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THE GENUS *TRABALA* WALK. IN THE
FAR EAST (*Lep. Het.*, fam. *Lasiocampidae*)

BY

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I. INTRODUCTION

The first *Trabala* was described as *Gastropacha vishnou*, by LEFÈVRE 1827: 707, from Madras, India. His diagnosis is based on two females, in the Museum of the Hon. East India Company, London. KOLLAR 1848: 471 described another female of the same species as *Gastropacha sulfurea*, from Masuri, Himalayas. WALKER 1855: 415, 417 created three species, viz. *basalis* ♀, *prasina* ♂ and *pallida* ♂, placing them in the genus *Amydona* which name he changed 1856 in *Trabala*, as he had already used *Amydona* in *Limacodidae*. *Basalis* and *prasina* are synonyms of *vishnou*, only *pallida* is valid, referring to the commonest *Trabala* in Java. WALK. 1856: 1785 considered *pallida* also as a synonym of *vishnou*, but this proves now to be erroneous. The next species described is *mahananda* MOORE 1865: 821 ♂♀ from North East Bengal, being the same as *vishnou*. Afterwards MOORE 1884: 375 and 1884a: 205 introduced two female specimens as *Tr. irrorata*, from Java, resp. Mergui Archipelago. Up to the present, this species remained unrecognizable, and the name *irrorata* became wrongly attached to several other *Trabala* species. An inspection of MOORE's specimen from Java, in the British Museum N.H., shows that we have to do with a valid species. In recent times, two more species were described, viz. *viridana* JOIC. & TALB. 1917: 80 ♂ from North New Guinea, and *leopoldi* TAMS 1935: 45 ♀, from South Celebes. In addition, a number of species are placed in this genus, by their authors, which are not *Trabala*'s. They are listed as follows:

1. *Amydona varia* WALK. 1855: 1415 ♀: Silhet (*ex err., rect.* Africa) = *Lechriolepis varia* WALK.
2. *Amydona laeta* WALK. 1855: 1416 ♂: Silhet, = *Philudoria laeta* WALK.
3. *Trabala niveiceps* WALK. 1865: 554 ♀ = *Euhampsonia niveiceps* WALK. (*Notodont.*!).
4. *Trabala villosipes* WALK. 1865: 555 ♀: Bogota, = *Asbolia villosipes* WALK. (*Limacod.*!).
5. *Trabala splendida* OBERTH. 1881: 65 ♂: Askold, = *Euhampsonia splendida* OBERTH. (*Notodont.*!).

The following species are to be considered as valid:

1. *Trabala vishnou* LEF. 1827: Madras.
2. „ *pallida* WALK. 1855: Java.
3. „ *irrorata* MOORE 1884: Java; Mergui.
4. „ *viridana* JOIC. & TALB. 1917: North N. Guin.
5. „ *leopoldi* TAMS 1935: S. Cel.

In the Malay Archipelago, however, a number of *Trabala*'s occur which could not yet be attributed to one of these species with certainty. The situation was so puzzling to me since many years, that I decided to enter into the question thoroughly, by morphological examination of a rather large material at my disposal, incorporated into the Wageningen collection. In the beginning, one of my students, Mr P. H. VAN DE POL (now as an agricultural engineer and entomologist in our Phytopathological Service) rendered valuable assistance by dissecting a number of specimens, making slides, preparing drawings and arranging the material provisionally. He arrived at the conclusion that several species could be distinguished, but it remained quite uncertain to which of them the names *vishnou* and *irrorata* had to be attributed.

In order to widen the scope of the work, the large material of the Museums Leiden, Amsterdam, Oxford, Buitenzorg and of the Institute for Plant Diseases at Buitenzorg, was received for examination, while several Institutes in India and Ceylon as well as several private persons in Holland placed their material at my disposal. Finally 13 specimens were received from the Smithsonian Institution, U.S. National Museum Washington D.C., under which were 7 from the Philippines and, therefore, of special interest.

During a visit to Stockholm, in August 1948, I could go through the material in the Riks Museet. Special mention must be made of two visits to the British Museum N.H. in London, in March/April 1948 and July/August 1949, where I had the opportunity to study a rich *Trabala*-material and to arrange it provisionally. Mr W. H. T. TAMS who took the greatest interest in this work, examined a large number of specimens morphologically and made microphotograms of the genital structures. He kindly entitled me to publish these photograms here. I wish to tender my heartfelt thanks to all those persons who facilitated my work by their kind help. I feel especially obliged to the Trustees and the Staff of the British Museum N.H.; the unbridled assistance, afforded by the latter and chiefly by my friend, Mr TAMS, is above all praise. Finally, I thank the Holland Help Council, who, by a scholarship, made my first trip to England, in 1948, possible. All in all, certainly far more than 1000 specimens of *Trabala* passed through my hands.

The range of the Eastern *Trabala*'s covers a region extending from Southern Thibet, Central China and Formosa, southwards through India, Ceylon and the Archipelago, as far Eastwards as Celebes, Bali, North New Guinee and the Philippines. It is strange that no species has been recorded from the Lesser Sunda Islands and from the Moluccos, East of Celebes, though in several islands, for instance in Buru, Batjan a.o., extensive collecting has been done at several times. A restricted number of species occurs in Madagascar and in Central and South Africa. They are less known and are omitted here.

The Asiatic *Trabala*'s are sexually highly heteromorphic, the males, when alive, exhibit a delicate green coloration which fades after drying and completely disappears in old museum specimens. The females occur in two or three main colorations, viz. in a yellowish or ochreous one and in a green one. By fading

these colours may also become altered or even lost completely. Both sexes show the common Lasiocampid markings, consisting in fore wing of *anatemediana* (*am*), a discocellular spot (*dc-spot*), a postmediana (*pm*) and a submarginalis (*sm*), see fig. 1. In the male hind wing, the *am* and *dc-spot* are wanting, the *pm* often weaker than in fore wing and more approached to the wing base. The colour of these markings is darker greenish or greenish brown to reddish brown, the *dc-spot* more blackish. The lines are straight or curved and more or less serrate or crenulate, the *sm* undulating and more or less interrupted by the veins. In some species, the male fore wing has a whitish tint chiefly along inner side of *pm*, or is somewhat variegated with white. In the female, the pattern is the same, but the markings are generally coarser, darker and more blackish. Moreover, many females have a big and dark brownish patch along inner margin of fore wing, the subdiscal patch (*sd-patch*), bordered by *am* and *pm* or even surpassing these markings. In certain females this patch is mixed up with whitish scales which may become so prevalent that this patch becomes entirely white. Genetically nothing is known about the occurrence and the behaviour of these colorations; crossing experiments would undoubtedly produce remarkable results.

HORSF. & M. 1859: pl. 22, fig. 3 are the first to give a good figure of the larvae and pupae of what they call *vishnou* from India and Java. MOORE 1882-83: pl. 138, f 1 ♂, 2, 2a ♀♀ figures the male and two green females of the Ceylonese subspecies of *vishnou*. HAMPSON 1893: 422, fig. 293, figures a rather typical *vishnou* ♂. An anonymous writer, probably DE NICEVILLE, 1903: 107, pl. 2 ♂, 2a ♀, 2b (larva), 2c (cocoon) figures *vishnou* again, but without giving the colour of the female. MAXW.-LEFROY 1909: 498, pl. 46, f. 1-7, shows the different stages of *vishnou*, including a green female. The figure in GRÜNBL.-S. 2, 1911: 166, pl. 27a, shows a ♂ and a yellow ♀ of *vishnou*, whereas a ♂ and a green ♀ is figured by the same author in S. 10: 1921: 403, pl. 35e. DUP. & SCHEEPM. 1936: 162, fig. 108, figure both sexes of what they call *vishnou* from Java. The figure, however, is easily recognizable as *pallida* WALK., and the ♀ belongs probably to the mountain form, f. *montana* RPKE. (see p. 113 [11]).

Several species, for instance *vishnou* and *pallida*, deposit their eggs in short, double rows along main nerves, leaf stalks, small twigs &c. of the food plant, covering them rather thickly with adpressed short hairs and more loosely with longer, upright standing hairs, from the anal tuft of the female. These upright

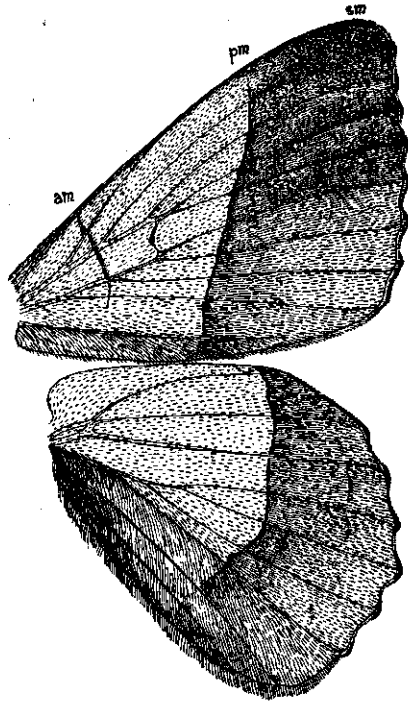


Fig. 1. Wings with venation, of *Trabala pallida* ♂. About $3 \times$ n.s.
Am antemediana; pm postmediana; sm submarginalis.

hairs move up and down in the slightest air current, the egg clusters thus "mimicking" a living worm or something like that. See also MJÖBERG: *Psyche* 33, 1926: 6, pl. 1, who describes and figures the egg masses of a *Trabala* in North Borneo, which he calls *vishnu* (*sic!*), of course erroneously.

Other species, for instance *irrorata* MOORE, produce more compact egg masses, densely covered by a yellowish, felt like hair mass. A green *brahma* ♀, which I captured in the mountains of W.-Java, in August 1919, laid its eggs in short, double rows covering them densely with its dark yellow anal wool. The egg clusters, therefore, are not unlikely to be different in several species. The larva, mostly of *vishnou*, is already described or figured by several authors. I bred a large number of the Javanese *pallida* WALK. from Semarang, Central Java. It is a beautiful, rather variable insect, see pl. 2, f. 1. The head capsule is brownish, with some lighter and darker markings. Dorsally, over the entire length of the body, a yellowish or white streak is running, with at both sides a row of segmental, steel blue tubercles. The coloration of the body is variegated whitish, greyish or brownish, the legs are brownish or reddish. The body is rather hairy, and immediately after the head two long hair brushes are projecting forwards. The dark thoracal incisions, so typical in other Lasiocampids (*Gastropacha*, *Dendrolimus*, *Odonestis* a.o.) are wanting. Some caterpillars turn into a very conspicuous crimson or even dark vinaceous colour which occurs also in the cocoon. According to PIEPERS, 1876: versl. XXIV and 1877: 21, this colour only develops in caterpillars ready for pupation. This observation refers to *Tr. leopoldi* from Makassar; in *Tr. pallida* from Java, it occurs frequently in caterpillars which are still feeding. Furthermore, PIEPERS l.c. states that the caterpillar bears a certain resemblance to that of *Amathusia phidippus* L.; I cannot share this opinion as far as the Javanese *pallida* WALK. is concerned. Furthermore, PIEPERS points out that the caterpillars from Makassar differ distinctly from those from Java; indeed, we have to do with two different species, *leopoldi* TAMS and *pallida* WALK. The pilosity of the Continental *vishnou* caterpillars is more velvety or felt like than in the Javanese *pallida*. Judging from MOORE's figures, the caterpillars of the Ceylonese *vishnou* agree in this respect more with the Javanese *pallida*. The hairs of the latter may cause an unpleasant skin itching to many persons.

Pupation takes place in a peculiar cocoon, attached to some twig and the like. Its colour is dark camel brown, sometimes dark vinaceous, its texture like felt, mixed with the hairs of the caterpillar. Both ends of the cocoon are more or less prominent so that it becomes saddle shaped. The pupa is of a light brownish coloration, rather smooth and shining, both ends are blunt, rounded, without prominent structures.

The caterpillars are often numerous and live semi-gregariously on a number of food plants which can be listed as follows, alphabetically:

1. *Aleurites moluccana*. I found an egg cluster, probably of *Tr. brahma*, at Tjisurupan, Garut, 8. 1919; not yet published.

2. *Barringtonia* sp. (*spicata?*). The late Mr. F. VERBEEK reared a number of caterpillars in C. Java from this food plant, they yielded *Tr. krishna* (see p. 117 [15]). Specimens in Museum Buitenzorg and Institute for Plant Diseases, Buitenzorg. Unpublished.

3. *Eucalyptus citriodora*. Messrs. BLIJRDORP and TJOA TJIENG MO reared several caterpillars from the surroundings of Buitenzorg, Institute for Plant Diseases. Unpublished.

