

THE HOLOTYPE OF *HOMONEURA GRANDIS* (KERTÉSZ, 1915)
WITH DESCRIPTION OF A NEW SPECIES
FROM TAIWAN (DIPTERA, LAUXANIIDAE)

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The holotype of *Lauxania (Minettia) grandis* Kertész, 1915, the representative species of an Oriental species group of the huge genus *Homoneura* Wulp, 1891, is redescribed and illustrated. Most of the species in this group – whose characterisation is given in the paper – have not been described. One species of this group, *H. pseudograndis* sp. n. is described here from Taiwan. The importance of male genitalia characters is discussed. With 15 original figures.

Key words: Diptera; Lauxaniidae; *Homoneura grandis*, *H. pseudograndis* sp. n., Taiwan

INTRODUCTION

The genus *Homoneura* Wulp, 1891 has become by far the most species rich genus of the Lauxaniidae (numerous species have been described as *Homoneura* from all biogeographical regions, except from the Neotropics and from New Zealand). MILLER (1977) revised 50 Nearctic species; PAPP and SHATALKIN (1998) mentioned 79 species from the Palaearctic region; SHEWELL (1977) catalogued 261 species from the Oriental region; KIM (1994) described and keyed 92 species from Australia, etc. Rather recently Ms Li Shi (e.g. SHI & YANG 2009) worked on the Oriental and Chinese *Homoneura* species.

A number of subgenera have been described in *Homoneura*, some of them elevated later to generic rank. KIM (1994) recognised ten subgenera. Some of the former subgenera are regarded as genera by some authors, which are mostly well substantiated with strong evidence for their monophyly. In addition, the monophyly of the subgenera in the remaining *Homoneura* has also been cleared one by one, but not including the nominate subgenus. Therefore, the large number of species have been treated in species groups (e.g. SHI & YANG 2009). Ms Li Shi (pers. comm.) also studied specimens of the *H. grandis* group, and of course, a claim on the identity of the holotype of *Homoneura grandis* (Kertész, 1915) has emerged. As a curator of a large collection of Diptera for 36 years, the senior author was not inclined to dissect unique type specimens. However, in this case the only solution was to dissect the holotype and study its genital features. In the course of this short study a new spe-

cies was also found among the specimens with the *H. grandis* holotype in the HNHM Collection.

Homoneura grandis is a member of a species rich monophyletic group of Oriental species, whose distinctness is supported by a number of synapomorphies. Below we list characteristic features, i.e. probable synapomorphies of the group, since without a broad cladistic analysis nobody can state which of them are true synapomorphies.

MATERIALS AND METHODS

The type specimens and other specimens studied in course of this work are preserved in the Diptera Collection of the Hungarian Natural History Museum Budapest (HNHM). Several more specimens of the *H. grandis* group have been studied in that Collection from Thailand, Vietnam and Taiwan.

Abdomina were dissected and prepared in a 10% sodium hydroxide, washed in luke-warm water, neutralised in lactic acid, washed again and put in plastic microvials with glycerol. The protandrium and epandrium with surstyli as well as inner genitalia were detached from the rest of the abdomen with two sharp collection pins (abdomina lying on dorsal side). Inner genitalia were removed, and the phallus, postgonites plus phallopodeme, and hypandrium were separated.

Figures were made in glycerol under a normal 1/1 cover glass put over glycerol on a drop-center microscopic slide. The dissections were positioned under an OLYMPUS SZ-ST stereomicroscope usually under 60 x magnification; figures were made on an OLYMPUS BX40 microscope with an OLYMPUS U-DA drawing tube. After inking, the individual figures were arranged into plates, which were scanned *in toto*, and edited later.

Annotations of label data are in square brackets, handwriting in quotation marks; labels are numbered top to bottom.

TAXONOMY

Homoneura grandis species group

Large bodied lauxaniids: body length 6.0–7.8 mm, wing length 6.0–8.0 mm. Body and legs yellow, wing with characteristic large brown spots.

