaining ones, in most of species adorned with sculpture of small sharp tubercles on its ventral side. Connective (Figs 270, 274) short. Penis often with narrow stem, dorsal processes single, often arising from the common stalk and ventral processes single or bifurcate (Figs 268, 269, 277). Basal abdominal apodemes of male usually broad (Fig. 278).



Figs 259–266. *Eurhadina* (*Singhardina*) *robusta*, 266, after MAHMOOD (1967), 264 – after MAHMOOD (1967), modified, 261, 262 – based on examination of the holotype by J. P. Kramer, modified: 259 – head and thorax of female, paratype, dorsal view, 260 – left fore wing of female, paratype, on slide, 261 – penis, side view, 262 – supposed shape and pigmentation of pygofer, 263 – the same, enlarged, 264 – paramere, 265 – apical part of penis, dorsal view, 266 – left subgenital plate, side view.

Remark. Majority of the species described here came from light traps, therefore it is not unlikely that they lost yellow or orange colouration through exposure to solvents.

Eurhadina (*Singhardina*) *robusta* (MAHMOOD, 1967)
(Figs 259–264)

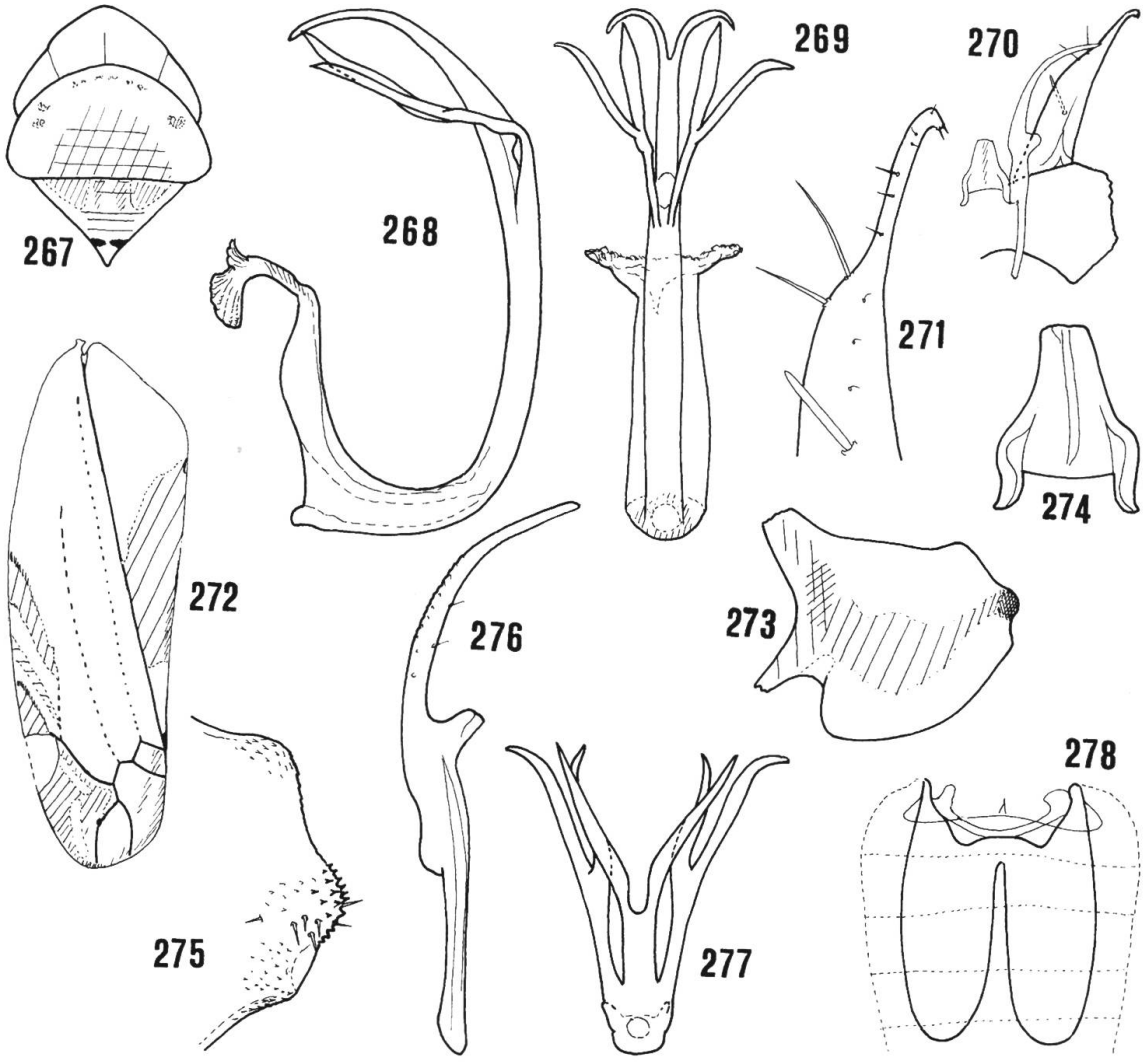
MAHMOOD 1967: 32.

Record published. Singapore (MAHMOOD 1967: 32).

Remarks. The illustrations of male genitalia presented here are those published by me earlier (DWORAKOWSKA 1969: Figs 12 and 20) further modified to catch up with the progress in knowing the group; they can be treated only as the best guess because I did not receive on loan of the holotype of this species for examination.

Eurhadina (*Singhardina*) *rona* sp.nov.
(Figs 267–278)