4. *Eugenia* sp. div. One of the commonest foodplants as well for *vishnou* as for *pallida*, and probably for other species.
5. *Geranium*. Recorded as a food plant for *Tr. vishnou*, from the Eastern Himalaya slopes, by MAXWELL-LEROY 1909: 498.
6. *Lagerströmia floribunda*. *Tr. pallida* in Java, sec. DUP. & SCHEEPM. 1936: 162.
7. *Melaleuca alternifolia* and *M. leucodendron*. Several specimens reared by TOXOPEUS at Buitenzorg. Verbal information, unpublished.
8. *Melastoma malabathricum*. Several specimens of *Tr. pallida* in the Institute for Plant Diseases, Buitenzorg. Also recorded by DUP. & SCHEEPM. l.c.
9. *Persea americana*. *Tr. pallida*? Cfr. DUP. & SCHEEPM. l.c.
10. *Polygonum orientale*. *Tr. vishnou*, see DUDG. 1901: 410. Eastern Himalaya slopes.
11. *Psidium guayava*. *Tr. pallida* and others? For the first time recorded by KONINGSB. 1906/07, Jaarb. Ver. Oofsteelt 8: 74.
12. *Punica granatum*. *Tr. vishnou* in India and *pallida* in Java, perhaps also other species, already mentioned by HORSF.-M. 1859: 426.
13. *Quisqualis* sp. *Tr. vishnou* in India, see BAINBR. FLETCHER 1919: 103.
14. *Ricinus communis*. *Tr. vishnou*, India; *Tr. irrorata* and *krishna* in Java, see KONINGSB. 1915, Java zool. & biol.: 294.
15. *Rhodomirtus tomentosus*. One *pallida* ♂, reared by TJOA TJIEN MO, Buitenzorg, unpublished.
16. *Rosa* sp. *Tr. vishnou*, Eastern Himalaya slopes; see BAINBR. FLETCHER l.c.
17. *Rubus* sp. Dr L. J. TOXOPEUS observed larvae of a *Trabala* in the high mountains of W. Java. Unpublished, verbal information.
18. *Schleichera trijuga*. Mr. P. BLIJRDORP reared large numbers in C. Java. Material lost. Probably *Tr. pallida*. Unpublished.
19. *Shorea robusta*. *Tr. vishnou* in India, already recorded by HORSF.-M. l.c.
20. *Terminalia catappa*. A wellknown food plant, in India for *vishnou*, in Java for *pallida*. See PIEPERS & SN. 1877: 21.
21. *Zyziphus jujuba*. Known as a food plant for *vishnou* in India.

This list shows that the *Trabala* species are rather polyphagous. As the caterpillars feed on a number of plants which produce edible fruits or seeds (*Eugenia*, *Psidium*, *Persea*, *Punica*, *Terminalia*), and as they often occur rather numerous, these *Trabala* may be regarded as minor pests. Also to forest culture they may be of some importance, living on valuable trees, such as *Barringtonia*, *Lagerstromia*, *Shorea* and *Schleichera*. The latter may even become defoliated (Mr. P. BLIJRDORP, verbal information). Already KONINGSBERGER: Med. Dep. Ldb. no. 6, 1908: 47, has stated: "the caterpillars are noxious to different plants, trees as well as shrubs" (translated).

In order to arrive at a satisfactory differentiation of the species concerned, a large number of males were dissected for microscopical examination of the genitalia. These structures (fig. 2) are ring shaped, consisting of a dorsal and a ventral part. The dorsal part is formed by the fused tergites IX and X, called *tegumen* and *uncus*, *unc*, the latter being much reduced in size. It consists of some chitinous structures, very different in the different species, but rather variable, on both sides of a median excavation of the *tegumen*. The ventral part, sternite IX, consists of a narrow *vinculum* without a noteworthy median enlargement (*saccus*). It bears the articulating *valvae*, *va*, each *valva* being divided into an upper and a lower part, the latter may be a strongly developed *harpe*. The upper

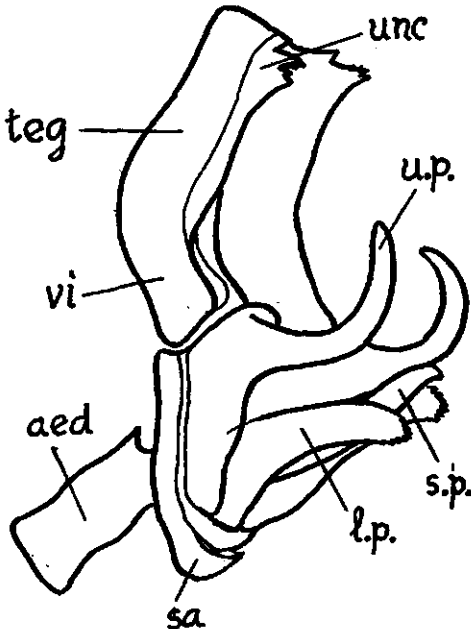


Fig. 2. Male genitalia of *Trabala pallida* Walk. unc uncus (terg. X) teg tegumen (terg. IX), vi vinculum, sa saccus, aed aedeagus, s.p. suboral projection, u.p., l.p. upper part, lower part of valva. (van de Pol del.). About $22 \times$ n.s.

part is sickle-shaped, pointed, the lower part curved only, with the tip strongly denticulate. Both are rather hairy. Between the *valvae*, the *aedeagus*, *aed*, is suspended, it is of medium length, with no exterior or interior structures, the lower margin of its orifice, however, bears a long, digitiform, suboral projection, *subor. proj.*, by which construction the *vesica* apparently protrudes dorsally, halfway or even before the middle of the *aedeagus*.

From a taxonomic point of view, only the dorsal part, called *uncus*, *unc*, is of importance; the other parts are less typical and show little or no marked differences.

Between tergite VIII and IX, a very dense and fluffy white hair mass occurs which may be a scent organ, protruding when copulation has to take place.

In the Philippine *Tr. mahatma* n.sp. the male genitalia differ strongly from the usual type, see p. 124 [22]. Also several females

were dissected. In the specimens examined the *bursa copulatrix* shows no chitinous structures at all. Only in *Tr. irrorata* MOORE, the *ostium bursae* is characterized by a certain feature described on p. 116 [14] which may be typical in this species.

II. THE SPECIES ALREADY DESCRIBED

1. *Trabala vishnou* LEF.

Pl. 4, f. 5 ♂; pl. 6, f. 1-6, 8, ♂ terg. IX-X; pl. 7, f. 1-3 id.)

1827. LEFÈVRE: Zool. Jnl. 3: 207 ♀ (*Gastropacha*): Madras
 1848. KOLLAR in VON HÜGEL: Kaschmir: 471 ♀ (*suljurea*): Masuri
 1855. WALKER: List Lep. Ins. B. M. 6: 1394 ♀ (*G. vishnou*)
 1855. Idem: 1415 ♀ (*Amydona basalis* p.p.): Ind. &c.
 1855. Idem: 1417 ♂ (*A. prasina*): Ind. &c.
 1856. Idem 7: 1785 (*Trabala*)
 1859. HORSFIELD & MOORE: Cat. Lep. Ins. &c. 2: 425 ♂♀, pl. 22, f. 3 (larva), 3b (cocoon) (*T. vishnu* (*sic!*) p.p.): Ind.
 1865. WALKER: l.c. 32: 554 ♀
 1865. MOORE: Pr. Zool. Soc. Lond. 821 ♂♀ (*mahananda*): N.E. Beng.
 1877. KIRBY: The Entom. 10: 273 (*Lasioc.*)
 1884. FORSAYETH: Trans. Ent. Soc. Lond.: 404
 1884. MOORE: Jnl. As. Soc. Beng. 53/2: 235

1890. SWINHOE: Tr. Ent. Soc. Lond.: 197
 1893. HAMPSON: Fauna Brit. Ind., Moths 1: 421, f. 293 ♂
 1895. SWINHOE: I.c.: 28
 1901. DUDGEON: Jnl. Bomb. N.H. Soc. 13: 410
 1903. ANONYMUS (DE NICEVILLE?): Ind. Mus. Notes 5: 107, pl. 2 ♂, 2a ♀, 2b (larva), 2c (cocoon)
 1909. MAXWELL-LEFROY: Ind. Ins. Life: 498 (*vishnu*), pl. 46, f. 1-6
 1911. GRÜNBERG in SEITZ 2: 166, pl. 27a ♂♀
 1913. STRAND: Arch. f. Naturg., Abt. A, Heft 3: 113 (note)
 1915. STRAND: Suppl. Ent. 4: 9: Formosa.
 1917. BAINBRIGGE FLETCHER: Proc. 2nd Ent. Meeting Pusa: 87, 246
 1920. BAINBRIGGE FLETCHER: Proc. 3rd Ent. Meeting Pusa: 103, 933
 1921. GRÜNBERG in SEITZ 10: 403 (p.p.), pl. 36e ♂♀
 1936. COLLIER: Lep. Cat. pars 73: 197 (*vishnou* part.)

A large and robust species, perhaps the largest of all *Trabala*'s. Chiefly the specimens from N.E. India (Himalaya slopes) may reach a considerable size, males up to about 63, females up to 100 mm of wing expanse. One old male from the FELDER collection, now in the Brit. Mus., even reaches 66 mm!

Distribution: Continental Asia only, from S. Thibet throughout India, Burma, Siam, Indochina, Malaya (except Southern part?), S. China, Formosa, Hainan.

The species is very variable, also structurally, forming a great many of local "ecotypes" which deserve further detailed study. For instance, such local forms occur in S. Tibet, Kangra, E. Himalayas, Canara, S. China, Formosa etc., but I am not yet prepared to give adequate descriptions and I abstain from giving names.

♂. More or less uniformly delicate green or with some whitish chiefly in median area. Pattern generally rather weak, the *sm* less undulating, *pm* rather straight and not crenulate, *dc*-spot mostly weak. Termen in both wings not or only weakly crenulate, cilia pale, apex of fore wing rounded.

♀. The topotypical female, from Madras, is bright yellow. I have a photograph of the holotypus of *sulfurea* KOLL. ♀, received by the kindness of the authorities of the Vienna Museum. It shows a rather pale specimen (perhaps faded?).

Specimens of a more brownish coloration occur, I call them f.-♀ **obscurior**.

Green females occur, but they are not common, and more restricted to the higher elevations of the E. Himalayan slopes; *cfr.* DUDGEON *l.c.* I call them f.-♀ **viridis**.

In the British Museum, I saw a series from Hoeng-Shan, 900 m, prov. of Yunan, China, *leg.* H. HÖNE, 1933. The females are very variable, several of them have the *sd*-patch entirely and obviously white. I call this female f.-♀ **mandarina**.

The male genitalia are very variable, even in specimens from the same locality. Normally, the *unc* only shows one projection on each side of median excavation, this projection is shorter or longer, broad or slender, simply pointed or blunt and with its apex denticulate. The *aed* has the *subor. proj.* longer than basal part, rather slender and slightly club-shaped, but not decidedly bent nor pointed, at least not in a series of specimens examined, from different localities.

Among the specimens from Shillong, Assam, dissected by Mr. TAMS, a very peculiar *unc* was found which may be a monstrosity. See pl. 6, f. 6. The median

excavation is only slightly developed, at both sides several chitinous teeth are projecting which give to the whole structure a crownlike appearance.

On pl. 6 and 7 a number of ♂-genitalia are figured which display the great variability of these structures, chiefly in specimens of Eastern origin. The differences are so obvious, that one may become inclined to distinguish a number of separate species. Judging from their general feature, however, I consider them altogether as *vishnou*, though a number of local populations, with structural peculiarities, may be differentiated.

The life history of this insect has often been mentioned in literature. The caterpillar is rather polyphagous and feeds on a variety of trees, shrubs and even on herbaceous plants. *Eugenia*, *Terminalia*, *Ricinus* a.o. are among the commonest food plants.

Type specimens. The original specimens, described by LEFÈBVRE, could not be traced in the British Museum. No lectotypes are indicated.

Of the local forms, only one may be described here.

1a. *Trabala vishnou singhala* n.

Pl. 6, f. 7; pl. 13, f. 4 (holotypus), ♂ terg. IX-X

♂. Less robust than the main form, the markings generally more prominent, the whitish less obvious.

♀. Coloration generally more delicate than in the main form, yellow, ochreous or green. In the female allotypus, from Peradenyia, the *dc*-spot is large, filled up with white, *sd*-patch much mixed with white scales, with *am* and *pm* rusty brown in it.

MOORE: Lep. Ceyl. 2, 1882: 146, pl. 138, f. 1a, b, 2a (♂, ♀♀ and larva) has described and figured the Ceylonese *vishnou*. His plate represents two green females. I have not yet seen a green female from this island, but it deserves a name, f. ♀ *smaragdina* n.

The male genitalia of *singhala*-holotypus have the *unc* at each side of median excavation one or two-pointed, and, therefore, resembling *pallida* WALK. It is followed by a setiferous broadening. *Subor. proj.* of *aed* distinctly club shaped.

Material and types. Holo- and allotypes, ♂ and ♀, from Peradenyia, in the Wageningen collection. In the British Museum I examined 6 ♂♂ and 13 ♀♀.

2. *Trabala pallida* WALK.

Pl. 1, f. 1-2 ♀♀; pl. 2, f. 1 larva; f. 2 ♀ on cocoon, pl. 3, f. 1 ♂; pl. 9, f. 1-6, ♂ terg. IX-X; pl. 11, f. 1, va; pl. 12, f. 1, aed

1855. WALKER: List Lep. Ins. B. M. 6: 1417 ♂ (*Amydona*): Java

1859. HORSFIELD & MOORE: Cat. Lep. Ins. &c. 2: 425 (part.), pl. 22, f. 3 (*larva*), 3a (*pupa*) (*vishnu sic!*) nec LEF.: Java.

1877. PIEPERS & SNELLEN: Tijdschr. v. Ent. 20: 21 (*Gastropacha vishnou* nec LEF.): Java.

1936. DUPONT & SCHEEPMAKER: Uit Java's vlinderleven, 162, f. 108 ♂ (*Tr. vishnou* nec LEF.): Java.

The commonest species in Java, the "*vishnou*" of most authors. A medium-sized and less robust species, chiefly in the lowlands. In the mountains, larger specimens occur. Males about 35-42, females about 62-72 mm of wing expanse.

