

NOTHYBIDAE, A NEW FAMILY OF DIPTERA

by

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The generic name *Nothybus* was proposed by RONDANI (1875, 439) for *longithorax* RONDANI 1875, from Borneo. OSTEN-SACKEN (1882, 195-196, 199) redescribed and listed *Nothybus* as a genus of *Tylidae* (*Micropeziidae*), distinguishing it from the other genera in his key to the Philippine genera, as follows :

- „A. Fore coxae inserted close by the two other pairs, but very far from the head, the thorax being conspicuously developed in front of them *Nothybus* RONDANI.
— Fore coxae inserted near the head, and at a more or less considerable distance from the two other pairs.”... Other genera of „*Micropeziidae*”.

Later, VAN DER WULP (1896, 112) described *biguttatus* from Java as *Nothybus*; BRUNETTI (1931, 187) described *kempi* from India as *Psila*, and BEZZI (1917, 155) described *triguttatus* from the Philippine Islands (Mindanao) as *Nothybus*.

The first attempt to bring together the published information on the species of *Nothybus* was made by ENDERLEIN in his „Klassifikation der Micropeziden” (1922, 163, 175-176), when he listed 4 species as belonging to this genus, described 2 species (*lineifer* and *sumatrana*) new to science both from N. E. Sumatra and reported having seen specimens of *longithorax* RONDANI, also from Sumatra. Later, DE MEIJERE (1924, 30) described the seventh and last known species (*decorus*) from Sumatra. The genus then remained untouched, until now no new species having been described. ENDERLEIN was the first author who expressed doubt that this genus belonged to the Tylidae : „Ob diese Gattung überhaupt in dieser Familie zu der richtigen Stelle ist, erscheint mir sehr zweifelhaft; sie ist wohl hier infolge der langen dünnen Beine eingegliedert worden; zu den Psiliden, wohin BRUNETTI eine Art stellt, gehört dieses Genus auch nicht”.

Some years later FREY (1927, 66) adhered to the opinion of ENDERLEIN: „Die Stellung der Gattung *Nothybus* ROND. ist, wie auch ENDERLEIN bemerkt, zweifelhaft. Bei dieser Gattung haben die hinteren Schenkel keine Borsten am Hinterrande, weiter fehlen die Ozellaren und Humeralen, alles wie bei den Calobatinen' (= *Trepidariini*) „in dem Borstenbüschel an der Basis des Hintermetatarsus erinnert sie an die Calobatinen und Tanypeziden, in der starken Entwicklung des Prothorax dagegen an die Neriiden. Wahrscheinlich muss man für diese Gattung eine neue Familie, *Nothybidae*, errichten, die wohl am besten in die Nähe der Tanypeziden zu stellen ist.”

HENNIG, in his outstanding „Revision der Tyliiden" (1936, 229), remarked only: „*Nothybus* ROND. Stellung unsicher”.

After completing his revision of the Argentine *Tylidae* and *Neriidae*, the author received from Dr. M. A. LIEFTINCK, former director of the Museum Zoologicum Bogoriense, Bogor (Java), through the intervention of Dr. FRED KEISER of the Naturhistorisches Museum Basel (Switzerland), interesting and abundant material of *Tylidae* and *Neriidae* from Indonesia and New Guinea. These were studied and identified, including specimens of two *Nothybus* species. To both of these entomologists the writer expresses his gratitude: without their assistance this study could not have been carried out.

On seeing the mentioned material the writer decided that a revision of the genus and that of its proper taxonomic placing on a comparative morphological basis was called for. The most important result of this study is the necessity to erect a new family for the genus *Nothybus* as proposed formerly by FREY (1927), and to erect for this family a new superfamily of the *Brachycera Schizophora*, equivalent to the superfamily *Acalyptratae*, since the species of this genus combine discrepant characters in a very unusual manner. The general organization of their body is very similar to that of some lower acalyptrate flies of the group *Tanypezidiformes*, but the male has 6, the female 7 complete preabdominal segments, the female lacks an oviscap, and the male postabdomen is as entirely symmetrical as it is in the *Brachycera Orthopyga* flies.

S y s t e m a t i c p o s i t i o n

It is difficult to find a proper place for the monogeneric family *Nothybidae* because of its strikingly disharmonious characters.

The species belonging to it have antennae as specialized as the *Syrphidae* (*Aschiza*) and *Schizophora*, and the general structure of their head,

thorax, abdomen, wings and legs is very similar to that of the acalyptrate flies. Besides, they have a functional ptilinal fissure on their frons, which is rather short and nearly horizontal (not horseshoe shaped with descending branches). The family *Nothybidae* belongs consequently to the suborder *Brachycera*, into the series *Schizophora* of the cohorts *Campylopyga*. However, it stands more isolated in *Schizophora* (or the muscoid flies) than the family *Conopidae* for which the superfamily *Conopoidea* was erected by HENDEL. It represents the only *Campylopyga* group with the male postabdomen entirely symmetrical but epandrium folded beneath the last preabdominal tergite. All other *Campylopyga* families have the male postabdomen asymmetrical and circumverted.

It follows that the family *Nothybidae* is of a great phylogenetic importance since it apparently contains the few surviving descendants of some ancient *Acalyptrata* group in which the character of the circumverted male postabdomen never developed. This little relic group of 7 oriental species represents therefore not only a distinct genus and family but simultaneously the fourth superfamily of *Schizophora*, the *Nothyboidea*.

The superfamily *Nothyboidea* evidently contrasts with the *Conopoidea*. In regard to the general structure of their body the conopid flies would much better form part of the *Aschiza* (superfamily *Syrphoidea*) than of the *Schizophora*, but they happen to have also a functioning ptilinal fissure which progressive character is in strange opposition to the majority of the general features. On the contrary the nothybid flies, in regard to the organization of their body, belong to the superfamily *Acalyptratae* but they also have a completely symmetrical male postabdomen as in the *Brachycera Orthopyga*, which is a strikingly discrepant primitive character in these flies.