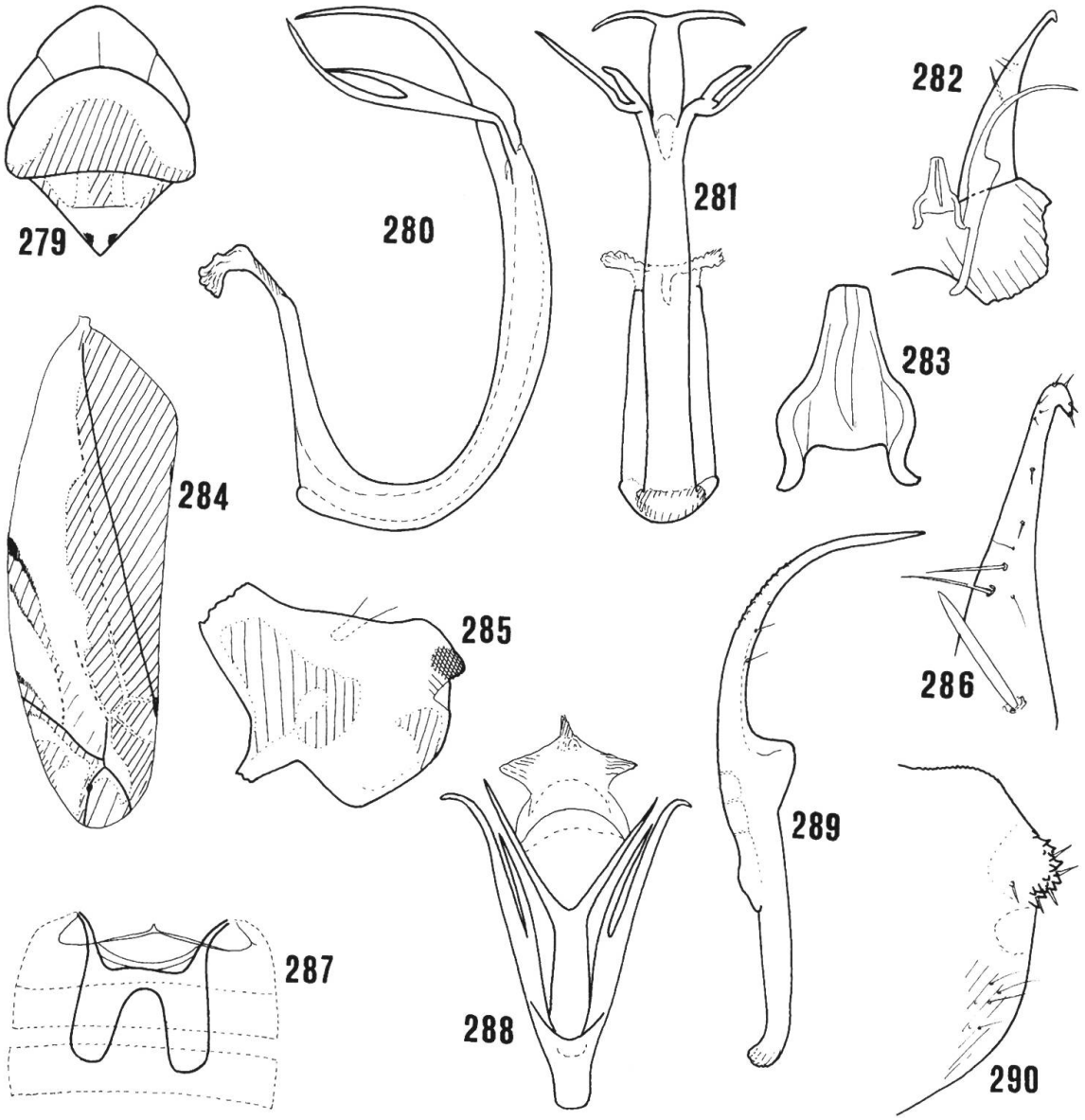
Material examined. Holotype ♂: N Borneo, Malaysia, Sarawak, 16 km N of Bario, Long Rapun Sg. Dapur, 1200 m, 3°53' N, 115°35' E, ML, 19–20. II. 1987, J. Huisman leg. (NMNHL). Paratypes: 2 ♂♂, same data as the holotype; 2 ♂♂: Malaysia, Sabah, Long Pa Sia, airstrip along S Pa Sia, 1090 m, 4°25' N, 115°43'E, at light, J. Huisman et al leg. (NMNHL).



Figs 267–278. *Eurhadina* (*Singhardina*) *rona* sp.nov.: 268 – penis, side view, 269 – penis, posterior view, 270 – proportions of sternite 9, connective, paramere and subgenital plate (misplaced), on slide, 271 – apical half of subgenital plate, on slide, 273 – shape and pigmentation of pygofer, on slide, 274 – connective, on slide, 275 – caudal part of pygofer, on slide, 276 – paramere, on slide, 277 – apical part of penis, dorsal view, 278 – male basal abdominal apodemes of sternite 3, on slide.

Description. Centre and hind part of pronotum yellowish-brown, with olivaceous tint; tan infuscation parallel to its anterior margin (Fig. 267). Basal triangles and centre of scutum brownish; centre of scutellum cephalad of the two horizontal blackish marks yellow-olivaceous. Fore wing with a pattern of various shades of brown and blackish as in Fig. 272. The pattern on clavus and infuscation inside 1st and 2nd apical cells brown-greyish with olivaceous tint. In two out of 5 specimens a diagonal orange streak in costal region (Fig. 272); in one specimen centre of pronotum light brown, basal triangles tan and centre of scutum and scutellum ochre-yellow; in other specimen centre and hind part of pronotum, basal triangles and centres of scutum and scutellum dark brown.

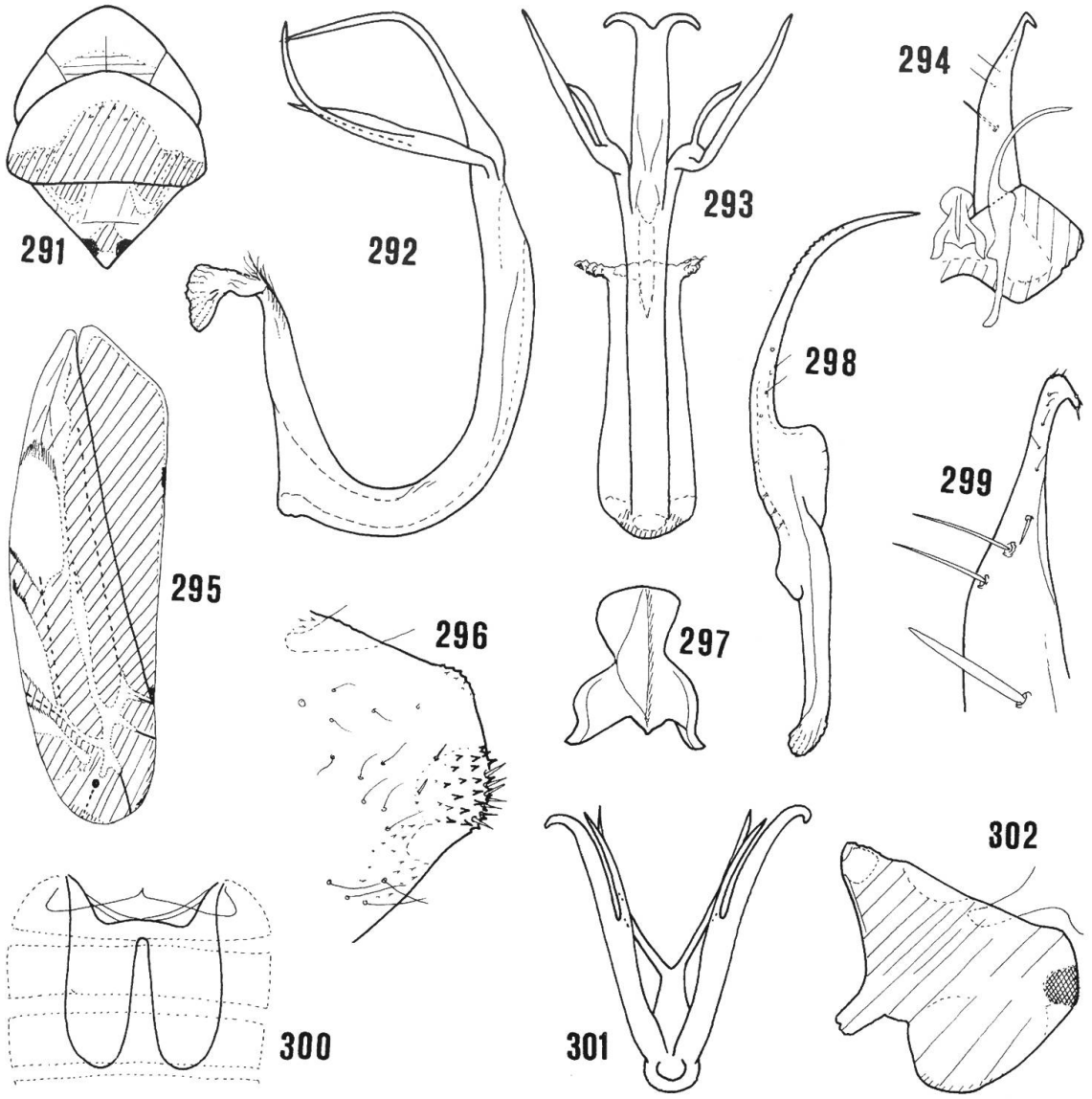
Length ♂: 3.60–3.85 mm.