Distribution: S. E. China; S. Malaya; Sumatra; Java; Bali; Borneo.

The species is also rather variable, but can be distinguished mostly at the first glance.

♂. Pattern mostly fairly distinct, though often faint. Forewings in median area and hindwings along anal margin more or less with whitish. *Dc*-spot in forewing mostly very weak or absent. Termen in both wings slightly crenulate, cilia tipped with brown.

♀. Resembling *vishnou*, smaller, also occurring in three main colorations:

a pale yellow or bright cadmium yellow form which I consider as the nominotypical one;

an ochreous form of different intensity: f. - ♀ *ochrea*;

a conspicuous green form: f.-♀ *herbida*, pl. 1, f. 5.

The green form is rare, I only saw a few specimens from different localities. In Java, at least, it is not confined to higher elevations.

The *sd*-patch in these three forms normally well developed, rather large, dark reddish brown, sometimes paler, but generally without whitish.

As already stated the species is common all over the lowlands of Java, up to an altitude of estimate 7-800 m. Furthermore, I saw specimens from various localities of Sumatra, others from Singapore, Bali and Borneo. There is a male in the Leiden Museum, labelled Amoy, China. It is quite a typical *pallida*, as they are common in Java, and as it is a very old specimen the locality may be somewhat doubtful.

In the mountains of Java, up to about 1800 m, a "form" occurs which may be described here as:

2a. *Trabala pallida montana* n.

Pl. 1, f. 3 ♀; pl. 3, f. 2 ♂; pl. 9, f. 7-10, ♂ terg. IX-X; pl. 11, f. 2, va, pl. 12, f. 2, aed

♂. Larger, more robust; large specimens reaching 46-52 mm wing expanse. Pattern more distinct, though *dc*-spot normally wanting. Median area in forewing broader, but less whitish. Termen of both wings more crenulate, cilia darker brown. Sometimes even the costal edge of forewing markedly brown.

♀. Measuring up to 78 mm. Coloration and pattern either very vivid yellow with blackish markings or dull ochreous with the pattern reduced and nearly wanting. *Sd*-patch present, brownish. These dark females of the mountain form, with the pattern reduced, may be called f.-♀ *brunnescens* n.

In the Leiden Museum, there is a very peculiar female of the ochreous form, from Tjinieruan, W. Java, 1750 m (leg. VAN DER WEELE), which is quite unique. It has the *sm* in both wings broadly enlarged between the nerves so that the marginal area becomes filled up with black: f.-♀ *effluens* n., pl. 1, f. 4.

Male genitalia: a large number of specimens, from many localities, were dissected. These structures are rather variable again, even in the progeny of one and the same female. The *unc* consists of a number of chitinous teeth, arranged in mostly two groups at both sides of the median excavation. These groups are rather variable in size and shape. Some of these teeth may be more prominent

than others. In one specimen from Belawan-Deli, the excavation has an unpaired, median tooth, with the apex probably broken off, see pl. 13, f. 1. The *subor. proj.* of *aed.* is long, slender and digitiform. In *pallida montana* the male genitalia are the same, but a little more robust.

Material and types. A large number of specimens were examined from many localities; in the British Museum were 6 males from Java, bred or captured by HORSFIELD, more than a century ago. Among them, WALKER'S (lecto-)holotypus must be designated, and a bright yellow female, belonging to the same series, must be considered as a (lecto-) allotypus. The holotypus of f.-♀ *ochrea*, from Semarang, C. Java, is in the Wageningen coll., as well as the holotypus of f.-♀ *herbida*, from Gunong Pantjar, near Buitenzorg (leg. DUPONT). Unfortunately, this specimen began to fade already before and during the war, and became completely discoloured during the last phase of the war, having been exposed to very unfavourable conditions. The holotypus of *montana* in coll. Wageningen. The unique holotypus of f.-♀ *effluens* in the Leiden Museum.

3. *Trabala irrorata* MOORE

Pl. 1, f. 6 ♀, 7 ♀; pl. 3, f. 4 ♂; pl. 10, f. 1 ♂ terg. IX-X; f. 2 id.; pl. 11, f. 4, va; pl. 12, f. 4, aed

1884. MOORE: Trans. Entom. Soc. Lond.: 375 ♀: Java

1884. MOORE: Journ. As. Soc. Beng. 58/2: 205 ♀: Mergui

1886. MOORE: Journ. Linn. Soc. Zool. 21: 55 ♀: Tavoy

1935. TAMS: Mem. Mus. Roy. H. N. Belg., h.s. 4/12: 44 ♀, pl. 4, f. 2 ♀: Lac de Toba, Sum.

Until now, the species remained unrecognized. MOORE had no male, and his description of the female, though accurate and careful, is not sufficient to identify this species with certainty. Therefore, this name became attached, at random, to quite different species by subsequent authors. Unfortunately, MOORE published his diagnosis twice in the same year; one of these refers to a Java female, the other is based on a female from Mergui. I cannot decide which publication appeared earlier in this year, but as only the female from Java, now in the British Museum, is accessible for us, I take this specimen for the (lecto-) holotypus. With the aid of this female I succeeded tracing more specimens including the correct male.

Distribution: I examined a rather large number of specimens from Sumatra, Billiton, Java and Borneo. One typical ♀ from the U.S. Nat. Museum bears the label: Perak. Mal. W. DOHERTY 1887. MOORE, 1886, mentions it from Siam.

In Java it is found in the lowlands and in the mountains up to 1200 m. It is not rare, though much less common than *pallida*. Life history unknown, but specimens of which ♂ and ♀ are in my possession, were bred by Mrs. WALSH in 1917 at Sukabumi.

♂. A large and robust species, measuring 46-55 mm. Mostly easily recognizable. Uniformly green, *sm* in forewing very weak or wanting, *pm* prominent, narrow as a line or broadened and somewhat dash-like, straight, not serrate, its costal origin more approached to apex and not or only very little bent inwards; *sd*-spot wanting or very weak. *Am* also very weak. In hind wing *pm* straight, not curved.

Termen in both wings hardly or not crenulate, cilia pale, only very slightly tipped with brown.

♀. Large, wing expanse up to 88 mm. Ground colour from pale apricot yellow to cadmium yellow. I saw no ochreous and no green females. Markings mostly weak, *pm* slightly serrate, beginning rather straight at costa. *Dc*-spot mostly prominent, dark brown or black, but with a white centre. *Sd*-patch entirely wanting or slightly indicated by an accumulation of darker scales. In some specimens a dark irroration with black scales occurs, chiefly in fore wing. The *sm*-streaks between the veins, though mostly faint, show the tendency of becoming enlarged, with whitish centres ("ocelloid"); on the underside of both wings, these whitish patches may be very obvious. Termen in both wings not or only moderately crenulate. Cilia pale, or very slightly dark tipped.

Trabala irrorata MOORE produces local populations; the extreme ones may have subspecific value. Only one of these may be described here.

3a. *Trabala irrorata simalura* n.

Pl. 1, f. 9 ♀

♂. Large, the pattern heavier, *sm* more distinct, consisting of small, dark olive brownish spots, *pm* on both wings and *am* lighter brownish green, *dc*-spot very weak.

♀. Very large, of 92 mm expanse, canary- to cadmium yellow, *sm* strongly developed, ocelloid, with big white centers, surrounded by broad borders of dark brownish scales. *Sd*-patch indicated by the same dark scales, with two whitish areas formed by the lower parts of *pm* and *am*. By these heavy markings, these females are very conspicuous.

Simalur, VAN DEN BERGH leg.

Male genitalia: Large and conspicuous, very different from the preceding species, belonging to a separate type. The median excavation between two large and prominent, sharply pointed teeth. Lateral parts of tegumen strongly broadened with prominent, rounded anterior angles, each bearing two shorter conical teeth. *Aed* long, *subor. proj.* slender and pointed, slightly undulating. See pl. 10, f. 1, 2; pl. 11, f. 4; pl. 12, f. 4.

In a male from Ambarawa, C. Java (Leiden Mus. cat. no. 21) — a locality perhaps nearest to that of MOORE's *irrorata* specimen from Java — the lateral parts of the tegumen are so strongly dilatated, that their outer border reaches or even slightly surpasses the dorsal projections. One of the two smaller chitinous teeth on this dilatation is flattened and situated not along the border but on the outer side of it, the other one is formed by the lower angle of this dilatation. In several Sumatran specimens the dilatation is also very broad, its anterior margin rather straight with both its angles pointed; median excavation broader, the projections more conical, in one specimen (no. 17 W.) from Deli the bottom of the excavation is straight. A specimen (nr. 25 W.) from Samarinda, S. E. Borneo, agrees rather well with the Deli specimen, but the teeth on the tegumen dilatations are more strongly developed. A number of specimens from N. Borneo, dissected by Mr. TAMS, show the same modifications.

On pl. 10, f. 1 and 2, we figure the terg. IX-X of a ♂ from Deli, Sum., resp. from Sukabumi W. Java. The median excavation is much broader in the Sumatra specimen.

Female genitalia. Mr TAMS dissected MOORE's type specimen and a second, identical specimen from the MOORE collection, Brit. Mus. See pl. 8, f. 1,4. The two cushionlike structures flanking the anus and considered as scent organs, are strongly developed, slightly chitinized and densely covered with short, brown spines. The *ostium bursae* is formed by a strongly chitinous ring, of which the proximal portion is characterized by a bubble-shaped structure, not seen in other *Trabala* species.

Material and types. Some dozens of specimens were examined, from various localities of the region already mentioned. It is regrettable that MOORE described two different specimens from two different localities, Java and Mergui, in two different periodicals, but in the same year. His diagnosis in both cases is verbatim the same. In 1886, he described a third female, from Tavoy, Siam, using the same diagnosis again. Of his two type specimens, I selected the Java specimen, well preserved in the Brit. Mus. as the (lecto-) holotypus; the other specimen is supposed to be in the Calcutta Museum. MOORE's Java specimen is rather small, pale yellowish, irrorated with dark scales, the entire pattern obsolete. It is probably collected (bred?) by HORSFIELD, so we may suppose, that Central Java, surroundings of Solo, is its habitat. It is logical to select as a ♂-paratypus the specimen from Ambarawa, Leiden Mus. Cat. nr. 21.

Holo- and allotypus of *Trabala irrorata simalura* in the Mus. Amsterdam. Slide of holotypus nr. 41 W.

4. *Trabala viridana* JOIC. & TALB.

Pl. 7, f. 8, ♂ terg. IX-X

1917. JOICEY & TALBOT: Ann. & Mag. N.H. (8) 20: 8 ♂, pl. 3, f. 11 ♂: N. Dutch New Guinea, Wandamman Mountains, 3-4000'.

There is only one male known, the holotypus, now in the Brit. Mus. A small specimen, correctly figured l.c., uniformly green, with *pm* in forewing strongly curved. The genitalia, as dissected and photographed by Mr. TAMS (nr. 119T) show an *unc* of the *pallida* type; the *tegumen* is rather broad, strongly tapering towards lower ends. See pl. 7, f. 8.

There is a second *Trabala* male in the Brit. Mus. bearing the label "New Guinea" only, without further indication. Dissected by Mr. TAMS (nr. 158T), the genitalia prove to belong decidedly to what is described in the following as *Tr. krishna* or even to the form from N. Borneo of this species. Therefore, the labeling may be erroneous.

The occurrence of a *Trabala* in New Guinea demonstrates that a typical Malayan faunistic element has penetrated into this Papuan region. Perhaps its occurrence is confined to one or more localities where more Malayan elements can be expected.

5. *Trabala leopoldi* TAMS

Pl. 1, f. 12 ♀; pl. 4, f. 6 ♂; pl. 11, f. 9, valva; pl. 13, f. 6-8, ♂ terg. IX-X

1879. SNELLEN: T. v. E. 22: 122 (*Gastropacha vishnou* nec LEF.): Makassar

1935. TAMS: Mém. Mus. H. N. Belg., hors série 4/2: 45 ♀, pl. 4, f. 3 ♀: S. Cel., Makassar.

1948. NIEUWENHUIS: Tijdschr. Ent. 89: 144 ♂ (*undecima* RPKE. i.l., nom. nud.): Nulion, Banggai Arch.

A large and robust species, males measuring up to 55, females up to about 100 mm expanse. As far as known, it is the only *Trabala*, inhabiting Celebes, occurring from the South (Makassar) to the North (Menado) and possibly forming slight local populations. I have seen a male from Nulion, Banggai Arch., in coll. NIEUWENHUIS, Rotterdam.

♂. Uniformly green, in the Makassar specimens *sm* weak or wanting, *pm* slightly curved, not serrate, distinct, *sd*-spot weak or nearly wanting, *am* distinct, straight. Termen in both wings slightly crenulate, cilia light brownish. A male from Bolaang Mongondow, N.-Cel. (coll. WITPEN, Amsterdam), has the markings more prominent, *sm* highly angled, *dc*-spot also nearly wanting.

♀. The specimens from Makassar vary generally from light canary yellow to dark golden yellow, the dark pattern very marked, *sm* sometimes more or less ocelloid. *Dc*-spot distinct, black, mostly with a white centre. *Sd*-patch light brownish, not very obvious. An ochreous variety of the ♀ has not yet come to my knowledge.