Key to the superfamilies of *Schizophora*

1. Anal cell (*Can*) mostly long and wedge-shaped; subcostal vein connected with the first branch of radius (r_1) by a short preapical ramification (sc_2) „Vena spuria” mostly present. Male postabdomen asymmetrical and circumverted *Conopoidea*
- 1'. *Can* short or absent; *sc* never branched before its tip, sc_2 and „vena spuria” always absent.
2. Male postabdomen completely symmetrical. Prothorax conspicuously prolonged in front of the front coxae; head never prolonged. Post-

- scutellum conical and longer than the scutellum. Female without oviscape *Nothyboidea*.
- 2'. Male postabdomen asymmetrical and circumverted. (Other characters never present simultaneously.) . . . *Acalyptratae* and *Calyptratae*

Comparative morphology of the family

The nothybid flies have many characters similar to those of the family group *Tanypezidiformes* of *Acalyptratae*. In fact they have so much in common that the writer cannot consider this phenomenon as a casual convergency but prefers to introduce the hypothesis that the nothybid flies are the surviving descendants of some ancestor of recent acalyptrate flies with symmetrical male postabdomen, which shared alike some evolutionary tendencies with recent *Tanypezidiformes*. On the other hand, the families of the *Tanypezidiformes* appear to stand at the base of the main stem of *Acalyptratae* since they have apparently preserved more phylogenetically old characters than the other groups, which characters are, however, as strangely mixed with various specialized and more recent ones as is usual in all monophyletic groups.

The characters of *Nothybidae*, similar to those of *Tanypezidiformes* are as follows :

General structure of the head. On the frons there is a frontal stripe, as narrow as in some *Eurybatini* (*Trepidariinae*, *Tylidae*); genoverical plates with the hind superior orbital bristle (*orss*) on their strongly chitinized hind part, and fore superior orbital bristles (*orsa*) on their less chitinized anterior part. The small ocellar plate is placed in front of the middle of the frons, as in some *Taeniapteridae* and *Tylidae*. The shape and structure of the mouth parts are very similar to those of the *Neriidae*. The head is wider than long or high and usually slightly higher than long, as in many *Taeniapteridae*.

Prothorax conspicuously projected as in the more specialized forms of *Neriidae* *Trepidariinae*, but whereas in *Nothybidae* the fore coxae are placed far away from the head, in the *Tanypezidiformes* they are placed always near the head.

Postscutellum conical and very large, longer than the scutellum, occupying the major part of the mediotergite, as in the genera *Nestima* OSTEN-SACKEN (*Trepidariinae*) or *Mesoconius* ENDERLEIN (*Taeniapteridae*).

Wings as long and narrow with the axillary lobe and alula entirely reduced as in *Tylidae*, etc., but the first posterior (Cp_1 or apical) cell of the *Nothybidae* never narrowed towards the apex, etc.

Legs long and slender as in the families of *Tanypezidiformes*, but tarsi considerably longer in *Nothybidae* than the femora or tibiae, while in *Tanypezidiformes* only in the *Tanypezidae* the tarsi are as long as, or slightly longer than the femora. Fore basitarsus entirely or partly whitish as in many species of *Taeniapteridae*. Basis of the hind basitarsi ventrally thickened, this small thickening bearing a tuft of bristly hairs as in *Tanypezidae*, etc.

Preabdomen elongated and narrow, sternites reduced to narrow stripes.

In view of the fact that *Nothybidae* and *Tanypezidiformes* have many characters in common, it must be evident that the species of this family cannot be determined as anything else than *Tanypezidiformes* by both keys of HENDEL (1928 and 1937), and by both keys of CURRAN (1934 and 1942).

Nevertheless, the nothybid flies may be easily distinguished from all natural groups of the *Tanypezidiformes* by the divergent third and fourth wing veins, by the prothorax conspicuously projecting in front of the fore coxae, by the presence of a mesopleural (*mpl*) bristle, and by the absence of an oviscape in the female. They differ furthermore from all natural groups of *Tanypezidiformes* except *Tanypezidae* by the presence of two pairs of strong scutellar bristles (*sc*) and they differ from the *Tanypezidae* by the absence of the axillary lobe and alula, as well as by the absence of the ocellar (*oc*) and humeral (*h*) bristles. It may be noted that CRAMPTON (1942, 58) identifies alula with the axillary lobe but the writer, following the designation of many other dipterists, is applying the term axillary lobe to the lobe placed distad to the axillary incision; never to the smaller lobe (alula) placed proximad to the same incision.

Nothybus RONDANI 1875

1875. *Nothybus* RONDANI, Ann. Mus. Civ. Genoa 7: 439 (Type *longithorax* RONDANI).
1882. *Nothybus* OSTEN-SACKEN, Berliner Ent. Zeitschr. 26: 195—196.
1922. *Nothybus* ENDERLEIN, Arch. f. Naturgesch. 88 A 5: 175.
1927. *Nothybus* FREY, Notulae Ent. 7: 66.

Much remains to be learned concerning the geographical distribution of the species of this exclusively oriental genus. The 7 known species were described from India (1), from the Philippine Islands (1), and from Java, Borneo and Sumatra in Indonesia (5). The centre of the genus lies apparently in Sumatra from where 4 species are known.

Nothing is known concerning the morphology of the early stages and the biology of the species included herein, which fact represents a considerable gap in our knowledge of *Diptera*.

The general morphological characters of this small relic group are the following :

Head suborbicular, wider than long or high and slightly higher than long. Occiput above the foramen magnum and between the vertical bristles conspicuously concave, only the small inferior region of the cerebral plate is protruding. Eyes bare, more or less higher than long ; ommatidia uniformly small.

Frons wide in both sexes and slightly concave, bulging above the antennae. Frontal-stripe very narrow and situated in the anterior half of the frons. There must be the same frontal structure present as in the *Tanypezidiformes*; the parafrontal plates do not ascend to the frons, which consists only of the genovertical plates, since the fore orbital bristle pair is very closely placed and as reclined, as the hind orbital bristle pair. The hind superior orbital bristles (*orss*) stand on the more chitinized and shining hind part of the genovertical plates, and the fore superior orbital bristles (*orsa*) stand on the less chitinized dull fore part of the same plate. The apparently functioning ptilinal fissure is nearly horizontal, without descending lateral branches. The „face” (= mesofacial plate and parafacial area) is slightly convex, well chitinized, and, in profile, nearly vertical or its epistomal region is slightly protruding on the middle as in many syrphid flies.