Figs 279–290. *Eurhadina* (*Singhardina*) *mala* sp.nov.: 280 – penis, side view, 281 – penis – posterior view, 282 – proportions and pigmentation of sternite 9, connective, paramere and subgenital plate (slightly misplaced), on slide, 283 – connective, on slide, 285 – shape and pigmentation of pygofer and base of anal tube, on slide, 286 – apical part of subgenital plate, on slide, 287 – male basal abdominal apodemes of sternite 3, on slide, 288 – penis, dorsal view, basal section with single apodeme above, 289 – paramere, on slide, 290 – caudal part of pygofer, on slide.

Differential diagnosis. The new species resembles *E.* (*S.*) *robusta* the most, both in external characters and in male genitalia. Externally it differs by the patch on clavus longer and infuscation in 4th apical cell darker. Male genitalia differ by pigmented part of dorsal lobe of pygofer smaller (Figs 273, 275), dorsal penis processes longer and ventral branch of ventral penis processes almost straight (Figs 268, 269, 277).

This species name as well as the subsequent names: *mala*, *dina*, *hema* and *rika* spp.nov. are honouring the five youngest daughters of Mr. Japorma Manyhoro from the village Kawar on Sumatra.



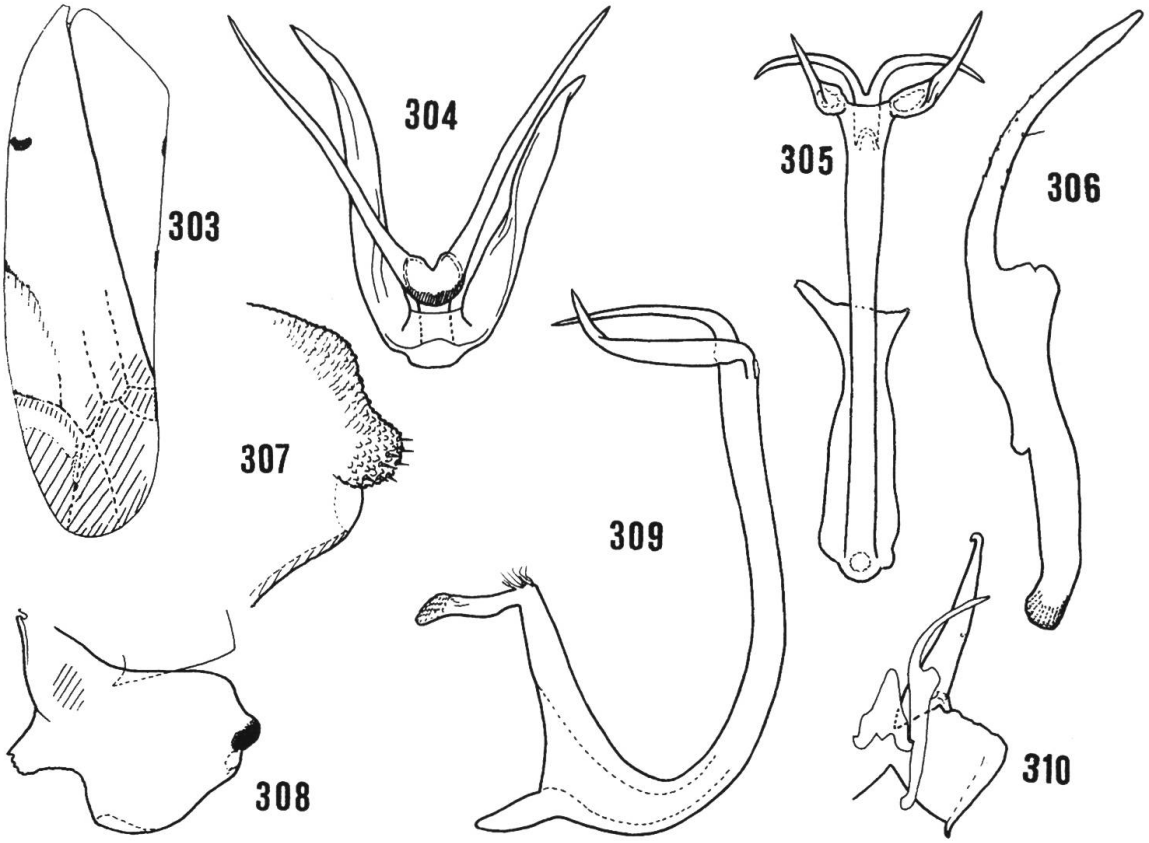
Figs 291–302. *Eurhadina* (*Singhardina*) *dina* sp.nov.: 292 – penis, side view, 293 – penis, posterior view, 294 – proportions and pigmentation of sternite 9, connective, paramere and subgenital plate (misplaced), on slide, 296 – caudal part of pygofer, on slide, 297 – connective, on slide, 298 paramere, on slide, 299 – apical half of subgenital plate, on slide, 300 – male basal abdominal apodemes of sternite 3, on slide, 301 – apical part of penis, dorsal view, 302 – shape and pigmentation of pygofer and base of anal tube, on slide.

Eurhadina (*Singhardina*) *mala* sp.nov.

(Figs 279–290)

Material examined. Holotype ♂: N Borneo, Malaysia, Sabah, Long Pa Sia, confl. S Maga and S Pa Sia, 1350 m, 4°26' 30" N, 115°40' E, moist forest on sandsoil, at light, 16–19. X. 1986, J. Huisman leg. (NMNHL).

Description. Dorsal side of body whitish-grey; vertex with traces of orange basally; pronotum and scutum with sordid brown pattern, basal triangles light; the patch on pronotum (Fig. 279) with blackish specks. Fore wing predominantly brown on commissural half, light brown on costal half (Fig. 284).