Among a small series, recently bred at Makassar by and received from Dr C. FRANSSEN, a very peculiar female occurs which has the ground coloration rather dark and dull olivaceous, with *sm* formed by white spots and so much contrasting, also on underside. We have to do here with the green variety which may bear the name f.♀ *olivacea* n.

The male genitalia, as well in the Southern as in the Northern form are simply built. The median excavation is very broad, with only one projection on each side which is digitiform, long, slender and pointed. *Aed* moderately long, *subor. proj.* ending with a pointed projection. See pl. 11, f. 12; pl. 13, f. 6-8.

Material and types. I examined a sufficient number of specimens from S. and N. Cel.; in the Brit. Mus. N.H. more than 40 males from Central and N. Celebes (leg. KALIS), unfortunately no female. Holotypus ♀ in the Brussels Mus.; allotypus ♂, with genital slide nr. 134 W., from Makassar, coll. Wageningen.

III. THE SPECIES NEW TO SCIENCE

a. Species from Java, Sumatra and Borneo

6. *Trabala krishna* n. sp.

Pl. 3, f. 6 ♂; pl. 7, f. 4, ♂ terg. IX-X; pl. 11, f. 6, valva; pl. 12, f. 6, *aed*.

♂. A medium sized species, the largest specimens reaching 46 mm wing expanse. The green coloration very uniform, without whitish variegation. In dried specimens this green colour more resistant to fading than for instance in *pallida*. The cross lines brownish, mostly distinct or even rather prominent, *pm* slightly curved and serrate, *dc*-spot mostly thick, obvious, blackish, more prominent than in other species. Termen of wings crenulate. Cilia mostly pale, tipped with light brownish. In Sumatran specimens the markings may be very prominent.

♀. Very similar to *irrorata* MOORE, of the same yellowish ground colour, more or less irrorated with dark scales, the cross lines dark, more or less prominent, *sm* often ocelloid and with whitish, *sd*-patch wanting or weak, interspersed with whitish. Termen in both wings more or less crenulate, chiefly in hindwing; by this character these females may be separated from those of *irrorata* MOORE.

From Java, I have only seen yellow females. The Institute of Plant Diseases,

Buitenzorg, sent me two greenish females, which I can only attribute to this species. One of them is labelled: Djambi, 1929, VII-IX, C. H. TER LAAG, the other one: Samarinda, S.E. Borneo, X. 39, WALSH. The former is of a yellowish green coloration, *pm* strongly serrate, *dc*-spot rather small, *sd*-patch very obsolete, *sm* ocelloid, whitish on both wings. Underside, chiefly on hindwing, heavily suffused with brownish. The other specimen has the wings a little narrower, the coloration more yellowish with a greenish tinge, the markings heavy, but *sm* not ocelloid, a dark brown *sd*-patch more distinct. Some dark and coarse irroration along outer margin of both wings, chiefly in hind wing. Underside not suffused with dark brown.

I consider the greenish female from Djambi (C. Sum.) as the holotypus of a new form, f. ♀ *hemichlora* n.

The male genitalia of *Tr. krishna* are rather characteristic, though variable. See pl. 7, f. 4 terg. IX-X; pl. 11, f. 6 *va*; pl. 12, f. 6 *aed*. The *unc* has two projections on each side of median excavation, normally of uneven length, the outer one being elongated, digitiform, the inner one reduced and very short or even reduced to a rugosity only. I saw, however, in some exceptional cases both processes about equally long. Furthermore I have examined specimens from Sum. and Borneo, which have the outer projection broadened at base, with a tooth on its outer side. Median excavation between inner processus, often very shallow. Both parts of *va* short and stout, *aed* obviously short and stout, weak; *subor. proj.* short and curved.

Tr. krishna is not so common in Java as *pallida*, but it is not rare. It has been sometimes identified as *irrorata* MOORE by several authors.

The species was bred by Mr W. C. VAN HEURN, at Buitenzorg, from *Ricinus communis*, and by the late Mr A. TH. H. VERBEEK at Seneng, Semarang, C. Java, from *Barringtonia spicata* ("putat"). A specimen in the Leiden Museum bears the label "bidara upas"; this is the native name of a plant, *Zyziphus jujuba*. I had one ♀ bred from *Psidium guayava*, Buitenzorg. The Institute for Plant Diseases, Buitenzorg, sent one male, bred from *Melastoma malabathricum*. Further details about the caterpillar and its life history are not available.

Distribution: The species is known to me from lower elevations only, I never saw a specimen from the higher mountains. It occurs furthermore in Billiton, Malaya, Sum. and Born. The Brit. Mus. has 1 ♂ and 1 ♀, labelled N. Guin., without further indication. The ♂ (preparation 158 TAMS) shows the outer digitiform processus of *unc* much enlarged in its basal half, with a distinct, lateral tooth, as I saw it chiefly in specimens from N. Born. Possibly the label is erroneous. Furthermore, the Brit. Museum has one male from Mergui, with the genitalia rather typical for *krishna* (168 TAMS). It is not quite unthinkable, therefore, that MOORE's *irrorata* ♀ from Mergui may belong to this species.

Material and types. I examined a rather large number of specimens, in both sexes, from various localities, as already mentioned. As a holotypus ♂ I select a specimen from Seneng, Semarang (leg. VERBEEK), ex Institute for Plant Diseases, Buitenzorg, as an allotypus ♀ a specimen from "W.-Java" (leg. WALSH), both now in the Wageningen collection. The holotypus of f. ♀ *hemichlora* from Djambi, Central Sumatra, now also at Wageningen.

7. *Trabala brahma* n. sp.

Pl. 1, f. 8 ♀; pl. 3, f. 5 ♂; pl. 7, f. 5, ♂ terg. IX-X; pl. 10, f. 3 id.; pl. 11, f. 5, valva; pl. 12, f. 5, aed.; pl. 13, f. 9, ♂ terg. IX-X

♂. Comes very near to the preceding species. Uniformly green, without whitish, dark cross lines more delicate. *Sm* blackish, *pm* brownish, slightly curved and serrate; *dc*-spot small, black or brownish, sometimes more or less obsolete.

♀. Only known in the green form, this green is very bright in fresh specimens, the cross lines are clear, black, *dc*-spot mostly thick, with a white centre; *sd*-patch wanting or indicated by some dark scales only.

Male genitalia. They bear a great resemblance to those of *Tr. krishna*, chiefly the *unc* with its two projections of unequal length is practically the same, though the inner processus may be more prominent. There is, however, a distinct difference concerning the shape of *aed*; in *brahma* it is long and slender, with the *subor. proj.* slightly curved and pointed, whereas in *krishna* it is obviously short and weak, see pl. 12, f. 5.

Distribution: Only known from the higher mountains of Java, between about 1200–1800 m, where it is not rare. Furthermore from Bali, Gilgit and Mondok-Tumpang (leg. KALIS). I have not seen specimens from Sumatra or Borneo.

Material and types. I examined about 30 ♂♂ and 10 ♀♀ from the mountains of W., Central- and E.-Java. In the Brit. Mus. 38 ♂♂ from the Bali localities just mentioned. As type-specimens I select a ♂ from Mt. Gede, W.-Java, as a holotypus, and a ♀ from Tjisurupan, Garut, W.-Java, allotypus, both in the collection Wageningen.

8. *Trabala ganesha* n. sp.

Pl. 1, f. 10 ♀; pl. 3, f. 3 ♂; pl. 9, f. 11, 12, ♂ terg. IX-X; pl. 11, f. 3, va; pl. 12, f. 3, aed.

♂. A rather large and conspicuous species, males measuring up to 50 mm expanse. Easily recognizable by the obvious whitish variegation on both wings. In fore wing chiefly the median area is greatly filled up with white, along termen the green colour may also be replaced more or less by whitish. Much white also on hind wing, chiefly on inner side of *pm* and in anal area. The *pm* in both wings very oblique and straight, in forewing originating from near apex. *Sm* in both wings weak, less undulating. Termen less crenulate, cilia pale, only very slightly dark tipped. Underside light green, with the straight *pm* in both wings very obvious.

♀. Fresh specimens light green, fading into dirty yellowish in older ones. Measuring 70–80 mm. Pattern very distinct, *dc*-spot large, a very large and obvious *sd*-patch, a corresponding dark patch also in anal area of hind wing. The coloration of these markings is chocolate brown. Forewing costa brown, termen strongly crenulate in both wings, cilia dark brown. Underside with the cross lines very prominent, sometimes more or less suffused with brown, chiefly in hind wing.

It is not absolutely certain that both sexes as described above belong to each other, as they are never bred, but there is no possibility to ascribe the females concerned to another species.

The male genitalia distinguish *Tr. ganessa* also easily from other species. The median excavation is shallow or rather wanting, the opposite hindmargin of *teg* strongly broadened. On each side of median excavation a small rugosity, more or less obsolete and sometimes wanting, followed by a very strong chitinous projection, somewhat tooth shaped and more or less asymmetrical, with its apex denticulate. The *aed* has the basal part extremely short, the *subor. proj.* slightly curved and thickened, with its apex blunt.

Distribution: Java, Borneo, Sumatra, Singapore, Malaya. In Java the species is not common, it occurs from the lowlands up to an elevation of more than 1000 m (Perbawatee, W.-Java; Idjen-Plains, E.-Java). Its life history is unknown.

Material and types. I examined about 30 ♂♂ and 15 ♀♀ from the localities mentioned. As a holotypus I take an old ♂ from Perbawatee, W.-Java, genitalia slide nr 22 in the Wageningen collection, as allotypus ♀ a specimen from Situ Gunung, 1000 m; W.-Java, leg. BARTELS, ex Zoological Museum Buitenzorg, now also in the Wageningen collection.

9. *Trabala arjuna* n. sp.

Pl. 3, f. 7 ♂; pl. 10, f. 7, ♂ terg. IX-X; pl. 11, f. 7, va

♂. A robust species, measuring 51–53 mm expanse. The antennae obviously thick, wings broad, apex and termen of fore wing rounded. Ground colour uniformly green, without white, not even along anal margin of hindwing, abdomen and underside of body. The markings variable, in one specimen (holotypus, slide nr. 10 W.) very weak, in the two other ones more distinct, *sm* undulating, blackish, *pm* straight, weak, light brownish *dc*-spot small, black. Termen not crenulate, cilia pale, hardly or not dark tipped. Underside with the markings absent or very weak, only *pm* in hindwing distinct, strongly curved.

♀. The only specimen I can ascribe to this species, is of a uniform yellowish green coloration, *sm* very distinct, strongly undulating, blackish, with its beginning near apex in forewing strongly bent inwards. *Pm* very weak, brownish, *dc*-spot weak, no *sd*-patch. Underside dull, the markings obsolete, hindwing more or less suffused with dark scales. Expanse 70 mm.

Male genitalia. Only one specimen examined. *Unc* consisting of two pairs of chitinous teeth, of equal length, but of moderate size. The outer one hairy, the inner one smooth, sharply pointed and bent outwards. See pl. 10, f. 7, pl. 11, f. 7.

Distribution: Only known from the highest mountains in W.-Java.

Material and types. There are only three males from Patuhawatee, 1750 m, W.-Java, leg. TOXOPEUS, 1936, including holotypus. The only female I can attribute to this species, is from Mt. Papandajan near Garut, W.-Java, leg. DIAKONOFF, 1927, I received it from Dr TOXOPEUS. These four specimens, the only known material, in the Wageningen collection.

10. *Trabala shiva* n. sp.

Pl. 3, f. 8 ♂; pl. 10, f. 8, ♂ terg. IX-X; pl. 11, f. 8, va; pl. 12, f. 7, aed.

♂. A rather small species, measuring up to 44 mm. Easily recognizable. The

green ground colour much variegated with white, more than in all the other species here described. In fore wing, *sm* obsolete, formed by more or less indistinct interneural spots. These spots, at their inner side, bordered with whitish. *Pm* very slightly curved, but rather perpendicular, by having its origin rather remote from apex; at its inner side, in median area, with much white. The *dc*-spot very small or simply indicated by a small dimple, devoid of scales; by this structure the species may be also separated from its allies. *Am* also rather distinct, base of fore wing whitish again.

In hind wing *am* and *pm* weakly indicated by traces only, the entire wing surface, except marginal area, with much white, chiefly along anal margin. Underside with the pattern weak, and also with much white. Termen in both wings, but chiefly in hind wing, distinctly crenulate, cilia dark brown.

The highly developed whitish variegation, the peculiar structure of *dc*-spot, the crenulate termen with dark cilia, make the species recognizable at the first sight.

♀. unknown; there is a slight possibility, however, that *Trabala indra* n. sp. may belong to this species; see p. 123 [21].

Male genitalia: examined in three specimens, from Goalpara, W.-Java, S.-E.-Borneo and Tandjong Amuntai, S.-E.-Borneo also (slides nrs 12, 26 and 47 W. respectively). They agree remarkably well. *Teg* globose, not easy to spread plainly. *Unc* much reduced, median excavation semicircular or somewhat flattened, with a broad rugosity at each side, bearing a small, sharp tooth on its inner edge or without this structure. The *aed* has the *subor. proj.* strongly clubshaped and hairy. By these structural features, the species cannot be confounded with other ones. See pl. 10, f. 8, pl. 11, f. 8, pl. 12, f. 7.

Distribution: *Tr. shiva* is known from Java, Sumatra and Borneo. It is apparently rare.