Antennal foveae shallow. Here it may be mentioned that on the mesofacial plate of the *Tylidae* and *Taeniapteridae* only the shallow antennal depressions and the narrow parafacial plates are well chitinized but a large triangular area between and below them is nearly or wholly membranous.

The eyes are bordered below only by a linear margin of the mouth opening. Mouth parts very similar to those of the *Neridae*. Antennae similar to those of the acalyptrate flies, arista long plumose except the basal half below, basis widened.

There are 4 pairs of long and strong, reclined head bristles present: 1 *orsa*, 1 *orss*, 1 *vti* and 1 *vte*.

Prothorax conspicuously projected in front of the fore coxae ; projected anterior region situated in front of the fore coxae slightly longer than the rest of the thorax. Consequently, the fore coxae stand unusually far from the head and relatively as far from the mid- and hindcoxae as in the *Tanypezidiformes*. On the hind half of the thorax there

are 7 pairs of well developed reclined bristles : 1 *npl* placed on small protuberance, 1 *mpl*, 1 *sa*, 1 *pa*, 1 (prescutellar) *dc* and 2 *sc* (basal and apical pairs).

Scutellum flattened, triangular ; postscutellum conical, conspicuously large, slightly longer than the scutellum, occupying the major part of the mediotergite.

Mesonotum with many longitudinal rows of bristle-like hairs ; pleurae bare, except some scattered hairs around the *npl* and on the pleurotergites. Anepisternum (mesopleura) larger than the katepisternum (sternopleurite).

Wings narrow and long, slightly pointed at the apex, in the two examined species 3.3-4.1 times longer than wide. Costa not broken or fractured. Axillary lobe and alula absent. Wing venation in general very similar to that of the acalyptrate flies but showing some small outstanding characters by which this family may be well distinguished from all the others. All veins (except the costa) are completely bare on both surfaces of the wing.

Subcosta (*sc*) complete, ending independently. First longitudinal vein (r_1) very short, ending close to the tip of subcosta, stigma therefore short and indistinct as in *Neriidae* and *Tylidae*. The second (r_{2+3}) to fifth (cu_1) veins are long and nearly straight, diverging; third vein (r_{4+5}) ends in the wing apex, the tip of the second vein is exactly or nearly exactly opposite the tip of the fourth. Costa continuing beyond the apex of the wing, attains the tip of the fourth vein (m_1).

Apex of the second basal cell (Cb_2 or *M*) open, since the vein m_2 which separates this cell from the first basal cell (Cb_1 or *R*), ceases abruptly before attaining the cross-vein m_3 which separates the Cb_1 from the discoidal cell (*Cd*). The writer does not know another dipterous family which shows the same characters. Anal cell small and narrow, of characteristic shape, its petiole is minute.

Basal fourth to third of the wing margin bordered by a weak and linear costa which becomes more conspicuous distad to the tip of the petiole of the anal cell (*Can* or *Cu*) and terminates strongly weakened.

The writer observed structural colour on a dipterous wing for the first time in this family. The wing membrane of both redescribed species, when observed nearly parallel to its surface emanates a certain shade of violet. This structural colour is conspicuous, rich and luminous on the wings of *N. longithorax*, faded and inconspicuous on the wings of *N. biguttatus*.

Calypters very narrow, the thoracic one linear.

Legs long and slender as in *Tanypezidiformes*. Tarsi conspicuously longer than the corresponding femora or tibiae. Mid tibia with a strong spur. Base of the hind basitarsi ventrally with a small thickening which bears a tuft of bristly hairs. Claws and pulvilli relatively very small.

mm	<i>Nothybus</i> <i>biguttatus</i> V.D. WULP		<i>Nothybus</i> <i>longithorax</i> RONDANI	
	♂	♀	♂	♀
	Fore legs			
Total length	12.68-10.63	7.18-10.88	12.04	11.87-12.45
femur	3.52- 3.00	2.00- 3.06	3.30	3.25- 3.59
tibia	3.82- 3.18	2.18- 3.32	3.70	3.82- 3.86
tarsi	5.34- 4.45	3.00- 4.50	5.04	4.80- 5.00
(Basitarsi)	2.57- 2.23	1.36- 2.27	2.31	2.29- 2.31
	Mid legs			
Total length	14.96-12.54	8.59-13.04	14.16	13.79-14.05
femur	4.22- 3.66	2.50- 3.82	3.91	3.93- 4.09
tibia	4.61- 3.88	2.75- 4.09	4.45	4.54- 4.54
tarsi	6.13- 5.00	3.34- 5.13	5.80	5.32- 5.42
(Basitarsi)	3.41- 2.72	1.70- 2.86	3.02	3.04- 2.95
	Hind legs			
Total length	14.56-12.20	8.28-12.66	13.92	13.65-14.71
femur	4.70- 4.02	2.88- 4.36	4.43	4.50- 5.00
tibia	4.32- 3.66	2.54- 3.80	4.09	4.00- 4.31
tarsi	5.54- 4.52	2.86- 4.50	5.40	5.15- 5.40
(Basitarsi)	2.68- 2.09	1.25- 2.11	2.65	2.52- 2.54

Preabdomen elongated and narrow; male with 6, female with 7 normal and complete preabdominal segments, (*Tanypezidiformes* with 6 in both sexes): the last segment may be reduced. The basal two tergites form a syntergite (1st + 2nd) but the first and second sternites remain separated (as in *Acalyptratae*). The spiracles are placed in the membrane near the lateral margin of the tergites. Sternites reduced to narrow stripes, except the first and the sixth.

Male postabdomen as completely symmetrical as that of the female, not circumverted nor torsioned. Epandrium folded beneath the sixth tergite; hypandrium relatively well developed bearing a terminal process (dististyli). Surstyli may be blunt or biparted. Aedeagus wide and short.

Key to species

This key is a very preliminary one since the writer knows only 2 species of the 7 described and would be obliged to entomologists or to in-

stitutions for the loan of further material, which assistance would greatly facilitate a modern revision of this interesting group of flies.