Figs 303–310. *Eurhadina* (*Singhardina*) *krispinilla* sp.nov.: 304 – penis, dorsal view, 305 – penis, posterior view, 306 – paramere, on slide, 307 – caudal part of pygofer, on slide, 308 – proportions and pigmentation of pygofer and basal segment of anal tube, on slide, 309 – penis, side view, 310 – proportions of sternite 9, connective, paramere and subgenital plate, on slide.

Length ♂: 3.65 mm.

Differential diagnosis. Colouration similar to *E.* (*S.*) *mamata* but male genitalia resemble *E.* (*S.*) *rona*. The following characters allow to distinguish this new species from the previous one: dorsal lobe of pygofer narrower (Figs 285, 290), caudal part of paramere slimmer (Fig. 289), penis stem broad, its dorsal process horizontal in profile (Fig. 280) (in the former species arcuate) and in posterior view (Fig. 281), common base of the processes quite broad (Fig. 288); ventral penis process bifurcate further from the bend; the branches run parallel to one another (in the previous species they diverge) and the dorsal branch distinctly shorter.

Eurhadina (*Singhardina*) *dina* sp.nov.

(Figs 291–302)

Material examined. Holotype ♂: N Borneo, Malaysia, Sabah, Long Pa Sia airstrip along S Pa Sia, 1090 m, 4°25' N, 115°43' E, at light, 14. X. 1986, J. Huisman leg. (NMNHL). Paratypes: 2 ♂♂, same data as the

holotype; 4 ♂♂: Long Pa Sia, banks of S Pa Sia, 1090 m, 4°25' N, 115°43'E, secondary vegetation, 14–28. X. 1986, J. Huisman leg.; 3 ♂♂: Sabah, Kg. Long Pa Sia airstrip 1000 m, 4°24' N, 115°43' E, ML light, IV. 1987, J. Huisman leg.; 10 ♂♂: Long Pa Sia, confl. S Maga and S Pa Sia, 1350 m, 4°26' 30" N, 115°40' E, moist forest on sandsoil, at light, 16–19. X. 1986, A. Huisman leg.; 3 ♂♂: S Sabah, Beaufort, 105 km S of Long Pa Sia area confluence Sg. Pa Sia – Maga, along S Maga, 1210 m, 4°26' N, 115°40' E, natural tropical forest, at light, 2. IV. 1987, J. van Tol & J. Huisman leg.; 1 ♂, same area, confluence Sg. Pa Sia – Matang, 1000 m, 4°24' N, 115°43'E, semicultivated area, at light, 5. IV. 1987, J. van Tol & J. Huisman leg.; 2 ♂♂, Sarawak, 16 km N of Bario, Long Rapun, Sg. Dapur, 1200 m, 3°53' N, 115°35' E, ML, 19–20. II. 1987, J. Huisman leg. (NMNHL).

Description. Vertex sordid whitish with broad ochre-yellow fascia basally (Fig. 291), absent from some specimens. Pronotum with large brown-olivaceous area suffused with blackish specks. Scutum and scutellum with sordid brownish infuscations. Fore wing mostly sordid brown, beige at costal margin basally, yellowish-brown in costal half posteriorly; areas light in Fig. 295 whitish, darker markings dark brown.

Length ♂: 3.70–4.15 mm.

Differential diagnosis. This species is closely related to *E.* (*S.*) *mala* and differs by darker colouration and by male genitalia. Pygofer with dorsal lobe well consolidated with the ventral one (Figs 296, 302). Dorsal penis process (in side view) bend (Fig. 292) and ventral branch of ventral penis process much thicker (Figs 293, 301).

Eurhadina (*Singhardina*) *sikkimensis* Dworakowska, 1994

Dworakowska 1994: 139.

Record published. India, Sikkim, Pelling, 1800 m, on *Castanopsis* (Dworakowska 1994: 139).

Eurhadina (*Singhardina*) *krispinilla* sp.nov.

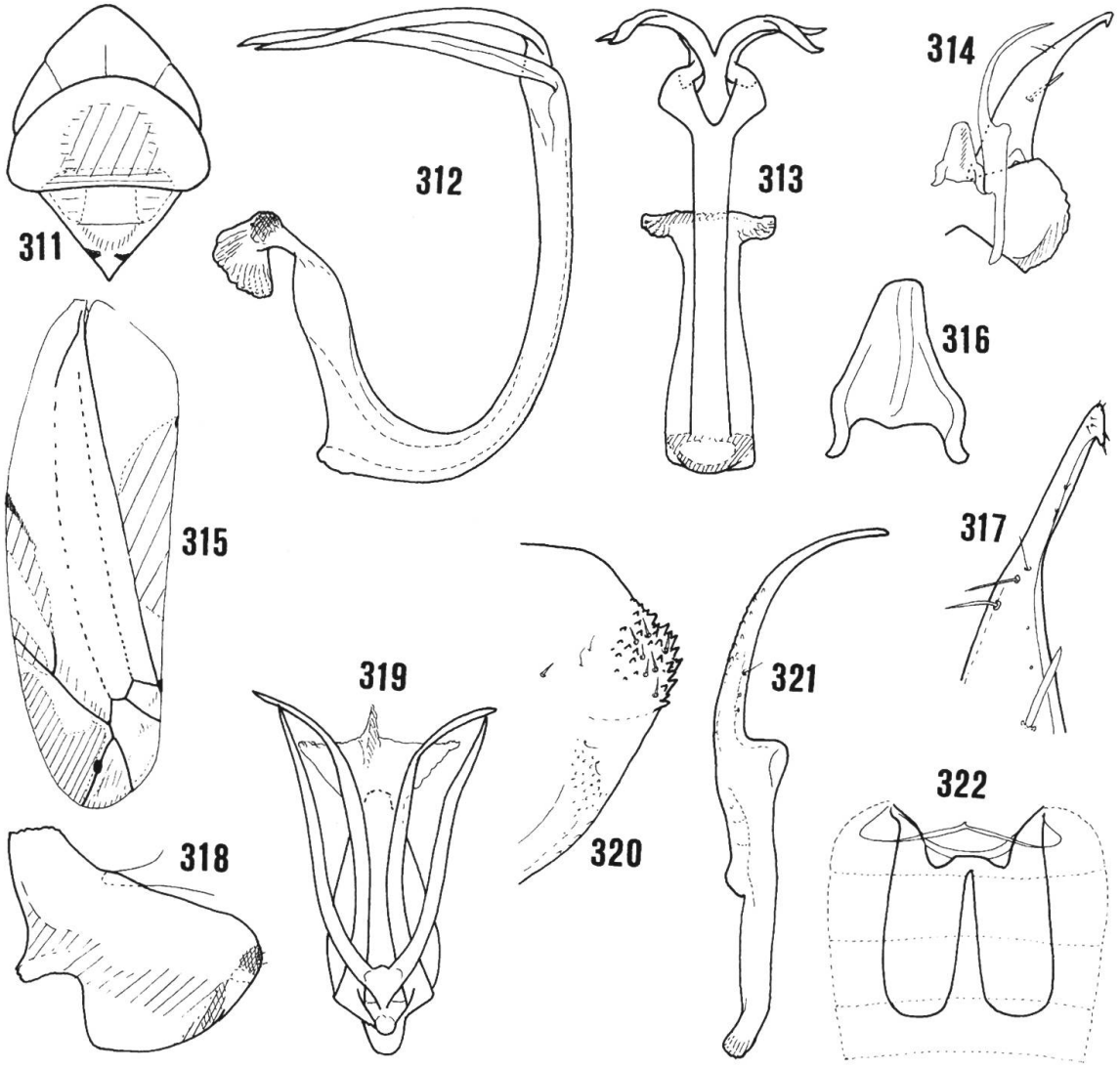
(Figs 303–310)

Material examined. Holotype ♂: Thailand, "Fang" [territory], Chiengmai, lot 4117, 8. XI. 1988, A. Lewvanich leg. (DOA).