Prefrons (facial plate) with a pair of shallow depressions below antennae. Postfrons usually with a medial brown ochre or light brown stripe, 2 pairs of strong fronto-orbitals, very long inner and outer verticals, postverticals long and crossing. Ocellar pair long and thick, originating inside or on border of ocellar triangle, and almost reaching lunule. Ocellar triangle concolorous, very small, only about 1/7 of frontal width. A single row of long and thick postocular setae. Gena not broad, only 2/11–1/5 of the height of head. Genal setae not peristomal, since prefrons much broadened below, encompassing c. 3/4 of mouth opening. Some longer postgenal setae present. Clypeus about 1/4 width of head.

Scape small, pedicel ventrally with some setae: the longest one as long as first flagellomere or almost so; also a long dorsal seta present on pedicel. First flagellomere about



Figs 1–6. *Homoneura* species, male genitalia. 1–3 = *H. grandis* (Kertész, 1915), holotype: 1 = surstylus, broadest (sublateral) view, 2 = cercus, lateral view, 3 = surstylus, broadest inner (medial) view (outer setae omitted). 4–6 = *H. pseudograndis* sp. n., holotype: 4 = cercus, lateral view, 5 = surstylus, broadest (sublateral) view, 6 = surstylus, broadest inner (medial) view (outer setae omitted). Scales: 0.4 mm for Figs 2, 4, 0.2 mm for Figs 1, 3, 5–6.

3 times as long as pedicel and about 2 times longer than high with long dense grey cilia, particularly so apically. Arista dorsally with short (0.20–0.25 mm) rays.

Postscutellum weakly developed. Thoracic squama present only as a curved very narrow membrane over the border of meso- and metathorax, alar squama distinct with marginal cilia. 3 pairs of strong postsutural dorsocentral setae, anterior pair just behind suture. Prescutellar acrostichal pair extremely long, as long as or even longer than scutellum. Acrostichal setulae not well-ordered, c. 12 rows between anterior dorsocentrals. Scutellum large, broad, about 3/4 as broad as thorax. Notopleuron bare, i.e. free of microchaetae. Other characteristic setal pairs: 1 postpronotal, 2 notopleurals, 2 strong pairs of supra-alar, 1 posterior intra-alar. No anterior intra-alar seta. Supracoxal seta distinct, as long as antenna. Anepisternum with a strong seta on posterior margin and with numerous setulae on its caudal 3/5–3/4. Katepisternum with 2 strong setae, both are rather caudal, also with numerous setulae like on anepisternum. Katepisternal setulae longer ventrally.

Legs yellow, tarsi ochre or darker (a lighter brown). Fore femur with a ctenidium of 13–14 short sharp setulae. Legs otherwise have no specific features, which would separate them from the other species groups of *Homoneura* s. lato. Wing light yellow or yellowish grey with larger brown spots on apical section of R_{2+3} , R_{4+5} and M_{1+2} , also a proximal spot on R_{4+5} and a larger diffuse though not darker brown around M-M crossvein. Costa with an unbroken row of short thick setae to the apex of R_{4+5} . Discal cell long, R-M crossvein proximal to middle of discal cell. Distal section of vein M_{3+4} very short. Halter comparatively small, knob yellow, at most light brownish.

Abdomen yellow (at most ochre), with whitish or light greyish white tomentum. Marginal setae of preabdominal tergites only medium-long.

Syntergosternite (segment 7+8) forms a closed ring, not fused to epandrium at all, but ventrally weakly sclerotised, so in stronger hydroxide treatment it may be largely dissolved i.e. without a ventral pair of cranially directed sclerotised processes.

Epandrium bulging, ventrally "open" with rather small ventral cerci. Subepandrial sclerite weakly sclerotised, present as medially fused oblique plates. Surstylus long, apex blunt, surstylus extended basally, long setae on its outer surface only. Inner (medial) surface of surstylus with thick short peg-like processes (they do not seem to be setae). Lateral wall of surstylus partly fused with epandrium with strong border, inner wall lengthened into a flat plate inside epandrium. The whole inner genitalia are asymmetrical. Hypandrium transverse with 1 pair of ventral processes, which may be divided or bear smaller processes (Figs 7–10). Hypandrial apodeme usually short. Postgonite (gonopod) (Figs 13–14) composed of 3 processes: medial process directly connected to phallapodeme (Fig. 13), lateral (double) process connected to phallapodeme through membranes only. Phallus simple and well sclerotised, usually subcylindrical (Figs 11–12). Phallapodeme closer to postgonites than to phallus and *not* fused to phallus (in contrast to the type species of *Homoneura*). Ejaculatory apodeme was not observed.