1. Only species described from Java. Ocelli placed definitely before the middle of the distance between *orsa* and *vti* bristles. Mesofacial plate without black markings. Wing apex distad to an oblique line between tip of second vein (r_{2+3}) and hind cross-vein (*tp*) brown, and includes two small milky-white opaque spots, one in the submarginal cell (R_3) and another in the first posterior cell (R_5). Anterior cross-vein (*ta*) bordered with brown and placed nearly in the middle of the discoidal cell. Thorax and abdominal tergites dark yellowish red to reddish brown, each one of the second to fifth tergites with a more or less elongate dull black median triangular spot. Tibiae dark brown, tarsi blackish, middle third of the fore basitarsi yellow. Length 8.5-13 mm . . . *N. biguttatus* v.d. WULP 1896 (♂♀).
— Species described from elsewhere. Wing pattern and combination of characters different.
2. Only species known from the Philippine Islands (Mindanao). Ocelli placed just halfway between *orsa* and *vti*. Mesofacial plate whitish below, at its middle with a prominent, oval, glistening blackish brown tubercle. Apical third of wing infuscated distad to an oblique narrow brown band which runs from tip of r_{2+3} vein to tip of the fifth vein, traversing the *tp*, and includes 3 conspicuous, oval, subhyaline spots (one in the R_3 , one in the R_5 and one in the second posterior - M_1 - cell); *ta* not bordered with brown, and placed before middle of the discoidal cell. Thorax and abdomen entirely yellow, seventh tergite whitish dusted. Tibiae and tarsi black, only basitarsi of the fore legs whitish. Length 7 mm . . . *N. triguttatus* BEZZI 1917 (♂)
— Species described from elsewhere. Abdomen at least partly dark coloured, not wholly yellow.
3. Only species described from India (NE frontier : Kobo). Mesofacial plate with a black median vitta. Apical wing margin very narrowly brown suffused; an oblique narrow brown band of irregular width from tip of r_{2+3} to tip of fifth vein, traversing the *tptr*; a brown streak, variable in extent, widest at the middle, borders the posterior side of the distal half of the fifth vein; *ta* lacks a brown border. Thorax light ferruginous, dorsum of scutellum wholly blackish; abdomen dull black, „basal half of the first segment and genitalia” yellow. Tibiae and tarsi black but fore basitarsi pale yellow. Length 5.5 mm *N. kempfi* (BRUNETTI) 1913.

- Species described from Sumatra or Borneo. Distal half of the fifth vein never bordered with brown.
4. Distribution : Borneo and Sumatra. No conspicuous wing-pattern present; wing hyaline, marginal and submarginal cells (R_1 and R_3) yellowish, wing apex suffused pale brown; ta lacks a brown border and placed in the basal third of the discoidal cell. Thorax reddish yellow; abdomen brown, fifth tergite of both sexes dull blackish brown. Tibiae and tarsi blackish brown, basal three fourths of the fore basitarsi whitish. Length 12-14. mm
 *N. longithorax* RONDANI 1875 (♂♀).
- Species described from Sumatra.
5. Tibiae and tarsi black; fore basitarsi, except the narrow apex, pale yellow. Mesofacial plate below („clypeus”) at the middle glistening black. Wing apex distad to the usual oblique brown cross-band, pale brown in colour and includes 3 large hyaline spots (one in the R_3 , another in the R_5 and the third in the M_1 cell); ta bordered with brown. Thorax brown to dark brown; abdomen glistening black, but basal region of the first segment reddish yellow, fourth tergite dull black, sixth tergite and postabdomen pale yellowish. Length 5-6 mm
 *N. sumatranus* ENDERLEIN 1922 (♂)
- Mid and hind tarsi black but fore tarsi entirely pale yellow.
6. Wing pattern as in *kempi* (oblique brown cross-band, apical wing margin with narrow brown border) but fifth vein lacks a brown border. Length 7¼ mm *N. lineifer* ENDERLEIN 1922 (♂♀)
- Wing hyaline, distad to the usual oblique, dark brown cross-band, there are 3 brown spots, each one on the tip of the second, third and fourth veins; the spot of the fourth vein is connected along the posterior wing margin with the oblique brown cross-band; ta bordered with brown and placed slightly distad to the middle of the discoidal cell. Thorax dull blackish grey to black; abdomen shining blackish gray but hind region of the second tergite and the whole seventh tergite reddish yellow, and fifth tergite together with the lateral sides of the sixth, dull black. Lower half of the mesofacial plate glistening black except the yellowish lateral regions. Mid and hind tibiae black, fore tibiae whitish yellow. 7 mm.
 *N. decorus* DE MEIJERE 1924 (♀)

Nothybus biguttatus v.D. WULP 1896.

W. Java: 2 ♂, ♀, Mt. Gedeh, Tjibodas, 1400 m, 27-31.VIII.1931 (M. A. LIEFTINCK); id., ♂, ♀, Tjibodas, 1400 m, 1923 (H. H. KARNY); ♂, ♀, Tjibodas,

1400 m, 27-29.VII. and 23-30.XII.1930 (M. A. LIEFTINCK); Tjibodas, 1500 m, VIII.1921 (H. H. KARNY). ♀, Mt. Pangrango, 1300 m, Tjisarua, 17.VII. 1932 (M. A. LIEFTINCK). ♂, Djampang, Sukanegara, 700-1000 m, 23-28. XII.1931 (M. A. LIEFTINCK). ♂, Garut, Kamodjan, 1400 m, V.1929 (coll.?). 2 ♂ Mt. Tangkuban Prah, 4-5000 ft., 7.XII.1933 (F. C. DRESCHER).

The only species of *Nothybus* known from Java.

Male. — Body 13.4-11.6 mm long; wings 10.45-8.9 mm long and 2.5-2.4 mm wide, 4.3-3.8 times as long as wide.