Description. Dorsal side sordid whitish. Vertex light beige with two transverse orange fasciae basally. Fore wing (Fig. 303) sordid white with infuscations.

Length ♂: 3.80 mm.

Differential diagnosis. This species is closely related to *E.* (*S.*) *sikkimensis* showing same colouration (orange marks on vertex, large blackish patches on scutellum) and similarity in male genitalia. Penis stem narrow, both penis appendages unbranched. The difference between the two species is in lighter colouration of fore wing in *E.* (*S.*) *krispinilla* (Fig. 303), in similar length of penis appendages (Figs 305, 309) (in the previous species dorsal appendages are much smaller) and in U-shape of the ventral ones in dorsal view (Fig. 304) (in *E.* (*S.*) *sikkimensis* the appendages are sinuate and lyraeform).

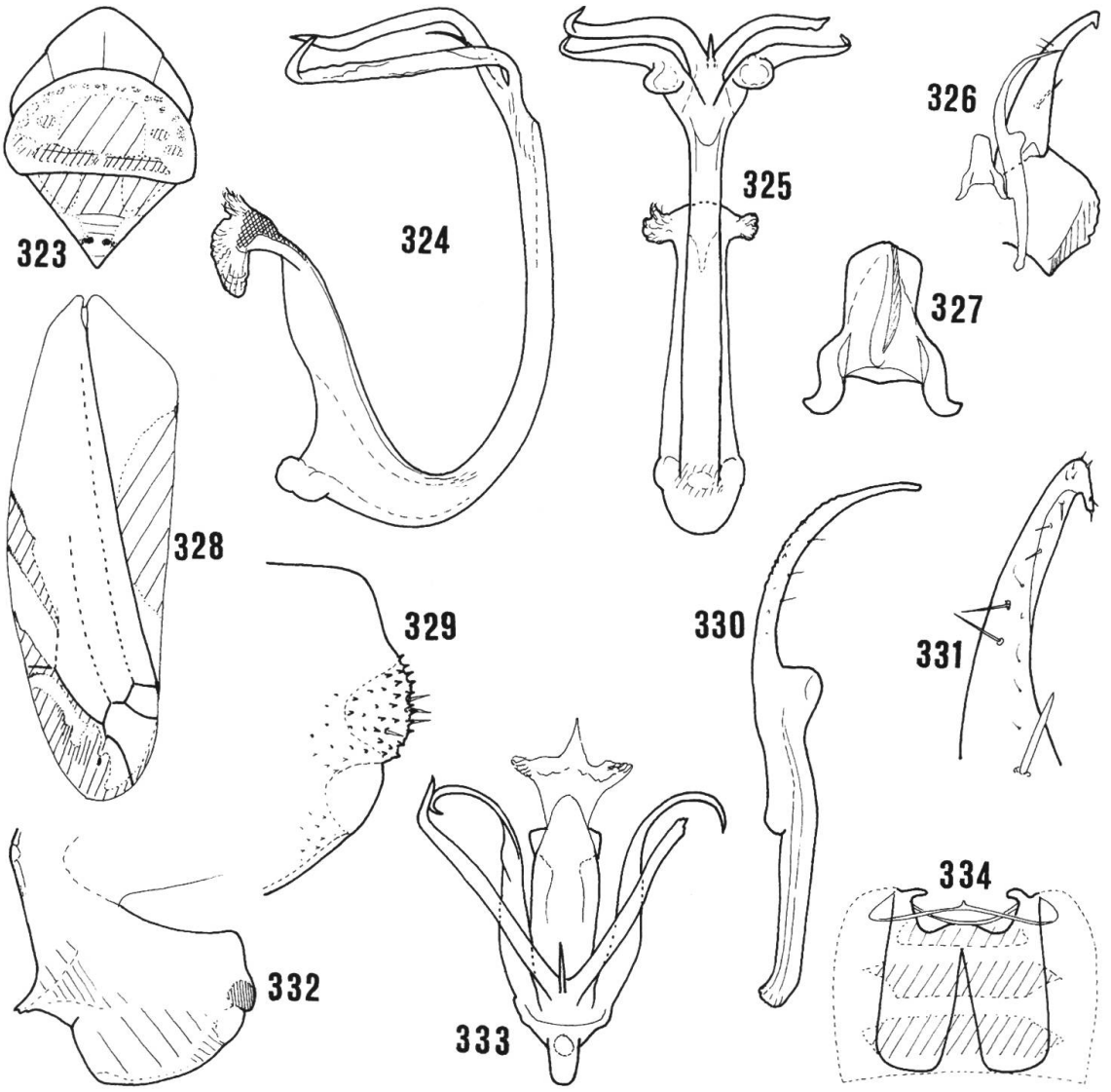


Figs 311–322. Eurhadina (*Singhardina*) *hema* sp.nov.: 312 – penis, side view, 313 – penis, posterior view, 314 – proportions and pigmentation of sternite 9, connective, paramere and subgenital plate, on slide, 316 – connective, on slide, 317 – apical 3/5 of subgenital plate, on slide, 318 – shape and pigmentation of pygofer and base of anal tube, on slide, 319 – penis, dorsal view, basal section above, 320 – caudal part of pygofer, on slide, 321 – paramere, on slide, 322 – male basal abdominal apodemes of sternite 3, on slide.

Eurhadina (*Singhardina*) *hema* sp.nov.
(Figs 3, 311–322)

Material examined. Holotype ♂: N Borneo, Malaysia, Sarawak, 16 km N of Bario, Long Rapun Sg. Dapur, 1200 m, 3°53' N, 115°35' E, ML, 19–20. III. 1987, J. Huisman leg. (NMNHL).