Female terminalia simple, cercus comparatively long. Sternite 8 with long sharp lateral processes.

Homoneura grandis (Kertész, 1915)
(Figs 1–3, 7–8, 11, 13–14, 16–18)

Lauxania (*Minettia*) *grandis* Kertész, 1915: 529, Fig. 15 [male genitalia, lateral]. Type locality: Taihorinsho [=Dalin Township, Chiayi County, Taiwan] VIII. 1909.

Holotype male (HNHM): 1) Formosa Sauter; 2) Taihorinsho, 1909. VIII.; 3) [Kertész's handwriting] "Laux. Minettia grandis Kert." [red] "typus" det. Kertész; 4) [Kertész's handwriting] "L. Min. grandis n. sp. № 9"; 5) [red margined] Holotypus "L.(Minettia) grandis Kertész, 1915 [L. Papp's handwriting] – [on the reverse side] "labelled by L. Papp, B.I. 6.95 mm". The holotype is in a good state of preservation. It is on a 0 size pin; abdomen with genitalia has been removed and prepared, and now is kept in a microvial with glycerol on the same pin. Its right wing is damaged: a small piece is lost from upper subapical margin. Its right fore leg with coxae and ventral parts of thorax below head, as well as clypeus with a part of proboscis and lower 1/6 of eye had been eaten by *Anthrenus* larvae.

Measurements of the holotype in mm: body length 6.95 (vs Kertész's 6.8), wing length 6.90 (vs Kertész's 6.78), wing width 2.70. (That is, Kertész was quite precise at measurements.)

Longest arisal rays 0.22–0.23 mm. Subapical brown spots on R_{2+3} , R_{4+5} and M_{1+2} are not confluent, though areas between them slightly darker than membrane elsewhere.

Male genitalia. Cercus (Fig. 2) slightly more protruding than in *H. pseudograndis* (this may be a characteristic of the specimen preservation only), some of its setae longer than 0.3 mm. Hypandrium (Figs 7–8) strongly asymmetrical, its apodeme short and rounded; left half with a comparatively short slightly medio-clinate process with small double basal teeth, medial tooth emerges far from left process (Fig. 8); right process straight, strongly medially directed with 3 basal and sub-basal teeth. Surstylus with less broad base, caudal extension narrow; outer (lateral) surface (Fig. 1) with some long marginal setae and several short and thinner additional setae, inner (medial) surface (Fig. 3) with short triangular, mostly sharp, pegs on its $\frac{3}{4}$ length. Postgonites (Figs 13–14) in 3 processes: direct connection of phallapodeme to the medial process only (Fig. 13), lateral (double) process connected to phallapodeme through membranes. Inner process almost straight, shorter than medial arm of the lateral processes and only slightly longer than half of that of *H. pseudograndis*, lateral pair of processes (Fig. 14) with a broader and slightly shorter medial arm and a thinner longer lateral arm. Phallus (Fig. 11) more curved in lateral view than in *H. pseudograndis*, apical $\frac{1}{3}$ higher, base sharpened in lateral view. Phallapodeme shorter and more curved than in *H. pseudograndis*.