Head suborbicular (fig. 1-3), 1.59-1.34 mm long, 1.88-1.66 mm wide and 1.61-1.36 mm high. Frons above the antennae bulging, slightly convex and shining transparent yellow in colour (the narrow frontal stripe slightly darker), excepting three dull velvet black spots, one of which is placed on the occiput behind the small black ocellar plate, and one on each side of the anterior frontal region, marking the less chitinized anterior part of the genovertical plates (or perhaps parafacial plates). Occiput among the vertical bristles deeply excavated, shining transparent yellow in colour, only the small cerebral plate is reddish brown, silvery white dusted. Eyes in profile 1.25-1.13 mm long and 1.50-1.32 mm high, 1.1-1.2 times higher than long. Parafacial plates and the upper two thirds of the mesofacial plate golden yellow, slightly concave; lower third of the mesofacial plate more convex and slightly prominent on its middle, densely whitish dusted except the shining brownish yellow tip of the small prominence. Anteclypeus pale yellow, long. Other mouth parts testaceous yellow, apex of the narrow and elongated maxillary palpi darkened. The usual 4 pairs of reclined long and strong shining black head bristles are present. The closely spaced *orsa* pair is placed in the anterior velvet black spots; 1 *orss*, 1 *vti* and 1 *vte*, the *vte* pair is the shorter and the *vti* pair is the longest of all. Antennae testaceous yellow but postpedicel brownish black except its narrow basal part. Pedicel 0.25-0.20, postpedicel 0.38-0.36 mm long. Arista more than twice as long as the postpedicel, long plumose, except the basal half below; dark brown in colour, only its widened basal part is yellowish brown.

Thorax conspicuously prolonged before fore coxae (fig. 10-11), 5.9-5.1 mm long, 1.9-1.7 mm wide and 2.3-2.3 mm high, dark yellowish red to reddish brown. A median vitta occupies the middle third or less of the mesonotum. Scutellum and upper half of the postscutellum blackish brown. Upper half of the usually long postpronotum (humeral callus) greyish dark brown, covered with bluish grey dusting as the pleurae. Mesonotum with many longitudinal rows of black bristle-like hairs. The usual reclined 7 bristle pairs are present on the hind two fifths of the

thorax; they are long and strong, shining black: 1 *mpl*, 1 *npl*, 1 *sa*, 1 *pa*, 1 *dc* and 2 *sc*.

The *mpl* pair is the shortest, *sa*, *dc* and *npl* slightly longer, *pa* and the 2 *sc* are the longest; both *sc* pairs divergent but the apical third of the apical pair is slightly converging. Pleurae bare excepting some scattered hairs around the *npl* and on both pleurotergites.

Wings (pl. 1 fig. A-B) slightly pointed at the apex and strongly narrowed towards the basis. Axillary lobe and alula absent. Wing membrane hyaline with an intensive cellophane-like shine, as in the *Syrphidae*, basal part and marginal cell intensively yellow tinged, submarginal cell slightly yellowish.

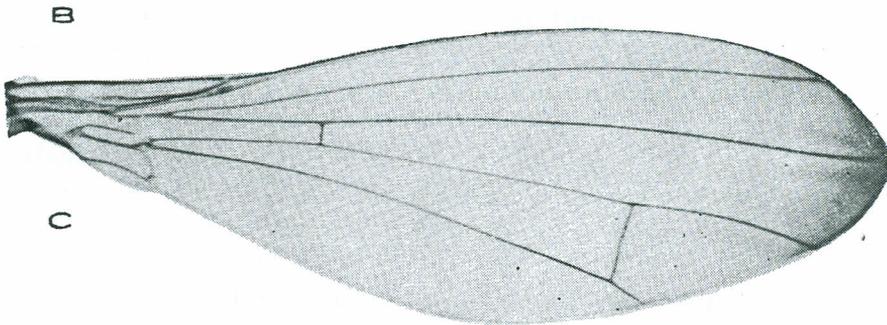
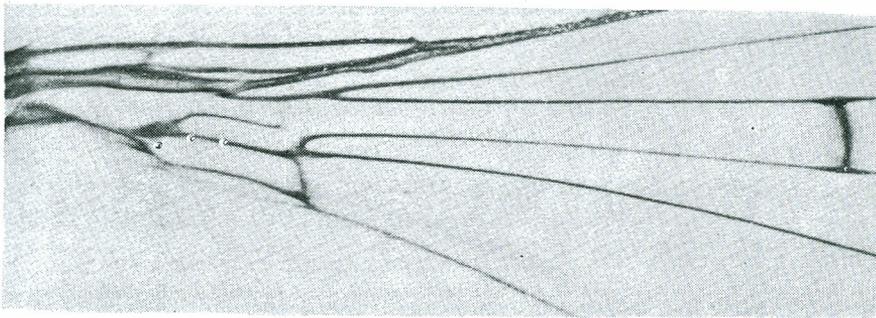
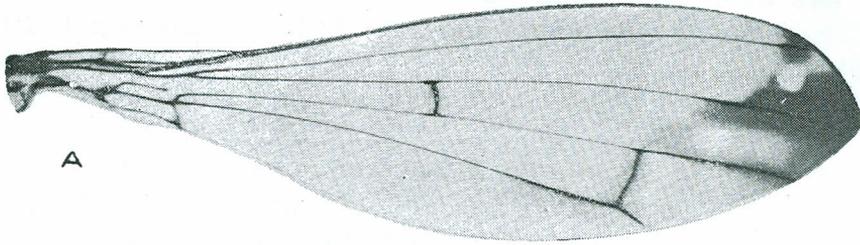
Wing apex distad to an oblique line between tip of 2nd vein (r_{2+3}) and posterior cross-vein (*tp*), brown; the dark brown colour borders the distal third of the fifth vein (cu_1), and the *tp* is placed in this oblique apical band which encloses two milky white opaque spots, one in the submarginal cell (*Csm*) and another one in the first posterior cell (Cp_1). The brown border of *ta* is not connected with the brown apical band. In the second posterior cell there is an indistinct spot, paler brown than its surroundings. First costal section (or stigma) 0.34-0.20, second 6.43-6.13, third 1.11-0.88, and fourth (below the wing apex) 1.09-0.91 mm long.