Material and types. The Wageningen collection has three males, two of them from Goalpara, W.-Java (leg. WALSH), and one from Kariorang, S.-E.-Borneo (leg. QU. DE QUARLES). The Leiden Museum has 6 males from Puspo-Tengger, E. J.; Batavia; Wai Lima, S.-Sumatra (leg. KARNY) and Deli, Sumatra, measuring 39-44 mm. Judging from these localities the species occurs in the lowlands as well as in the mountains. The Museum Amsterdam has one ♂ only, from Tandjong Amuntai, S.-E.-Borneo. As a holotypus I select one ♂ from Goalpara, in coll. Wageningen. The slide, 8a, unfortunately was lost by direct war action.

b. Species up to the present not known from Java

11. *Trabala gautama* n. sp.

Pl. 4, f. 1 ♂; pl. 8, f. 2 ♂ terg. IX-X

♂. Characterized by the very obvious, dark brown markings. Even the veins decidedly indicated by brown scales. Termen in fore wing not, in hind wing only very slightly crenulate. Cilia pale. *Sm* in both wings rather obvious, strongly undulate. *Pm* strongly developed, straight in both wings. *Dc*-spot obsolete. *Am* distinct. Underside with the pattern also very obvious, *pm* in hind wing slightly more curved, but rather coincident with *pm* on upperside. Expanse 54 mm.

♀. Unknown.

Male genitalia. In the only known specimen the *unc* very peculiar, consisting of a heavy chitinized and broad triangular plate on each side of median excavation. See pl. 8, f. 2 (117 T.); other parts not examined.

Distribution & c. There is only one male known, from Lebong Tandai, Benkulen, S. Sum. (leg. C. J. BROOKS, 22-12-1921), in the British Museum. It is the holotypus.

12. *Trabala garuda* n. sp.

Pl. 5, f. 1 ♀; pl. 8, f. 3, ♂ terg. IX-X

♂. A large species, measuring 40-52 mm. Antennae thick, with long pectinations. *Sm* in both wings less undulating, faint. *Pm* very distinct, straight, oblique, on its inner side whitish. *Sd*-spot small, but distinct, black. Pattern in hind wing very weak, hardly discernible. Termen in both wings not crenulate, cilia pale. Underside very pale, pattern chiefly formed by the curved *pm* in hind wing, with very slight interneural dots in hind wing, representing *sm*. The male somewhat resembles the *irrorata* ♂, but its coloration differs by the whitish in median area.

♀. The female, pl. 5, f. 1, which I attribute to this species, though not without great hesitation, is dull yellowish green. *Sm* clear, consisting of small interneural spots of a purplish brown coloration. *Pm* straight, not serrate, *dc*-spot distinct with a white center. *Am* absent. *Sd*-patch distinctly purplish brown. Termen not crenulate, cilia pale. Underside with only the *sm*-spots distinct, somewhat arrow-pointed. All other markings wanting. Coloration slightly darkening towards base. 70-77 mm expanse.

Male genitalia. Pl. 8, f. 3. Median excavation slight, on each side with a strong, chitinous and pointed projection, asymmetrical in one specimen (slide 135 W.), in another specimen (156 T.) this projection is strongly bifid. In the slide 135 W the *va* has the upper part less strongly curved, the lower part distally somewhat broadened and curved, with its inner side strongly denticulate.

Distribution, material and types. Several males in the British Museum ex coll. JOICEY, labelled: North Korintji Valley, S.W. Sumatra, 5000, Sept.-Oct. 21, C. F. PRATT. One ♂ (slide 135, Wageningen) labelled: 7.22, Slopes of Mt. Korintji, S.W. Sumatra 7300'. Aug.-Sept. 1921. C., F. & J. PRATT. Another male in the British Museum, probably belonging to the same species is labelled: 7.22. Barisan Range, Western slopes, S.W. Sumatra, 2500', Oct.-Nov. 1921. C., F. & J. PRATT. The entire series in the British Museum, also containing the males of the following *Tr. hantu*, consists of 25 males.

The female described is represented by two specimens in the British Museum labelled 7.22. Slopes of Mt. Korintji, S.W. Sumatra, 7300', Sept. 1921. C., F. & J. PRATT.

Holo- and allotypus have been selected from this material.

13. *Trabala hantu* n. sp.

Pl. 5, f. 2♀; pl. 13, f. 5, ♂ terg. IX-X

♂. This male is extremely similar to the preceding one, so that it is practically indistinguishable from it. It had also been caught with the same series and

in the same locality. Perhaps the antennae are a little heavier, the *pm* more linear, median area less whitish, all other markings very weak, on underside practically absent.

♀ ?. There is one peculiar female in the British Museum also belonging to the same series, which I associate with this species, but I do so with the greatest possible reserve. The coloration is decidedly brown, without traces of yellowish or green. *Sm* obsolete, marginal area slightly darkened, *pm* distinct, straight, oblique; *dc*-spot obsolete, *am* weak, *sd*-patch absent. Termen hardly crenulate, cilia of the ground colour. Underside lighter, markings faint, *pm* in hindwing strongly curved, not coincident with *pm* on upperside. See pl. 5, f. 2.

Male genitalia. Very different from those of the preceding species, proving that this species belongs to the *irrorata*-group. They differ from Sumatran *irrorata* by being less robust, the median excavation being narrower, with the accompanying processus shorter and more blunt, and chiefly by the much less pronounced lateral dilatation of the *unc*, which bears one wart-like projection only (slide 124 W.). See pl. 11, f. 9.

Distribution, material and types. Only known from Mt. Korintji, collected together with the foregoing species; ex coll. JOICEY, now in the British Museum. A ♂ holotypus has been selected from this material. The only ♀, here described with a question mark as belonging to this species, being possibly the allotypus, also in the British Museum.

14. *Trabala indra* n. sp.

Pl. 1, f. 11 ♀

♂. Unknown.

♀. A characteristic and apparently less variable insect which I can pick out immediately, even from large numbers of other females. Medium sized to small, the fore wing somewhat narrow, with the apex rather pointed and the termen straight and oblique. The ground colour, preserved in the two Leiden females only, may be compared with "wax yellow" or "strontian yellow" (RIDGWAY pl. 16), but it is extremely liable to fading so that the specimens ultimately become quite pale.¹⁾ The markings are very faint, not dark, but chiefly whitish, in faded specimens practically invisible. The termen, chiefly in hindwing, strongly crenulate, with the cilia dark. Underside with the markings perhaps somewhat more prominent, chiefly in hindwing, and whitish. Here the white *sm*-patches in apex are obvious.

Distribution, material and types. The Wageningen collection has one female labelled "Sumatra" only, perhaps from Medan-Deli. It measures 71 mm, holotypus. In the Leiden Museum there are two females, both from Deli, 62 and 69 mm. In the British Museum I traced one female from Deli (leg. Dr MARTIN, ex coll. OBERTHUR), 74 mm, showing still the greenish yellow ground colour, but practically without markings. Curiously enough there is a second female in this Museum, badly faded, from Baram District, Sarawak, leg. CHAS. HOSE, undoubtedly belonging to the same species, so that this insect is known from N. E. Sumatra and N.-Borneo

¹⁾ These specimens withstood the last phase of the war at Wageningen and here they became completely faded.

The male is either unknown or it may be *Tr. shiva*, see p. 120 [18]. Unfortunately, I have not yet seen an *indra* ♀ from Java, whereas the *shiva* ♂♂, known to me, are partially from Java. If I had an *indra* ♀ from Java, I should not hesitate to unite both species.

c. Species from the Philippines

The Philippines form a rather large and complicated Archipelago, consisting of many separate islands of very different size. It is a well known fact that the insect fauna of this region is a highly specialized one, giving rise to many subspecies or even to endemic species. Concerning the genus *Trabala*, it is represented in this Archipelago by several species. Already SEMPER, 1896-1902: Schmett. Phil. Ins. 2, Nachtf.: 455, records one pair of a *Trabala*, which he calls *vishnu* (*sic!*), from Mindoro, Mindanao, saying that the attributes them to this "rather variable" species, though they do not exactly fit the description. The true *vishnou* is not yet found in this region. Unfortunately, the material available is very scanty, I could only examine a few specimens in the British Museum and I had 4 ♂♂ and 3 ♀♀ from the U.S. Nat. Museum, Washington, D.C. I could dissect the specimens from the U.S. Museum, the slides were returned to this Museum. The specimens may be separated as follows.

15. *Trabala mahatma* n. sp.

Pl. 4, f. 8 ♂; pl. 14, f. 1, ♂ terg. VIII; f. 3, ♂ terg. IX-X; f. 2, aed.; f. 13, va

♂. Rather large, exp. 55 mm, green with much whitish in median area, *sm* obsolete, *pm* markedly distinct, not serrate, straight but rather oblique, originating from near apex of forewing. *Dc*-spot obsolete or wanting, *am* weak. In hindwing *sm* weak, *pm* distinct, straight. Tergites in both wings not crenulate, cilia pale, hardly dark tipped. Underside with *sm* in both wings slightly more visible, *pm* in forewing weakly indicated only, in hindwing distinct, slightly curved. Forewing much whitish.

At the first sight this male resembles *Tr. irrorata*, but it is more whitish. I had a second specimen from the U.S. Nat. Museum, Washington, paratypus, labelled Surigao, Mindanao. It is smaller, measuring only 48 mm, the white variegation is less obvious, otherwise it agrees well with the holotypus.

♀. Unknown.

Male genitalia. Very different from all other species examined, they represent a highly specialized typus. Tergite VIII strongly developed, elongated, it bears near its posterior margin two very obvious, prong-like arms, strongly curved distad. The genitalia themselves are probably hidden under this tergite, when at rest, they are rather weak, the tegumen is narrow, it bears no *unc*, but has on each side a triangular dilation. *Va* rather normal; *aed* not especially examined. See pl. 7, f. 6, 7.

Of the paratypus, the ♂ genitalia were mounted in Canada balsam (nr. 136 W.). They are the same as in the holotypus. The distal border of tergite VIII is membranaceous and, therefore, not sharply defined, it bears the very dense and fluffy pilosity which occurs here in all *Trabala* ♂♂. The two prong-like arms are strongly developed and heavily chitinized. The tegumen or tergite IX is rather v-shaped, there are no structures which can be regarded as an uncus. The lower part of tergite IX bears an obvious, triangular plate at each side. The

lower part of the *va* is not so coarsely denticulate as in other species. The *aed* is slightly bent or undulating, its *sub. proj.* is markedly broadened and club shaped. See pl. 14, f. 1; f. 3; f. 2; f. 13.

Future authors may become inclined to erect a new genus or at least a new subgenus, on a *Trabala* species with such a highly differentiated genital structure. On the other hand, however, it may be an indication that the male genitalia in *Lepidoptera*, however valuable they may be for the discrimination of so-called difficult species, are not always suitable for generic classification.

Material &c. Only two males of this interesting species are known, one in the British Museum, labelled Kolambugan, Mindanao, Phil.; Aug.-Sept. 1922 (Genitalia nr. 111, diss. TAMS); holotypus. The other one, as described above, in the U.S. Nat. Museum, Washington, D.C., from Surigao, Mindanao. Slide nr. 136 W.

16. *Trabala subadra* n. sp.

Pl. 4, f. 7 ♂, pl. 8, f. 6, ♂ terg. IX-X

♂. Medium sized, about 49–54 mm expanse. The specimens, though much faded, show the median area somewhat whitish. *Sm* rather weak or practically wanting, *pm* in forewing very distinct, rather broad, light brownish, straight, not serrate, from near apex, in hindwing obsolete. *Dc*-spot obvious, thick, dark brownish. *Am* indistinct or wanting. Edge of costa in forewing brown, termen in both wings slightly crenulate only, cilia dark tipped. Underside practically without markings, cilia darker.

♀. Unknown.

Male genitalia. Examined in 3 specimens (TAMS nr. 119, 126, ROEPKE nr. 125 W.), which show practically the same structure. *Unc* very weak, with a small and shallow median excavation, bordered by a small and inconspicuous lateral projection, not strongly chitinized. The lateral parts of *teg* are strongly dilatated, resembling the structure in *Tr. irrorata*, to which group this species may belong. *Aed* with the basal portion very short, *subor. proj.* long and slender, but with the apex blunt. See pl. 8, f. 6.

Material &c. There are 14 ♂♂ of this species in the British Museum, labelled Haight's Place, Panai, Benguet, Luzon, 7000', 8-11-1912. A. E. WILEMAN. From this series the holotypus has been selected.

17. *Trabala sudara* n. sp.

Pl. 4, f. 9 ♂; pl. 8, f. 5, ♂ terg. IX-X

♂. Apex and termen in forewing slightly rounded, termen in both wings not crenulate, cilia pale. Markings distinct, of a light reddish brown colour. *Sm* undulating, *pm* strongly bent inwards near inner margin. *Dc*-spot wanting, *am* distinct. Underside with the pattern less distinct, *pm* in fore wing faint, in hind wing rather angled in cell 2.

♀. Unknown.

Male genitalia. Mr. TAMS sent me a photograph of the tegumen and uncus (nr. 114), here the median excavation is wanting, and the *unc* is represented by two prominent points only, one at each side. See pl. 8, f. 5.

Material &c. There is 1 ♂ in the British Museum, labelled Kolambugan, Lanao plains, Mindanao, 19 May 1914 (A. E. WILEMAN). Holotypus. There is a second ♂ in the British Museum under the same label, dated 25 May 1914, which may be the same. It measures also 42 mm and it has a distinct *dc*-spot in fore-wing. Mr. TAMS had it numbered 136.