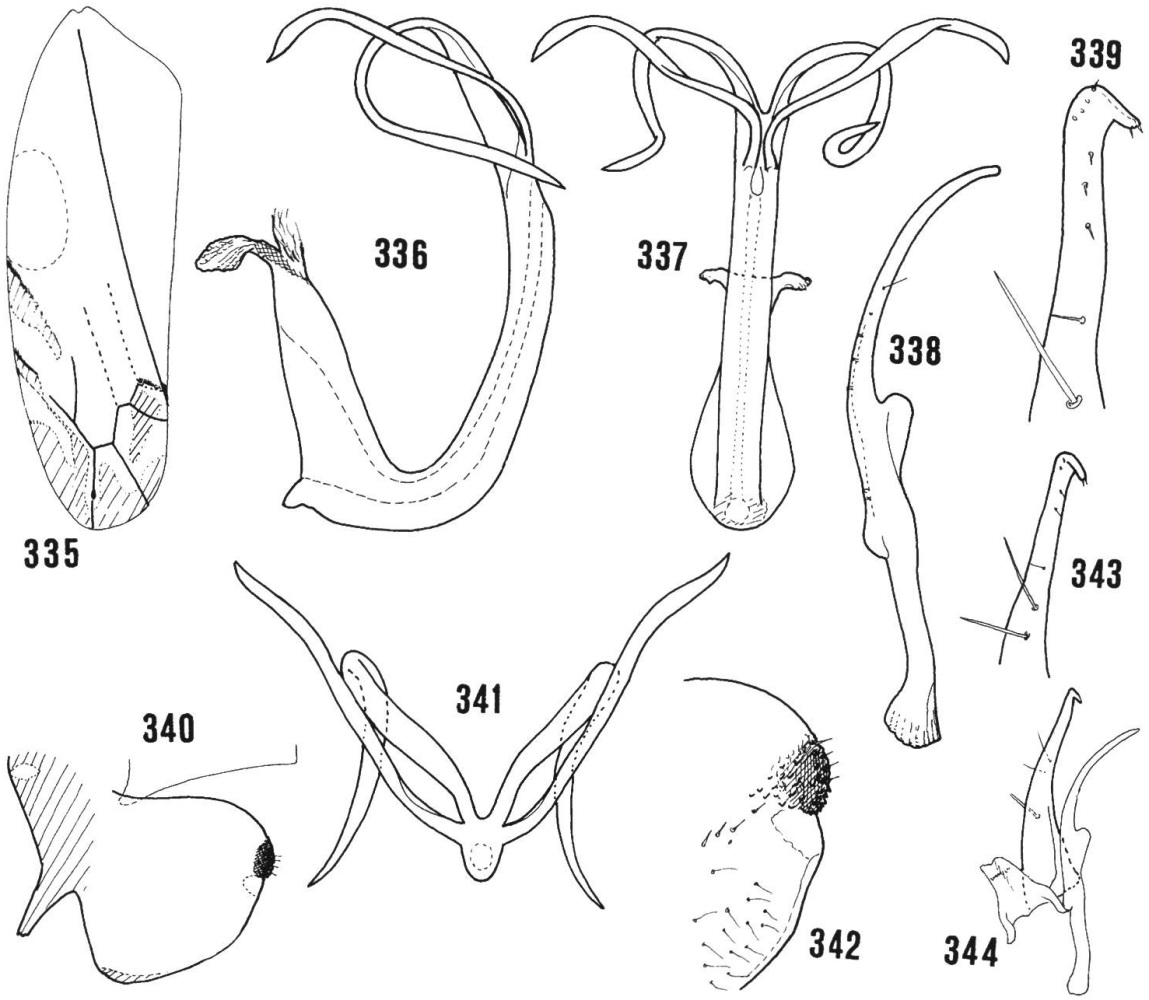
Description. Vertex produced in the middle. Dorsal side sordid whitish. Centre of pronotum greyish-tan, its hind margin slightly ochre-brownish centrally. Yellowish tint on basal triangles and in centre of scutum; other infuscations as in Fig. 311. Fore wing whitish with brownish-grey patch on clavus and brown pattern in 4th apical cell and at costal margin (Fig. 315).



Figs 323–334. *Eurhadina* (*Singhardina*) *rika* sp.nov.: 324 – penis, side view, 325 – penis, posterior view, 326 – proportions and pigmentation of sternite 9, connective, paramere and subgenital plate, on slide, 327 – connective, on slide, 329 – caudal part of pygofer, on slide, 330 – paramere, on slide, 331 – apical 2/3 of subgenital plate, on slide, 332 – shape and pigmentation of pygofer (indicated outline of base of anal tube), on slide, 333 – penis, dorsal view, basal section above, 334 – male basal abdominal apodemes of sternite 3 (pigmentation of tergites marked with diagonal lines), on slide.

Length ♂: 3.90 mm.

Differential diagnosis. This species is externally similar to *E.* (*S.*) *robusta* because of the patch on clavus and blackish markings on scutellum expanding mesad but male genitalia indicate relation to *E.* (*S.*) *sikkimensis* because of narrow penis stem and unbranched penis appendages. However, the present species differs from the former by dorsal lobe of pygofer very short and narrow (Figs 318, 320), caudal part of subgenital plate very narrow (Figs 314, 317) and both penis appendages equally long (Figs 312, 313) and both curved in lyrae shape in dorsal view (Fig. 319).



Figs 335–344. *Eurhadina* (*Singhardina*) *pookiewica* sp.nov.: 336 – penis, side view, 337 – penis, posterior view, 338 – paramere, on slide, 339 – apical 1/4 of subgenital plate, on slide, 340 – proportions and pigmentation of pygofer and basal segment of anal tube, on slide, 341 – apical part of penis, dorsal view, 342 – caudal part of pygofer, on slide, 343 – caudal 1/3 of subgenital plate, on slide, 344 – proportions of connective, paramere and subgenital plate (misplaced), on slide.

Eurhadina (*Singhardina*) *rika* sp.nov.

(Figs 323–334)

Material examined. Holotype ♂: N Borneo, Malaysia, Sabah, Beaufort, 105 km S of Long Pa Sia area, confluence Sg. Pa Sia – Matang, 1000 m, 4°24' N, 115°43' E, semicultivated area, at light, 5. IV. 1987, J. van Tol & J. Huisman leg. (NMNHL).

Description. Head, pronotum and scutum sordid whitish, with tan, sordid brownish, brown (fascia on pronotum) and ochre-yellow (centre of scutellum) colouration (Fig. 323). Fore wing white with brown and blackish markings; on clavus light tan patch (Fig. 328) with olivaceous tint.

Length ♂: 4.00 mm.

Differential diagnosis. The present species resembles E. (S.) hema the most differing from it in seemingly darker colouration of dorsal side of thorax and by male genitalia.

The differences includes dorsal lobe of pygofer very broad (Figs 329, 332); caudal tapering part of subgenital plate broader (Figs 326, 331); dorsal penis appendages forming V in dorsal view (Fig. 333); the ventral appendages longer, thinner and strongly curved laterad (Figs 324, 333) and the presence of single minute mesal process at the bases of the dorsal appendages.

***Eurhadina* (*Singhardina*) *pookiewica* sp.nov.**
(Figs 335–344)

Material examined. Holotype ♂: Thailand, Chaiyaphum Prov., Pookiew, January 1980, Aroon Samruadkit leg. (DOA).

Description. Whitish, with brownish pattern restricted to apical 2/5 of corium (Fig. 335).

Length ♂: 3.60 mm.