Prebasal section of fourth vein (m_1) 3.29-3.00, median 2.34-2.11, and distal or ultimate 1.80-1.63 mm long, *ta* placed therefore slightly distad to the middle of the discoidal cell (*Cd*). Halteres pale brown. Calypteres ochraceous yellow with brown border; thoracic calypter linear, upper one but slightly wider.

Coxae and femora testaceous yellow, apices of the femora dark brown to black. Tibiae dark brown, tarsi blackish brown; basitarsi of the fore legs bright yellow except its tip and basal third.

Abdomen 6.0-5.1 mm long and 1.0-0.8 mm wide. Tergites reddish or yellowish to dark brown, slightly shining; each one of the second to fifth tergites with a dull blackish brown to black, more or less long dorsal triangular spot (in both sexes). Sixth tergite slightly more than one half as long (0.57-0.41 mm) as the fifth (0.91-0.75 mm); fourth tergite 1.13-0.97 mm long. Lateral membranes yellowish brown. The narrow, stripe-like sternites are dark brown, only the first and the sixth sternites are wide, wider than long.

Postabdomen (fig. 4-5) completely symmetrical, the short epan-drium dark brown. The long cerci (fig. 6) pale testaceous, the bifid surstyli shining yellowish brown. Aedeagus short and wide, folded, shining black and bordered with shining hyaline membrane. Hypandrium



Pl. 1. — Wings of A and B, *Nothybus biguttatus* VAN DER WULP; C, *N. longithorax* RONDANI.

(fig.7) relatively well developed, with a conspicuous pointed process (dististylj).

Female. — Like the male. Body 8.6-13.1 mm long ; wing 7.0-10.1 mm long and 2.0-2.6 mm wide, 3.5-3.9 times longer than wide. Head 1.04-1.41 mm long, 1.32-1.85 mm wide and 1.09-1.59 mm high. Eyes 0.86-1.09 mm long and 0.98-1.47 mm high. Antennae: pedicel 0.16-0.25, postpedicel 0.30-0.36 mm long. Thorax 3.6-5.6 mm long, 1.48-2.1 mm wide and 1.8-2.4 mm high.

Wing : first costal section 0.18-0.25, second 4.72-6.49, third 0.75-1.09, and fourth 0.70-1.09 mm long. Prebasal section of m_1 2.04-3.31, median 1.61-2.31, and ultimate 1.38-1.82 mm long. Abdomen 4.0-4.5 mm long and 1.1-1.3 mm wide. Preabdomen consists of seven complete segments. Seventh tergite slightly more than one half as long (0.20-0.22 mm) as the sixth (0.34-0.38 mm), fifth tergite about twice as long (0.61-0.93 mm) as the sixth, but shorter than the fourth (0.75-1.13 mm). Ovipositor (figs. 8-9) retractile (an oviscape is absent), eighth segment complete with tergite, sternite and lateral membrane ; terminal complex with well developed proctiger and cerci.

Nothybus longithorax RONDANI 1875

S. Sumatra · ♀ ♂, SW-Lampongs, 600 m, Mt. Tanggamus, xii.1934 (M. A. LIEFTINCK). C. Sumatra: 3 ♀, Wai Lima, Lampongs, xi-xii.1921 (H. H. KARNY).

Male. — Body 12.3 mm long, wing 9.8 mm long and 3.0 mm wide, 3.3 times as long as wide.

Head suborbicular (fig. 12-13), 1.52 mm long, 2.31 mm wide and 1.81 mm high. Frons above the antennae bulging, slightly convex and shining translucent yellow in colour (the narrow frontal stripe slightly darker), except for the usual three dull velvet brownish black spots which are slightly different in shape of those of *biguttatus*, and the small greyish black ocellar plate in *longithorax* is separated from the large occipital spot. Upper half of the „face” (mesofacial plate + parafacial plates) dull rich golden yellow ; on the lower half of the slightly convex mesofacial plate there is a subquadrangular dull brownish black spot, between pale yellow, densely silver white dusted parafacial areas. Occiput shining yellow, in profile almost linear, narrower than in *biguttatus*. Eyes 1.25 mm long and 1.75 mm high. Anteclypeus pale yellow, long oval ; other mouth parts testaceous yellow, labellum brownish ; tip of the maxillary palpi not darkened. The usual 4 pairs of the reclined

strong shining black head bristles (*orsa*, *orss*, *vti* and *vte*) are present. Antennae testaceous yellow, apical two thirds to half of the postpedicel blackish brown. Arista more than twice as long as the postpedicel, dark brown and as plumose as in *biguttatus*.

Thorax conspicuously prolonged in front of the fore coxae, 6.1 mm long, 2.3 mm wide and 2.7 mm high; dull but rich yellowish red in colour (pleurae paler), only the upper half of the long postpronotum (humeral callus) is dark brown, densely covered with an enamel-like dusting which is as greyish silver-shining as mercury. Mesonotum with many longitudinal rows of black bristle-like hairs. The usual 7 pairs of reclined bristles are present on the hind two fifths of the thorax; they are long and strong, bluish black: *mpl*, *npl*, *sa*, *pa*, *dc* and 2 divergent *sc*; the two *sc* pairs are equal in length. Pleurae bare except some scattered black hairs around *npl* and *mpl* bristles and on both pleurotergites.

Wings (pl.1, fig. C) slightly less narrow than in *biguttatus*. Anterior half of the wing yellow tinged, posterior half hyaline, slightly brownish tinged, apical sixth diffuse transparent brown. First costal section 0.45, second 6.02, third 1.00, and fourth 1.18 mm long. Prebasal section of fourth vein (m_1) 1.81, median (between both cross-veins) 3.24, and ultimate 1.95 mm long; *ta* placed slightly distad to the basal third of the discoidal cell, and never bordered with brown.

Coxae and femora intensive testaceous yellow, tip of the mid- and hind femora brown; tibiae and tarsi dark to blackish brown, only the basal three fourths of the fore basitarsi in both sexes white, except a small ventrobasal bunch of minute bristle-like black hairs.

Abdomen 5.0 mm long and 1.2 mm wide. First to fifth tergites shining dark brown, except the reddish yellow basal half to two-thirds of the 1.+2. syntergite. Fifth tergite in both sexes dull velvety brownish black, and in the male almost 4 times as long (0.88 mm) as the testaceous yellow small sixth (0.23 mm); fourth tergite 1.02 mm long. Lateral membranes ochraceous yellow to pale brown; sternites narrow stripe-like, the basal three sternites testaceous yellow, the apical three brown; first sternite almost quadrangular.