18. *Trabala rama* n. sp.

Pl. 4, f. 10 ♂; pl. 14, f. 6, ♂ terg. IX-X; f. 8, aed; f. 10, va

♂. Resembling the preceding species as to its general features. Termen, chiefly in hind wing, distinctly crenulate, cilia pale, brown tipped. Exp. 47 mm.

♀. Unknown.

Male genitalia. A slide (nr. 137 W.) of this specimen shows the *unc* formed by two prominent projections, whereas the median excavation is hardly present. Both projections have the tips two-pointed. The lower part of *va* moderately denticulate at its tip, with one special tooth more prominent. *Aed* slightly bent, rather thick, suboral projection markedly pointed. See pl. 14, f. 6, 8, 10.

Material &c. Only one ♂, holotypus, U.S. Nat. Mus. Washington., numbered Tr. 137, from Surigao, Mindanao, Aug., B.P. CLARK donor.

19. *Trabala durga* n. sp.

Pl. 4, f. 2 ♂; pl. 14, f. 4, ♂ terg. IX-X, f. 5, aed; f. 11 va

♂. Differs from the preceding species by its pattern. *Sm* weak, *pm* oblique but straight, very prominent, *dc*-spot as a very faint speckle near *am*, the latter strongly angled. In hind wing, *sm* practically wanting, *pm* obvious, rather straight. Termen in both wings hardly crenulate, cilia pale. Underside only with *pm* very distinct in both wings, in hind wing it is strongly curved. Expanse 47 mm.

♀. Unknown.

Material &c. Only one ♂, holotypus, U.S. Nat. Mus. Washington, the same labelling as the preceding one.

Male genitalia. Slide nr. 138 W. *Unc* of the same type as nr. 114 (TAMS) and 137 W., but the two projections, representing *unc*, shorter than in 137 and not two-pointed. Lower part of *va* heavily denticulate, the teeth in several rows. *Aed* obviously more slender than in 137, chiefly in *sub. proj.*, the latter with its apex blunt, not acute. See pl. 14, f. 4, 5, 11.

20. *Trabala mahadeva* n. sp.

Pl. 4, f. 3 ♂; pl. 14, f. 7, ♂ terg. IX-X; f. 9, aed.; f. 12, va

♂. Differing from the three preceding species by its pattern, which is much more

distinct and brownish. *Sm* in both wings well developed, *pm* rather straight, but in fore wing near costa slightly bent inwards. *Dc*-spot wanting, *am* very distinct, somewhat angled near costa. Termen hardly crenulate, cilia rather pale. Underside with *pm* very distinct, in hind wing strongly curved. Expanse 46 mm.

♀. Unknown.

Material &c. Only one ♂, holotypus, U.S. Nat. Mus. Washington, same labeling as in the preceding species.

Male genitalia. With the same two-pronged *unc* as in the preceding three species, but the prongs with a projection at their inner side. Lower part of *va* coarsely denticulate. *Aed* rather slender, apex of *subor. proj.* rather blunt. Slide nr. 139 W. See pl. 14, f. 7, 9, 12.

The Females

The 3 ♀♀ in the U.S. Nat. Mus. collection cannot be ascribed to one or more of the preceding males, though they may belong to them. Therefore, they are characterized here, but I must abstain from giving names.

Trabala sp. ♀

Two specimens, certainly conspecific. The smaller one, pl. 5, f. 3, expanse 79 mm, is of a light dull yellowish brown coloration, the submarginal area in both wings, bordered by the strongly undulating *sm*, is entirely filled up by a darker brown. This pattern gives the insect a peculiar aspect, something resembling the *effluens*-form of *Tr. pallida montana*, see p. 113 [11] and pl. pl. 1, f. 4. *Pm* in both wings strongly dentate; *dc*-spot large, but less prominent; *am* strongly curved, termen crenulate, cilia dark. Underside the same, but the cross lines faint. Locality: Surigao, Mindanao, P. I. Nov. B. P. CLARK donor.

The second specimen was pinned only, the wings in the normal resting position. The ground colour was a vivid emerald green, the markings are rather the same, in hind wing a slight indication of a darker *dc*-spot. I put this female in the relaxing jar, and in less than 24 hours the beautiful green had turned into a light yellowish brown. The underside is more variegated than in the first specimen. It is larger and measures 83 mm. Locality: Mt. Makiling, Luzon; leg. CH. F. BAKER.

Trabala sp. ♀

Pl. 5, f. 4

Expanse 70 mm. Ground colour uniformly dull yellowish brown. *Sm* in both wings formed by a slightly undulating row of white spots, most distinct in apex of both wings. *Pm* slightly darker greyish, very faint and hardly dentate, near inner margin with a trace of white, in hind wing obsolete. *Dc*-spot white, with a dark border. *Am* indicated by some white near inner margin. Underside with the cross lines obsolete or wanting, but the white *sm*-patches distinct and conspicuous. Locality: Surigao, Mindanao P. I., Aug., B. P. CLARK donor.

IV. SUMMARY AND CONCLUSIONS

1. The present investigation concerning the genus *Trabala* in S. E. Asia, is based on an extensive material and was achieved in cooperation with the British Museum Nat. Hist., London. A review is given of the literature, the bionomics &c. of the Indomalayan species. The male genitalia are described in extenso for the first time and are used as a base for discriminating the species concerned which otherwise can hardly be differentiated. Even with the aid of these structures, a correct identification may be sometimes difficult.
2. Twenty species of *Trabala* are treated in the present paper, only five of them being already known to science, fifteen being new. Several forms of the female and local races are described. The species have a wide range from India to Formosa, throughout the Malay Archipelago, the Philippines and Northern New Guinea. From the Lesser Sunda Isles East of Bali, and from the Moluccos, East of Celebes, they are not yet known.
3. The oldest species *Trabala vishnou* LEF. is confined to the Asiatic Continent only. All identifications of *Trabala*'s from other regions, as *vishnou*, therefore, are erroneous. The ochreous female is described as f.-♀ *obscurior* n., the green one as f.-♀ *viridis* n., the Ceylon race as *vishnou singhala* n. with the green female as f.-♀ *smaragdina* n.
4. The status of *Trabala irrorata* MOORE, until now unrecognizable, is elucidated and its legitimate male established with certainty. It occurs in the Larger Sunda Isles, Malaya, Mergui and is reported from Siam. A race from the island of Simalur is introduced as *irrorata simalura* n.
5. The commonest species in Java is *Trabala pallida* WALK., already described from specimens collected by HORSFIELD, though WALKER soon after had dropped this name as a synonym of *vishnou*. This proves to be erroneous. The ochreous female is called f.-♀ *ochrea* n., the green one f.-♀ *herbida* n., the mountain form is distinguished as *pallida montana* n., its dark female as f.-♀ *brunnescens* n., a female with the submarginal area filled up with dark scales as f.-♀ *effluens* n.
6. *Trabala leopoldi* TAMS proves to be a distinct species confined to Celebes and adjacent islands only. No other species is known from this region. The male is described for the first time. A very dark brownish green female is named f.-♀ *olivacea* n.
7. From New Guinea only one species is recorded with certainty, viz. *Tr. viridana* JOIC. & TALB.
8. The following new species are described from the Archipelago:
 - Tr. krishna* ♂♀: Java, Sum., Bil., Mal., Mergui,
 - " " f.-♀: *hemichlora*: Djambi (C. Sum.); Samarinda (S.E. Born.),
 - " *brahma* ♂♀: Java mountains; Bali mountains,
 - " *ganesha* ♂♀: Java; Borneo; Sum., Sing., Mal.,
 - " *arjuna* ♂♀: Java, higher mountains,
 - " *shiva* ♂: Java, Sum., Born.,
 - " *gautama* ♂: S. Sum.,
 - " *garuda* ♂♀: Korintji (C. Sum.),
 - " *hantu* ♂♀: Korintji (C. Sum.),
 - " *indra* ♀: Deli (Sum.); N. Born.
9. Six new species are recorded from the Philippines:
 - Tr. mahatma* ♂: Mindanao,

- Tr. subadra* ♂: Luzon,
„ *sudara* ♂: Mindanao,
„ *rama* ♂: Mindanao,
„ *durga* ♂: Mindanao,
„ *mahadeva* ♂: Mindanao.

Moreover, three females are described from the Philippines belonging to two different species which cannot yet become ascribed to their corresponding males.

Wageningen, April 1950. (Issued June 18, 1951).

EXPLANATION OF PLATES

PLATE 1

(More or less slightly reduced)

- Fig. 1. *Trabala pallida* WALK. ♀: Semarang, C. Java.
 " 2. " " " ♀: Buitenzorg, W. Java.
 " 3. " " *montana* RPKE ♀: Mt. Lawu, C. Java.
 " 4. " " " f. *effluens* RPKE ♀: Tjinieruan, W. Java.
 " 5. " " f. *herbida* ♀ RPKE: Pantjar, W. Java.
 " 6. " *irrorata* MOORE ♀: Java
 " 7. " " " ♀: Giestings, S. Sumatra.
 " 8. " *brahma* RPKE ♀: Mt. Gedeh, W. Java.
 " 9. " *irrorata simalura* ♀: Isl. of Simalur, N. Sumatra.
 " 10. " *ganesha* RPKE ♀: W. Java.
 " 11. " *indra* RPKE ♀: Deli, Sumatra.
 " 12. " *leopoldi* TAMS ♀: Menado, N. Celebes.

PLATE 2

(Slightly reduced)

- Fig. 1. *Trabala pallida* WALK. ♀: caterpillar on damaged leaf of the food plant, *Eugenia* sp. About nat. size.
 " 2. *Trabala pallida* WALK. ♀: freshly emerged, in resting position on cocoon. Somewhat reduced.

PLATE 3

(About nat. size)

- Fig. 1. *Trabala pallida* WALK. ♂: Semarang, C. Java.
 " 2. " " *montana* RPKE ♂: Mt. Ardjuno, E. Java.
 " 3. " *ganesha* RPKE ♂: Mt. Idjen, E. Java.
 " 4. " *irrorata* MOORE ♂: Deli, Sumatra.
 " 5. " *brahma* RPKE ♂: Perbawattee, W. Java.
 " 6. " *krishna* RPKE ♂: Kariorang, S.E. Borneo.
 " 7. " *arjuna* RPKE ♂: Patuhawattee, W. Java.
 " 8. " *shiva* RPKE ♂: Goalpara, W. Java.

PLATE 4

(About nat. size)

- Fig. 1. *Trabala gautama* RPKE ♂: Lampongs, S. Sumatra.
 " 2. " *durga* RPKE ♂: Surigao, Phil. Isl.
 " 3. " *mahadeva* RPKE ♂: Surigao, Phil. Isl.
 " 4. " *mahatma* RPKE ♂: Surigao, Phil. Isl.
 " 5. " *vishnou* LEF. ♂: Khasis, India.
 " 6. " *leopoldi* TAMS ♂: Menado, N. Celebes.
 " 7. " *subadra* RPKE ♂: Haight's Place, Luzon, Phil. Isl.
 " 8. " *mahatma* RPKE ♂: Mindanao, Phil. Isl.
 " 9. " *sudara* RPKE ♂: Kolambugan, Mindanao, Phil. Isl.
 " 10. " *rama* RPKE ♂: Surigao, Phil. Isl.

PLATE 5

(About nat. size)

- Fig. 1. *Trabala garuda* RPKE: Mt. Korintji, Sumatra.
 " 2. " *hantu* RPKE: Mt. Korintji, Sumatra.
 " 3. " sp. ♀: Surigao, Mindanao, Phil. Isl.
 " 4. " sp. ♀: Surigao, Mindanao, Phil. Isl.

PLATE 6

Tergites IX-X (tegumen + uncus), ♂

- Fig. 1. *Trabala vishnou* LEF.: N. India (132 T.*).
 " 2. " " " Karwar (138 T.).
 " 3. " " " Kwanshien, China (140 T.).
 " 4. " " " Moulmein (146 T.).
 " 5. " " " Formosa (152 T.).
 " 6. " " " monstrosity: Shillong, Assam (86 T.).
 " 7. " " *singhala* RPKE: Ceylon (148 T.).
 " 8. " " LEF.: China (118 T.).

PLATE 7

Tergites IX-X (tegumen + uncus), ♂

- Fig. 1. *Trabala vishnou* LEF.: Ta-Tsien-Lou, Moupin (153 T.).
 " 2. " " " Honkong (147 T.).
 " 3. " " " Formosa (139 T.).
 " 4. " *krishna* RPKE: Mt. Dulit, N. Borneo (162 T.).
 " 5. " *brahma* RPKE: Nongkodjadjar, Mt. Tengger, E. Java (125 T.).
 " 6-7. " *mahatma* RPKE: Mindanao, Phil. Isl. (111 T.).
 " 8. " *viridana* JOIC. & TALB. Wandaman Mts., N. New Guinea.
 (119 T.) Right projections broken off and placed separately.

PLATE 8

- Fig. 1. *Trabala irrorata* MOORE ♀, lecto-holotypus, last abdominal segments, dorsally. Java.
 " 2. " *gautama* RPKE ♂: holotypus, terg. IX-X. Lampongs (117 T.).
 " 3. " *garuda* RPKE ♂: terg. IX-X. Korintji (156 T.).
 " 4. The same as f. 1, ventrally, showing ostium bursae copulatricis.
 " 5. *Trabala sudara* RPKE ♂: holotypus, terg. IX-X. Philippines.
 " 6. " *subadra* RPKE ♂: terg. IX-X. Philippines.