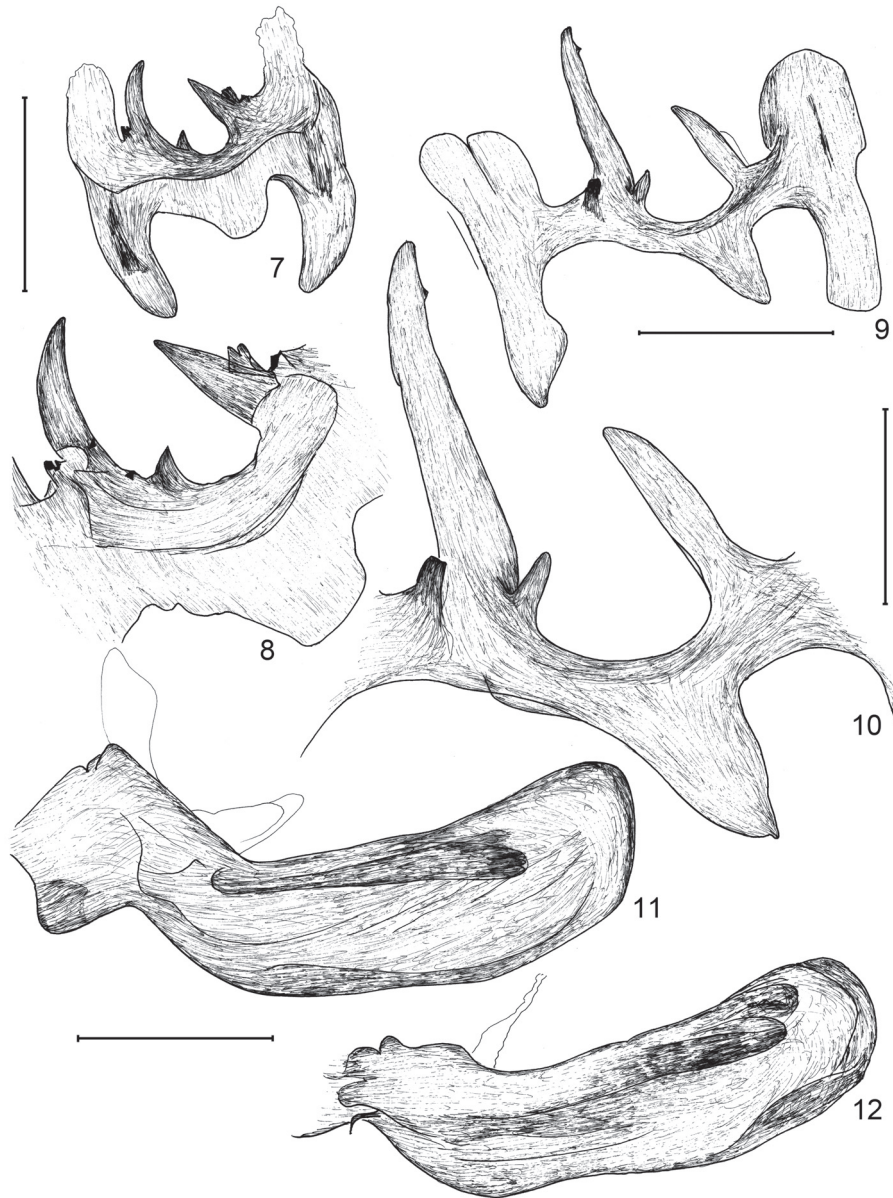
Additional specimens (HNHM): 1 male 3 females: Formosa Sauter – Kankau 1912. V. – „grandis Kert.” det. Kertész. Right wing of one of the females is missing. Probably that was used to make a wing specimen on slide; however, no such wing specimen was found in KERTÉSZ's bequest.

***Homoneura pseudograndis* sp. n.**

(Figs 4–6, 9–10, 12, 15)

Holotype male (HNHM, on a No. 1 collection pin): 1) Formosa Sauter; 2) Mt. Hoozan 1910. "V."; [Kertész's handwriting] "grandis Kert." Det. Kertész. In a good state of preservation; its hind legs as well as abdomen with genitalia are prepared, and now is kept in a microvial with glycerol on the same pin.