Postabdomen (fig. 15) testaceous yellow, completely symmetrical and folded beneath sixth tergite. The opaque testaceous yellow surstyli are short and not bifid.

Female. — Like the male. Body 12.9-14.1 mm long. wing 9.9-10.45 mm long and 2.9-3.1 mm wide, 3.3-3.4 times longer than wide. Head 1.52-1.59 mm long, 2.34-2.50 mm wide and 1.98-1.81 mm high. Eyes 1.20-1.36 mm long and 1.63-1.70 mm high. Antennae: pedicel 0.25-0.25, post-

pedicel 0.36-0.38 mm long. Thorax 6.2-6.4 mm longer, 2.4-2.5 mm wide and 3.0-3.0 mm high. - Wing: first costal section 0.48-0.41, second 6.6-6.7, third 0.95-1.04, and fourth 1.16-1.20 mm long. Prebasal section of m_1 1.81-1.93, median 3.27-3.41, and ultimate 1.93-2.02 mm long. Abdomen 5.7-6.2 mm long and 1.1-1.4 mm wide. Seventh tergite slightly longer (0.41-0.41 mm) than the sixth (0.38-0.36 mm) and almost half as long as the dull velvet black fifth (0.91-1.02 mm). Sixth and seventh tergites testaceous yellow, fourth 1.04-1.20 mm long. Retractable ovipositor (fig. 16-17) testaceous yellow, terminal complex with well developed proctiger and cerci.

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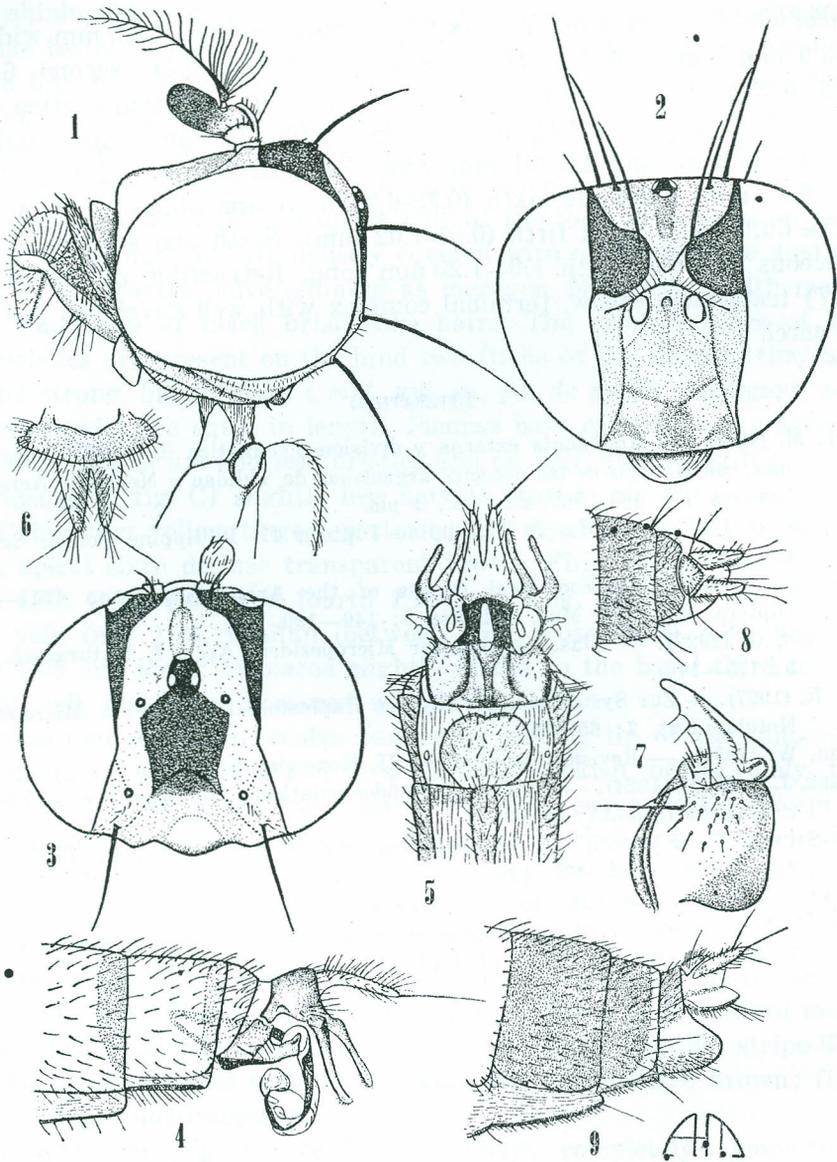


Fig. 1-9. *Nothybus biguttatus* VAN DER WULP. 1, head of ♂, lateral view; 2, head of ♂, front view; 3, head of ♂, dorsal view; 4, postabdomen of ♂, lateral view; 5, postabdomen of ♂, ventral view; 6, epandrium and cerci, dorsal view; 7, hypandrium, lateral view; 8, ♀ postabdomen, dorsal view; 9, postabdomen of ♀, lateral view. All figures except Fig. 7 enlarged on the same scale.