PLATE 9

Tergites IX-X (tegumen + uncus), ♂

- Fig. 1. *Trabala pallida* WALK.: Bandung, W. Java (9 W.**).
 " 2. " " " Tjiandjur, W. Java (1 W.).
 " 3. " " " Bandung, W. Java (3 W.).
 " 4. " " " Semarang, C. Java (11 W.).
 " 5. " " " Bandung, W. Java (2 W.).
 " 6. " " " Semarang, W. Java (21 W.).
 " 7. " " *montana* RPKE: Mt. Ardjuno, E. Java (14 W.).

*) These numbers refer to Mr Tams' dissections.

**) These numbers refer to the slides in the Wageningen collection.

- Fig. 8. *Trabala pallida montana* RPKE: Mt. Patuha, W. Java (5 W.).
 " 9. " " " " Mt. Ardjuno, E. Java (15 W.).
 " 10. " " " " Mt. Lawu, E. Java (6 W.).
 " 11. " *ganesha* RPKE: Perbawatee, W. Java (22 W.).
 " 12. " " " " Bajukidul, E. Java (18 W.).

PLATE 10

Tergites IX-X (tegumen + uncus), ♂

- Fig. 1. *Trabala irrorata* MOORE: Deli, Sum. E.C. (17 W.).
 " 2. " " " " Sukabumi, W. Java (13 W.).
 " 3. " *brahma* RPKE: Perbawatee, W. Java (19 W.).
 " 4. " *krishna* RPKE: Djambi, C. Sum., (7 W.).
 " 5. " " " " Deli, Sum. E.C. (16 W.).
 " 6. " " " " Kariorang, S.E. Born. (4 W.).
 " 7. " *arjuna* RPKE: Mt. Patuha, W. Java (10 W.).
 " 8. " *shiva* RPKE: Goalpara, W. Java (12 W.).

PLATE 11

Valvae ♂.

- Fig. 1. *Trabala pallida* WALK.: Bandung, W. Java (9 W.).
 " 2. " " *montana* RPKE: Mt. Lawu, C. Java (6 W.).
 " 3. " *ganesha* RPKE: Perbawatee, W. Java (22 W).
 " 4. " *irrorata* MOORE: Sukabumi, W. Java (13 W.).
 " 5. " *brahma* RPKE: Perbanatee, W. Java (22 W).
 " 6. " *krishna* RPKE: Djambi, C. Sum. (7 W).
 " 7. " *arjuna* RPKE: Mt. Patuha, W. Java (10 W).
 " 8. " *shiva* RPKE: Goalpara, W. Java (12 W).
 " 9. *leopoldi* TAMS: Makassar, S. Celebes (cat. 68, Mus. Leiden).

PLATE 12

Aedeagi ♂.

- Fig. 1. *Trabala pallida* WALK.: Tjiandjur, W. Java (1 W).
 " 2. " " *montana* RPKE: Mt. Ardjuno, E. Java (14 W).
 " 3. " *ganesha* RPKE: Perbawatee, W. Java (22 W).
 " 4. " *irrorata* MOORE: Deli, Sum. E.C. (17 W).
 " 5. " *brahma* RPKE: Perbawatee, W. Java (19 W).
 " 6. " *krishna* RPKE: Deli, Sum. E.C., (16 W).
 " 7. " *shiva* RPKE: Goalpara, W. Java (12 W).

PLATE 13

Tergites IX-X (tegumen + uncus) ♂.

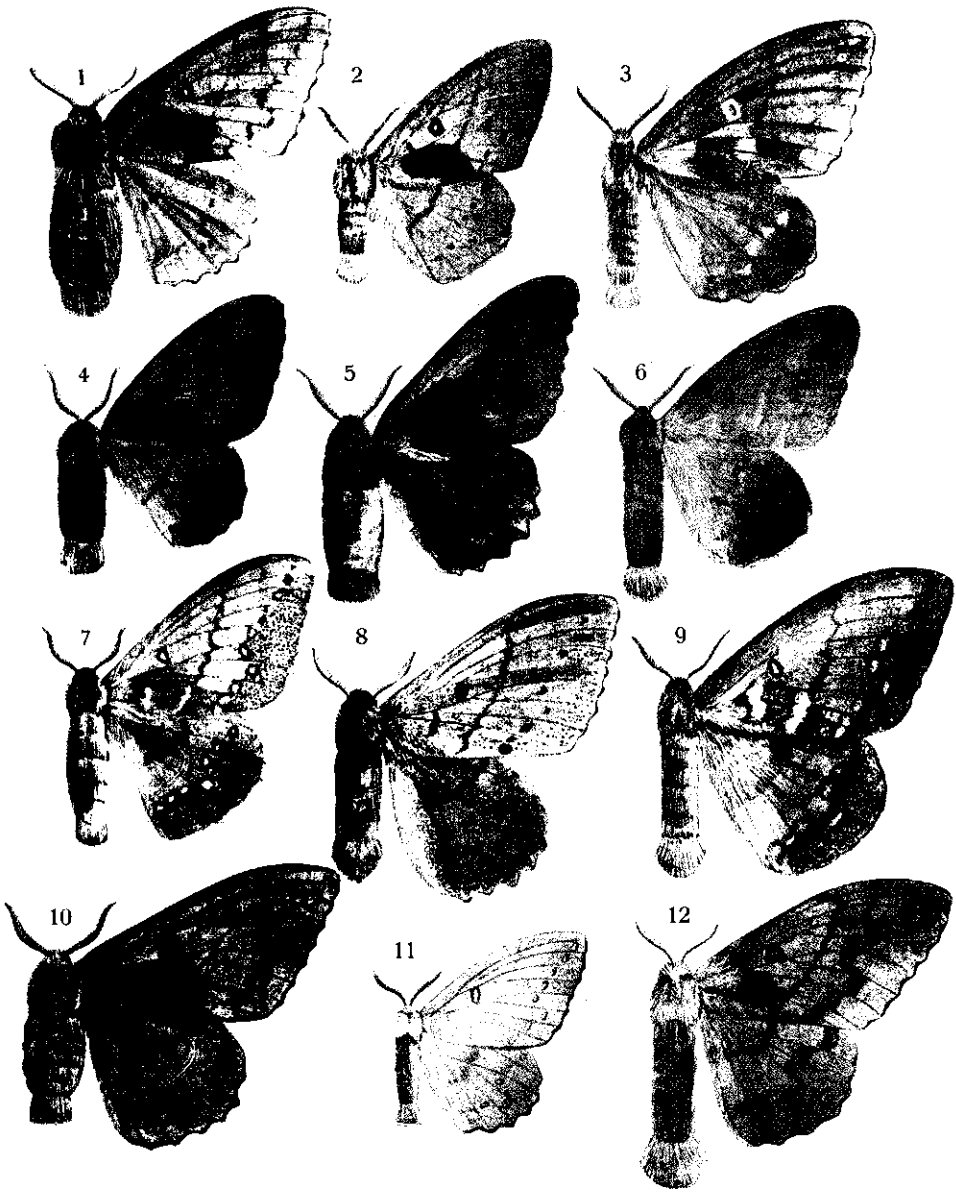
- Fig. 1. *Trabala pallida* WALK.: Belawan-Deli, Sum. E.C. (134 W).
 " 2. " *vishnou* LEF.: Khasis, India (42 W).
 " 3. " " " LEF.: Kanara, India (42 W).
 " 4. " *singhala* RPKE, holotypus, Peradenyia, Ceyl. (123 W).
 " 5. " *hantu* RPKE: Mt. Korintji, C. Sum. (124 W).
 " 6. " *leopoldi* TAMS: Nulion, Banggai Arch. (47 W).
 " 7. " " " TAMS: Makassar, S. Cel. (68 W).
 " 8. " " " TAMS: Minahassa, N. Cel. (46 W).
 " 9. " *brahma* RPKE: Baturiti, Bali (127 W).

PLATE 14

Trabala ♂♂ from the Philippines.

Fig. 1.	<i>Trabala mahatma</i>	RPKE:	Surigao, Mind.;	terg. VIII	(136 W*)
" 2.	"	"	"	"	aedeagus (136 W).
" 3.	"	"	"	"	terg. IX (136 W).
" 4.	"	<i>durga</i>	RPKE	"	terg. IX-X (138 W).
" 5.	"	"	"	"	aedeagus (138 W).
" 6.	"	<i>rama</i>	RPKE:	"	terg. IX-X (137 W).
" 7.	"	<i>mahadeva</i>	RPKE:	"	terg. IX-X (139 W).
" 8.	"	<i>rama</i>	RPKE:	"	aedeagus (137 W).
" 9.	"	<i>mahadeva</i>	RPKE:	"	aedeagus (138 W).
" 10.	"	<i>rama</i>	RPKE:	"	valva (137 W).
" 11.	"	<i>durga</i>	RPKE:	"	valva (138 W).
" 12.	"	<i>mahadeva</i>	RPKE:	"	valva (136 W).
" 13.	"	<i>mahatma</i>	RPKE:	"	valva (139 W).

*) The slides 136-139 W are now in the U.S. Nat. Mus. Washington, D.C.



Corstanje pinx.

About Natural Size

PLATE II

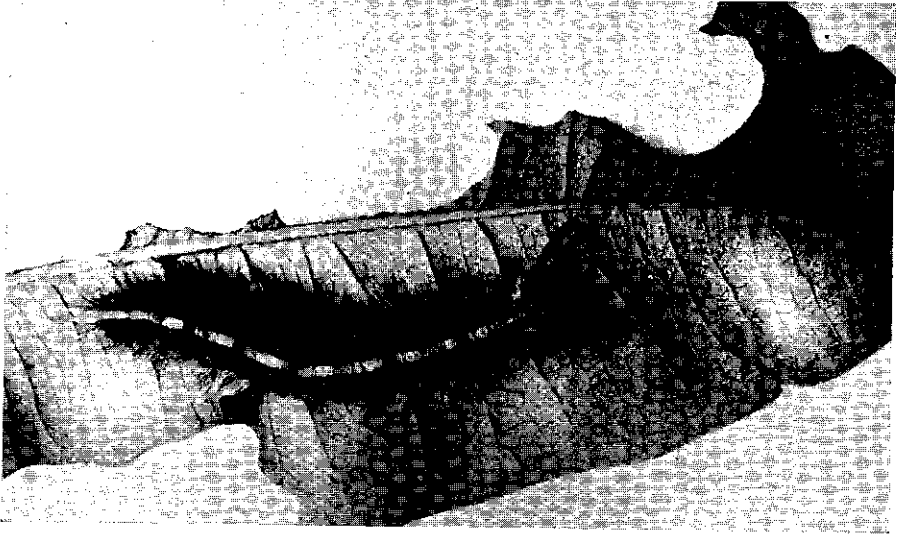


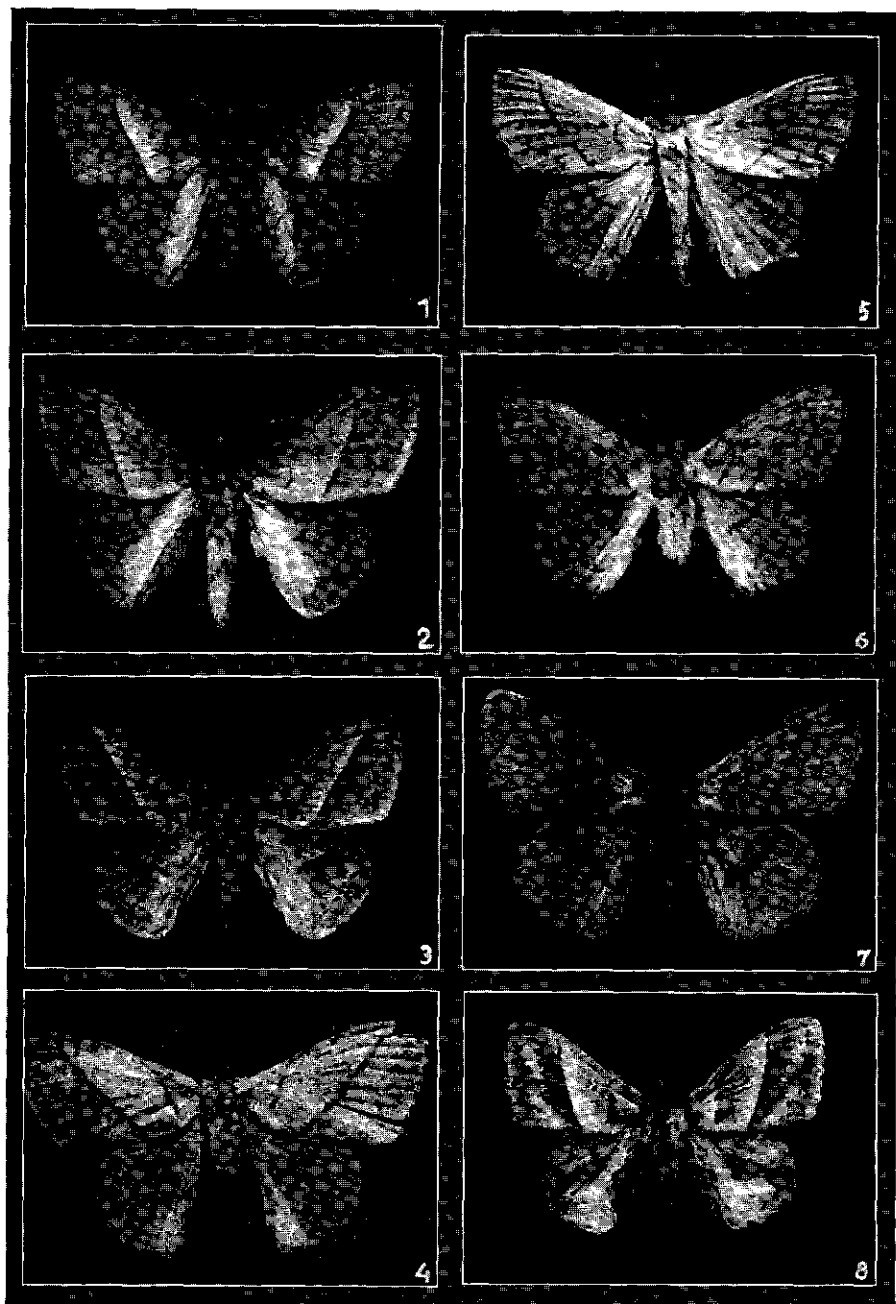
Fig. 1.