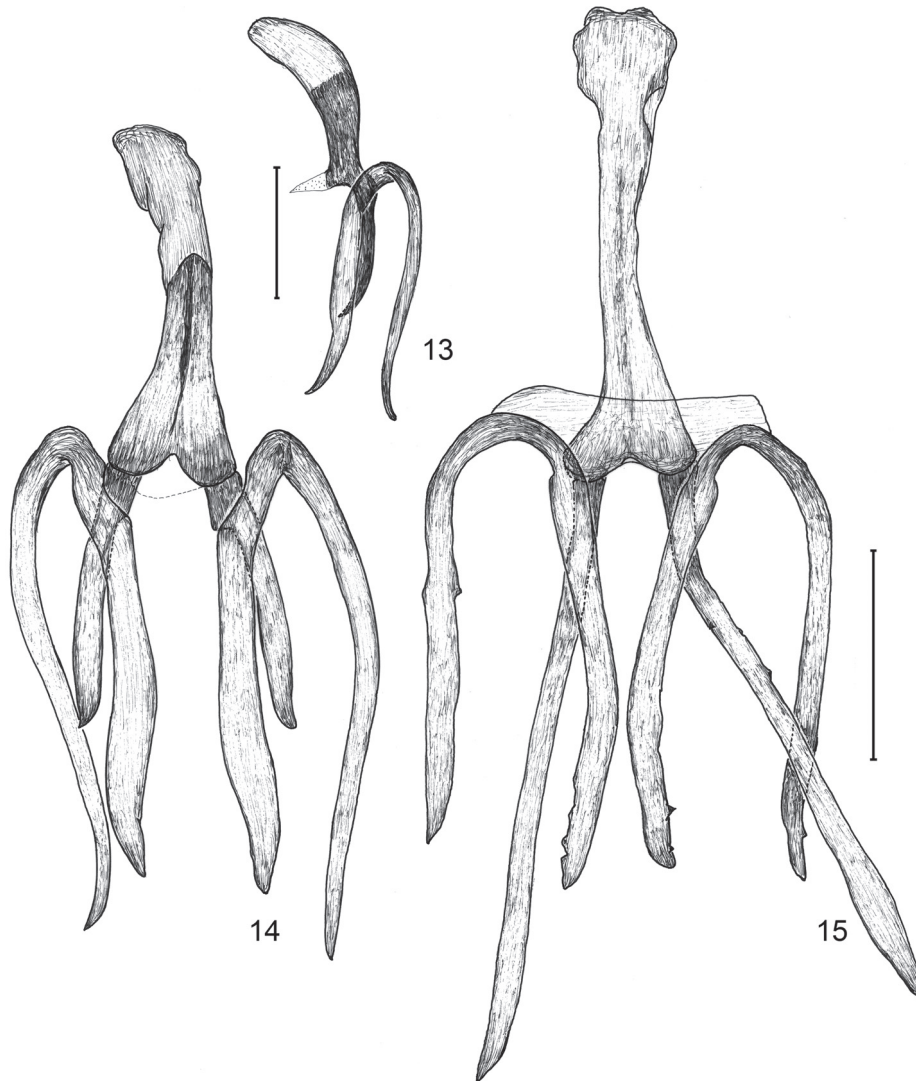
Measurements in mm: body length 7.04, wing length 6.96, wing width 2.75.



Figs 7–12. *Homoneura* species, male genitalia. 7–8 = *H. grandis* (Kertész, 1915), holotype: 7 = hypandrium, ventral view, 8 = medial part of hypandrium in higher magnification. 9–10 = *H. pseudograndis* sp. n., holotype: 9 = hypandrium (slightly flattened), ventral view, 10 = medial part of hypandrium in higher magnification. 11–12 = phallus, lateral view: 11 = *H. grandis* (Kertész, 1915), 12 = *H. pseudograndis* sp. n. Scales: 0.4 mm for Figs 7, 9, 11–12, 0.2 mm for Figs 8, 10.

Body as in the other species of the group. Longest arisal rays 0.20 mm. Subapical brown spots on R_{2+3} , R_{4+5} and M_{1+2} confluent, proximal spot on R_{4+5} 0.75 mm long (in 4 of 5 specimens of *H. grandis* that is c. 0.50 mm).