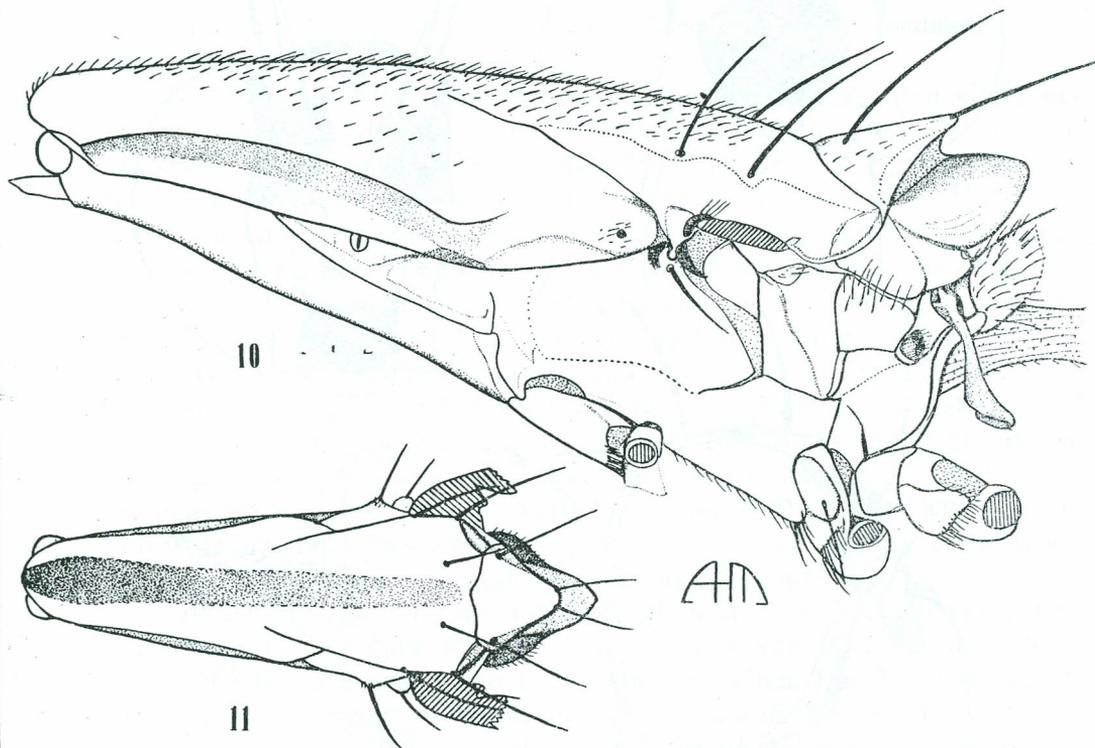


Fig. 10-11. *Nothybus biguttatus* VAN DER WULP. 10, thorax of ♂, lateral view; 11, thorax of ♂, dorsal view. Figures not on the same scale.

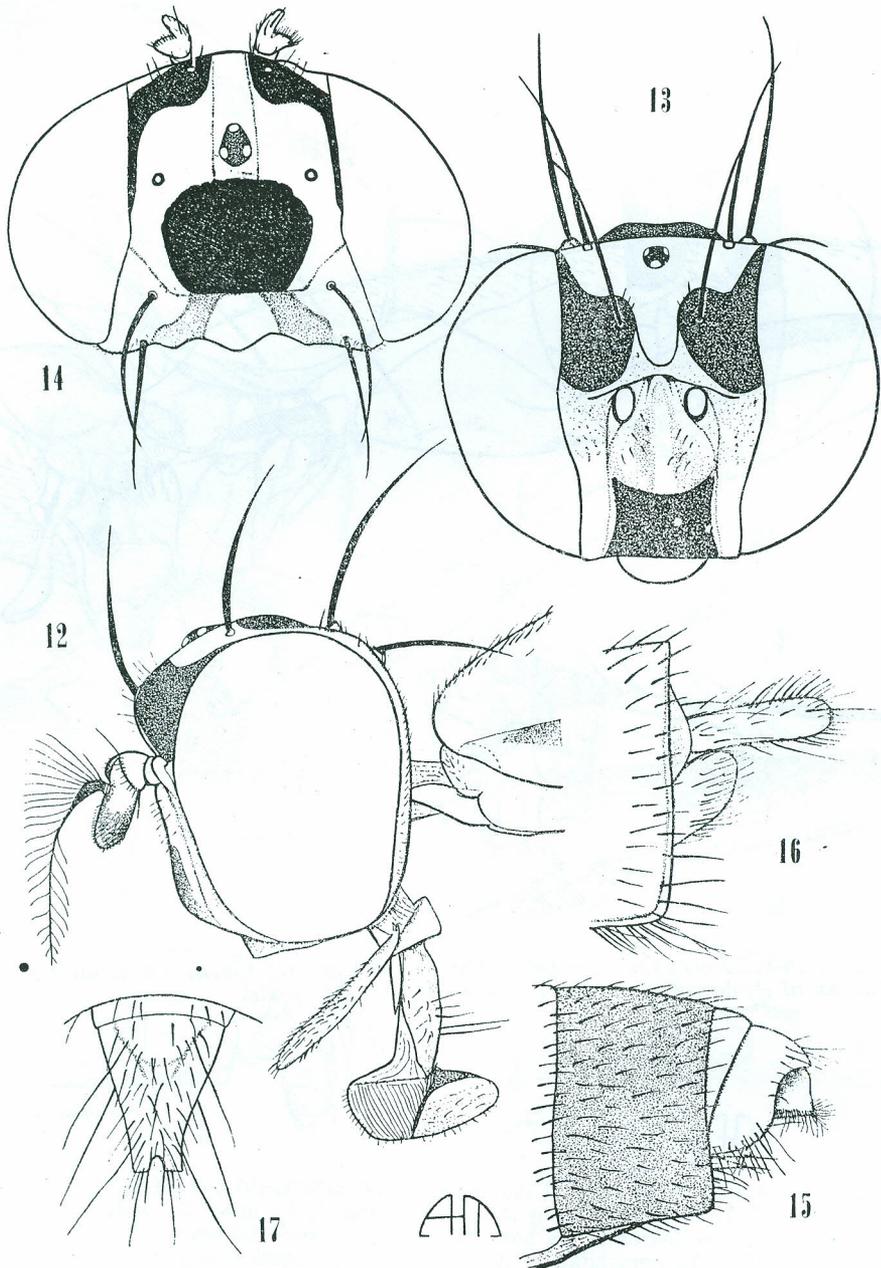


Fig. 12-17. *Nothybus longithorax* RONDANI. 12, head of ♂, lateral view; 13, head of ♂, front view; 14, head of ♂, dorsal view; 15, ♂ postabdomen, lateral view; 16, ♀ postabdomen, lateral view; 17, cerci of ♀, dorsal view. Fig. 16-17 slightly more enlarged than the others.