Differential diagnosis. This species shows subgenital plate (Figs 339, 343, 344) and pygofer (Figs 340, 342) characters of *E.* (*S.*) *robusta* species group. It differs, however, from all other known species by its light colouration and penis with quite broad stem and long unbranched apical processes shaped in arches and loops (Figs 336, 337, 341).

The *Eurhadina* (*Singhardina*) *lactea* species group:
lactea sp.nov.

Diagnosis. Colouration similar to *Eurhadina* s.str. Male genitalia showing characters of various groups within *Singhardina* but remaining at the same time unique. Pygofer (Figs 351, 352) consolidated to a highest degree within the genus *Eurhadina*, with single lobe caudally. Subgenital plate of the proportions as in *E.* (*S.*) *punjabensis* species group tapering caudad (Fig. 349), similar to *E.* (*S.*) *uszata* but the two bigger setae (Fig. 354) resemble setosity in *E.* (*S.*) *robusta* species group. Paramere (Figs 348, 349) as in *E.* (*S.*) *chiengdaoa*, but no setae. Connective with long manubrium as in *E.* (*S.*) *punjabensis* and *E.* (*S.*) *vittata* species groups but its arms lobate. Penis resembling *E.* (*S.*) *punjabensis* species group but is unique in proportions of processes.

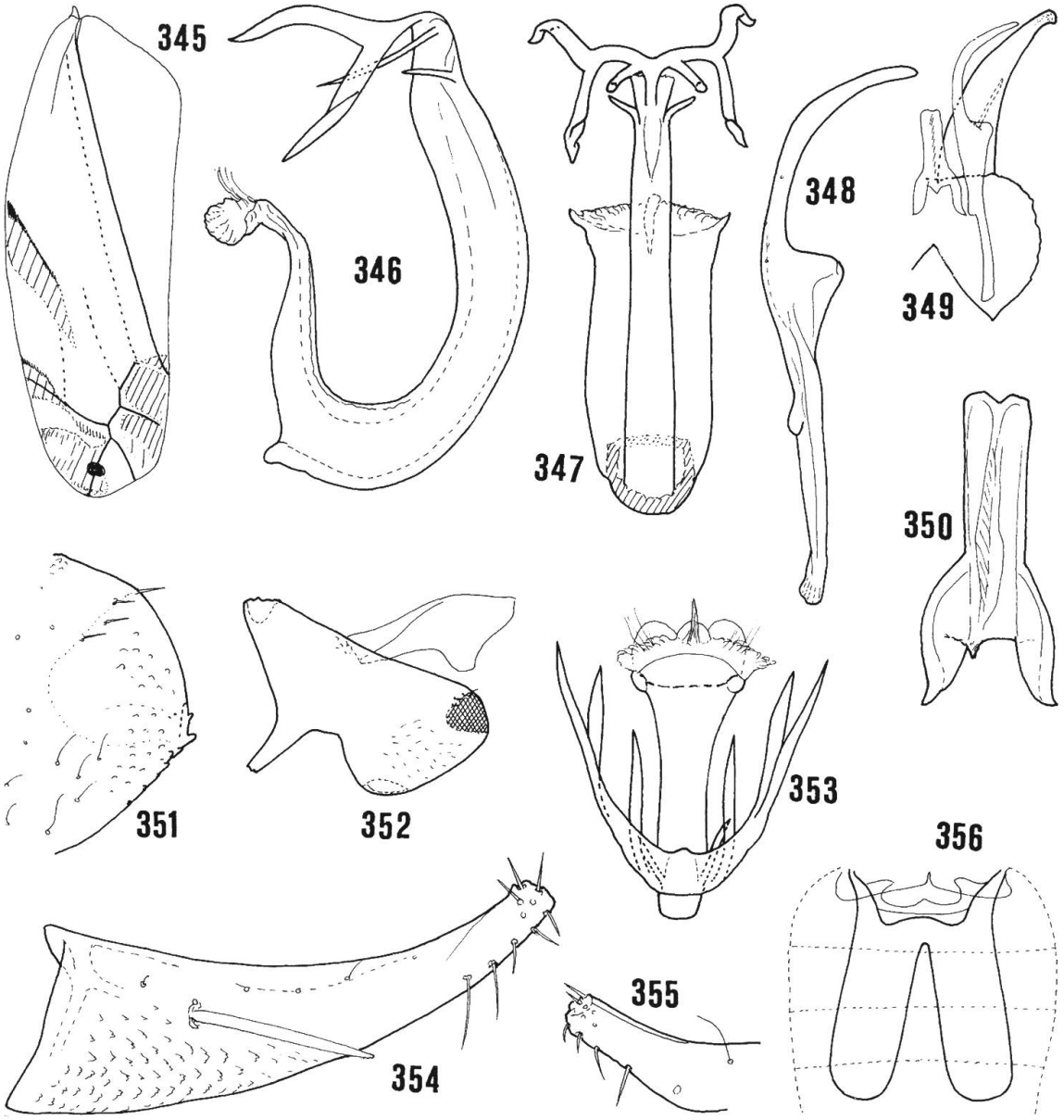
***Eurhadina* (*Singhardina*) *lactea* sp.nov.**
(Figs 345–356)

Material examined. Holotype ♂: N Borneo, Brunei, Ulu Temburong, 300 m, II–III. 1982, M.C. Day leg. (BMNH).

Description. Head and dorsal side of thorax white, without markings. Fore wing white with light brown pattern as in Fig. 345.