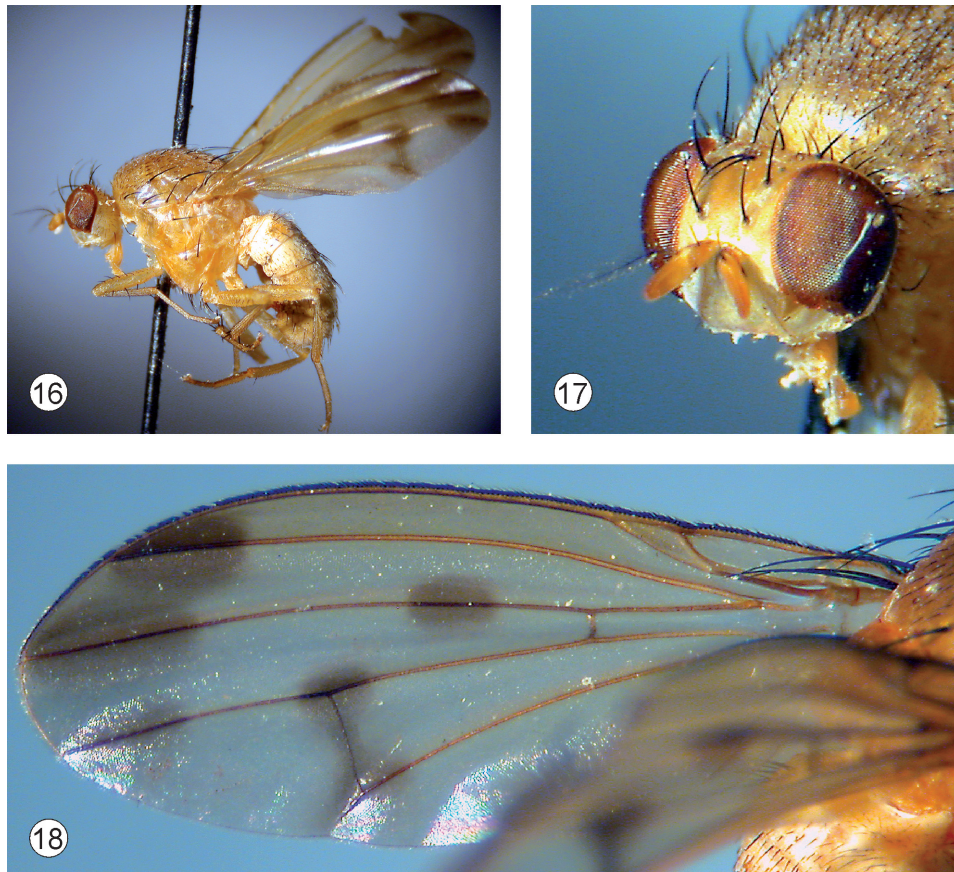
Male genitalia. Cercus (Fig. 4) rounded, its longest setae slightly longer than 0.2 mm. Hypandrium (Figs 9–10) strongly asymmetrical with an asymmetrical triangular apodeme,



Figs 13–15. *Homoneura* species, male genitalia. 13 = *H. grandis* (Kertész, 1915), holotype, phallapodeme and postgonite, overall, slightly sublateral view. 14–15 = phallapodeme and postgonites, ventral view: 14 = *H. grandis* (Kertész, 1915), holotype, 15 = *H. pseudograndis* sp. n., holotype. Scales: 0.5 mm for Fig. 13, 0.4 mm for Figs 14–15.

left half with a longer process, which bears a small subapical tooth, medial tooth just on the base of left process; right half with a digitiform process, which is slightly longer than in *H. grandis*. Surstylus larger than in *H. grandis*, caudal extension broad, with 2 small anterior basal projections; outer (lateral) surface (Fig. 5) with similar marginal setae as in *H. grandis*, but other setae finer, inner (medial) surface (Fig. 6) with small sharp pegs on its apical 1/3 only. Postgonites (Fig. 15) structurally the same as in *H. grandis* (direct connection of phallopodeme to the medial process only, lateral processes connected to phallopodeme through membranes). Inner process is the longest one, straight and thin, arms of the lateral pair of processes (Fig. 15) subequal, medial arm only slightly broader than lateral one. Phallus (Fig. 12) with less sharpened base, and slightly narrower apical third than in *H. grandis*. Phallopodeme longer and less curved than in *H. grandis*.

H. pseudograndis sp. n. is different from *H. grandis* mainly in characteristics of male genitalia as described above. This is the case also with other unde-



Figs 16–18. *Homoneura grandis* (Kertész, 1915), holotype, male: 16 = adult, 17 = head, dorsal view, 18 = left wing. (Photos S. D. Gaimari)

scribed species of the group. Its species distinctness is underlined by the fact that it is sympatric with *H. grandis* (or almost so; considering the comparatively small area size of Taiwan but knowing well the extreme relief of its regions/sceneries, one must be careful in judging this kind of question).

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