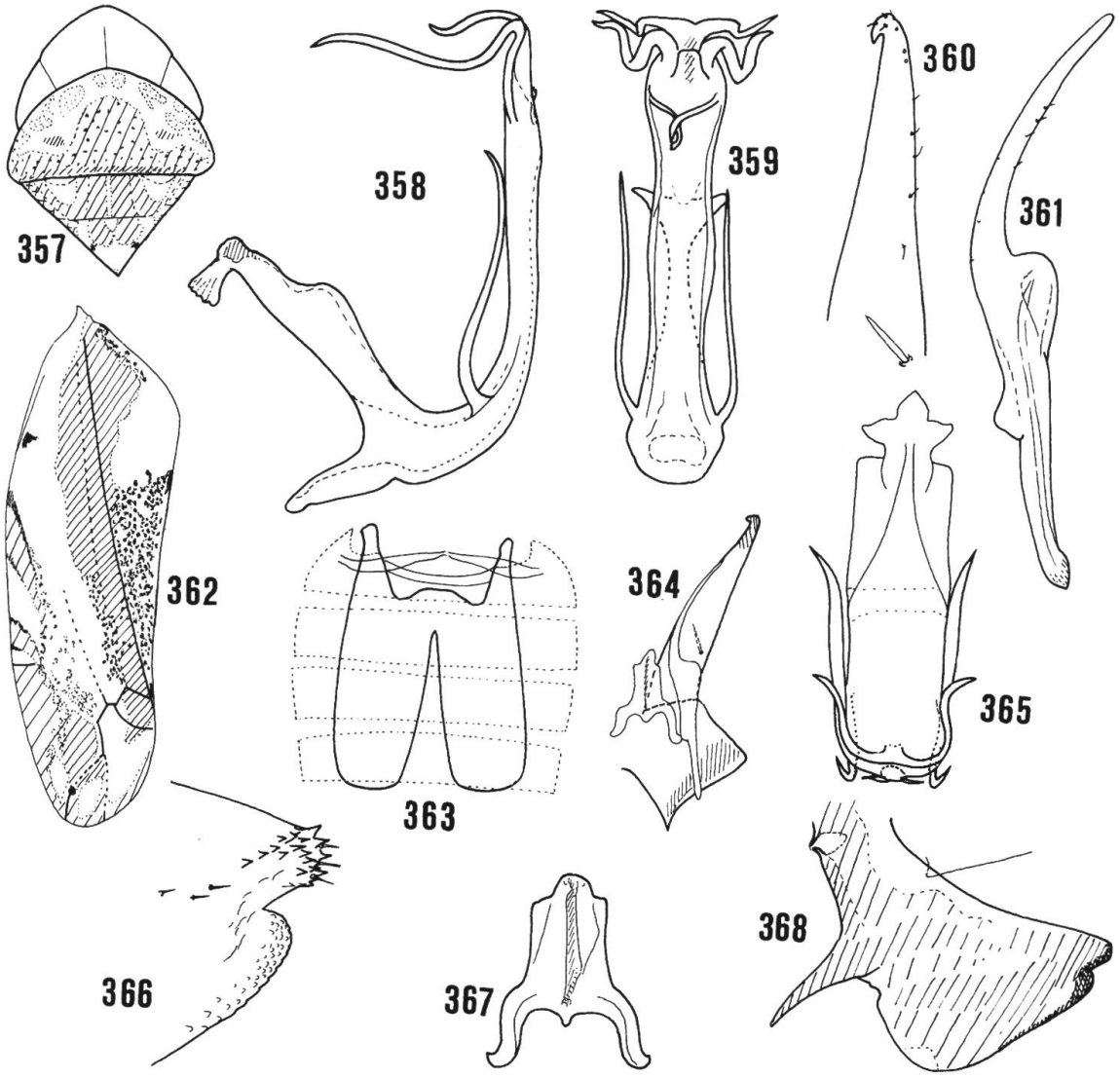
Length ♂ 2.80 mm.

Differential diagnosis. This species externally resembles *E.* (*S.*) *chiengdaoa* but details of colouration slightly different and male genitalia unique. Pygofer with rich sculpture and pigmentation belonging to the ventral lobe which is fully fused with the dorsal lobe



Figs 345–356. *Eurhadina* (*Singhardina*) *lactea* sp.nov.: 346 – penis, side view, 347 – penis, posterior view, 348 – paramere, on slide, 349 – proportions and pigmentation of sternite 9, connective, paramere and subgenital plate, on slide, 350 – connective, on slide, 351 – caudal part of pygofer, on slide, 352 – proportions and pigmentation of pygofer and basal segment of anal tube, on slide, 353 – penis, dorsal view, basal section above, 354 – left subgenital plate, side view, 355 – apical part of right subgenital plate, side view, 356 – male basal abdominal apodemes of sternite 3, on slide.

on its part reduced to a narrow wedge (above the pigmented area in Fig. 352) and detectable as such only owing to the position of small rigid microsetae (Fig. 351). In penis structure characteristic is broad stem and ventral apical appendages very short (Figs 346, 347).



Figs 357–368. *Eurhadina* (*Singhardina*) *kirkaldyi* sp.nov.: 358 – penis, side view, 359 – penis, posterior view, 360 – apical 3/4 of subgenital plate, on slide, 361 – paramere, on slide, 363 – male basal abdominal apodemes of sternite 3, on slide, 364 – proportions and pigmentation of sternite 9, connective, paramere and subgenital plate (slightly misplaced), on slide, 365 – penis, dorsal view, basal section above, 366 – caudal part of pygofer, on slide, 367 – connective, on slide, 368 – pygofer and outline of base of anal tube (pigmentation denoted by diagonal lines, dashes and chequered areas), on slide.

The *Eurhadina* (*Singhardina*) *kirkaldyi* species group: *kirkaldyi* sp.nov.

Description. The colouration, wing venation and male genital apparatus do not fit with any of the distinguished species groups of *Singhardina*.

Colouration consists of areas of various shades of brown with numerous darker specks all over.

Pygofer narrowing caudad with both lobes detectable, sculptured and pigmented but without even traces of sclerotized ledges dorsally (Figs 366, 368). Subgenital plate

tapering, curved and pigmented apically, terminated on a pointed protrusion, its setosity reduced (Fig. 360). Paramere with quite thick straight caudal part (Fig. 361). Connective short (Fig. 367). Penis with unbranched processes (Figs 358, 359, 365) of which only the dorsal ones are typical of the already well known species of *Eurhadina*. The apical ventral penis processes and basal lateral ones deriving from the 1st section and a pair of short caudal processes are unique characters of this species. The caudal processes arising parallel to the apical ventral processes represent rather derivatives of the next scale-section – the 3rd one.

Eurhadina (*Singhardina*) *kirkaldyi* sp.nov.

(Figs 357–368)

Material examined. Holotype ♂: N Borneo, Malaysia, S Sabah, Beaufort, 105 km S of Long Pa Sia area, Sg. Ritan, 1160 m, 4°24'N, 115°42' E, natural tropical forest, at light, 8. IV. 1987, J. van Tol & J. Huisman leg. (NMNHL).

Description. Head and dorsal side of pronotum light beige. Pattern shown in Fig. 357 beige-grey and dark brown, the dark dots blackish-brown, infuscation parallel to the anterior margin of pronotum dark beige. Scutum and scutellum dark or light brown (basal triangles); posterior part of scutellum sordid whitish. Fore wing whitish, with patches of various shade of brown, the mottled infuscation brown, dark markings blackish.

Length ♂: 4.65 mm.

Differential diagnosis. Male genital apparatus unique, with basal penis processes and three pairs of apical penis processes puts this species apart from all others known in the subgenus *Singhardina*. Specifically characteristic, except the pattern of colouration, is penis structure (Figs 358, 359, 365).

Species not assigned to any group

Eurhadina (*Singhardina*) *unilobata* CHIANG, HSU ET KNIGHT, 1989

CHIANG et al. 1989: 125

Record published. Taiwan, Taichung, Tung Ma-dung Mt. (CHIANG, HSU & KNIGHT 1989: 125).

Remarks. Illustrations in the original description are too imprecise and, in part, apparently erroneous that grouping of this species must be left until new material will be available or the holotype revised.

Acknowledgements

Most of the material used in this study comes from Thailand and was offered for my study by Mrs. Waree Hongsaprug and Dr. P. Lauterer and also from N Borneo obtained through the courtesy of Dr. C. van Achterberg. Overview of the subgenus was possible owing to the research award from CIDA that resulted in revising the species described by the Chinese authors.

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