Fig. 2.

Rospeke phot.

Natural size



Roecke phot.

Natural size

PLATE IV

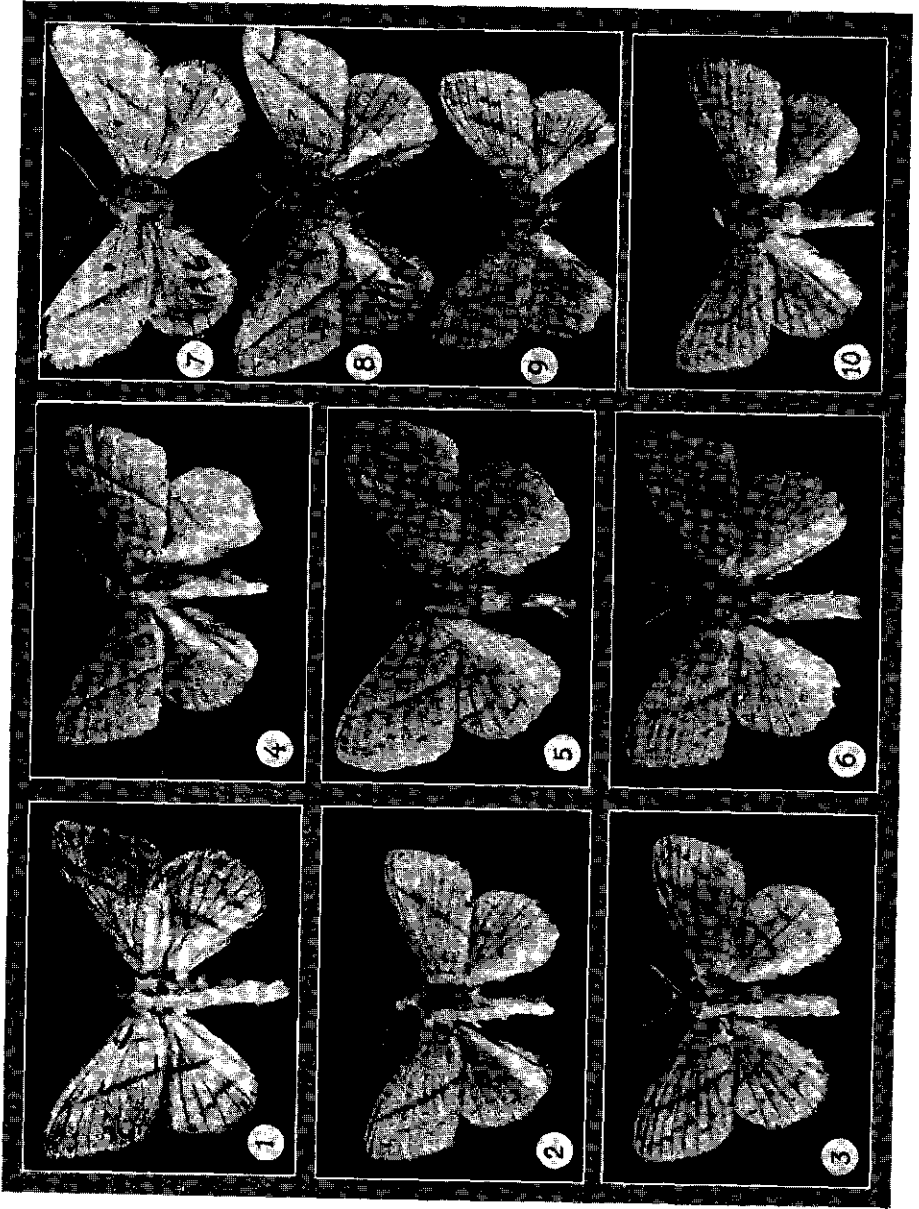
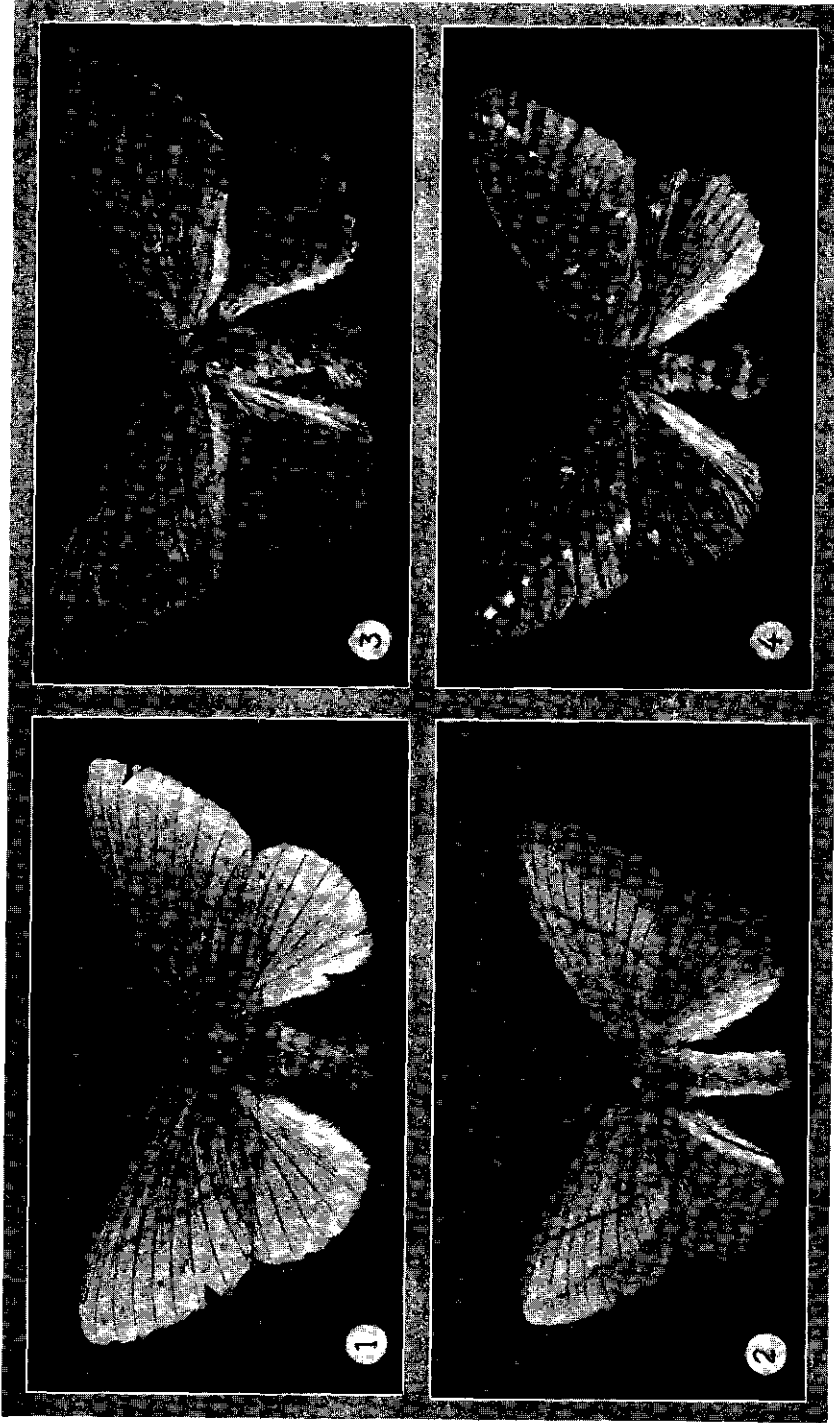


Fig. 1, 7-9 Tams phot., fig. 2-4, 10 Greenstein phot., fig. 5-6 Roepke phot.

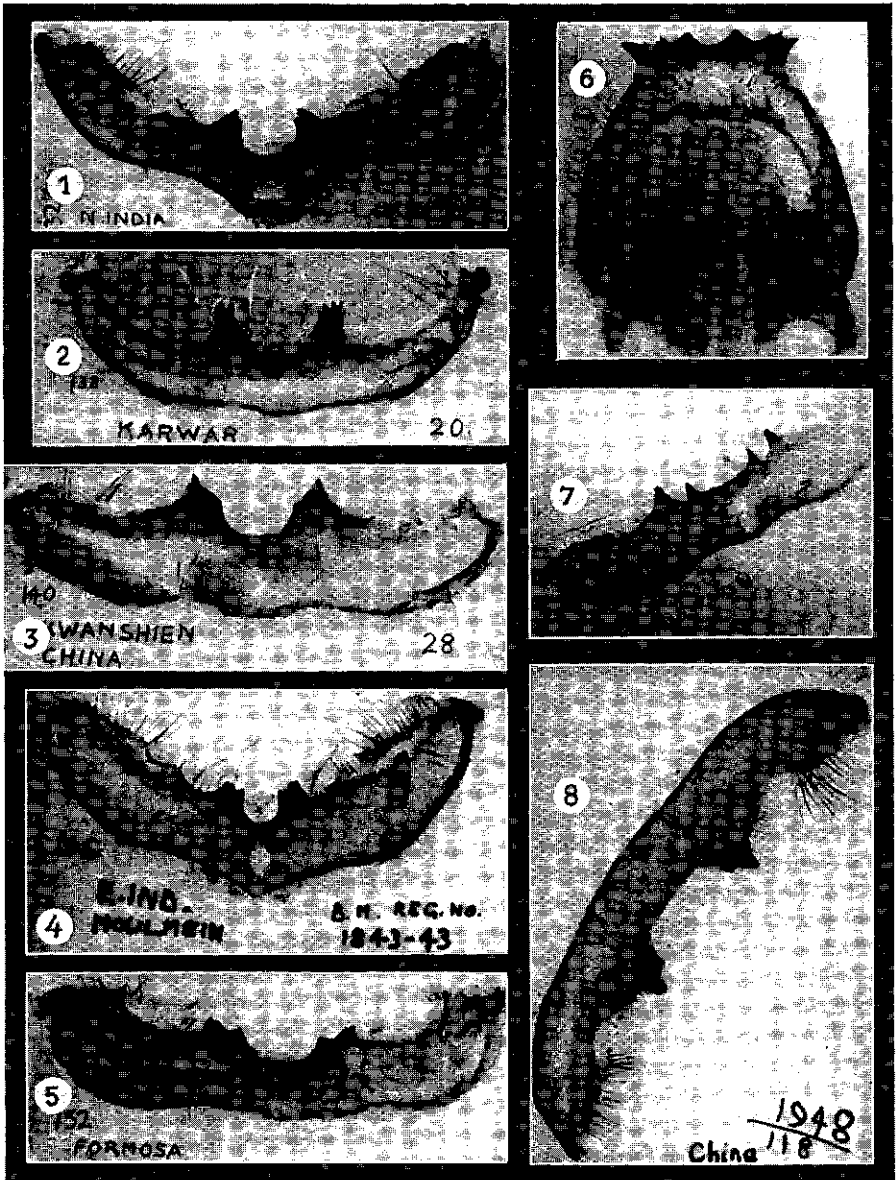
PLATE V



1 - 2 *Tams* phot., 3 - 4 *Groenestein* phot.

About Natural Size

PLATE VI



Tams microphot.

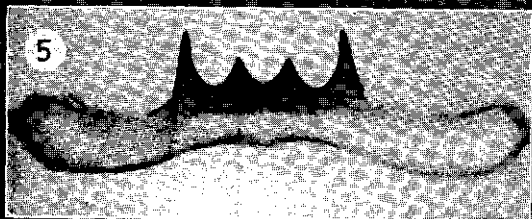
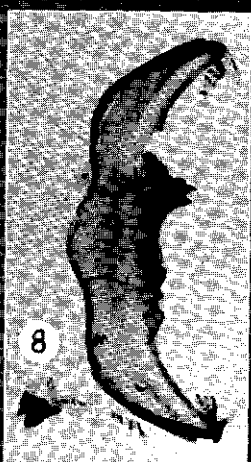
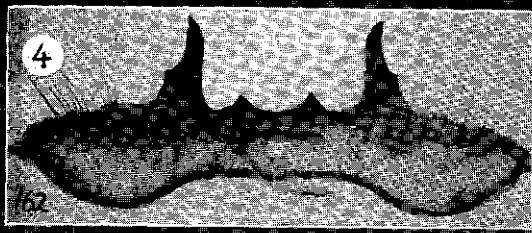
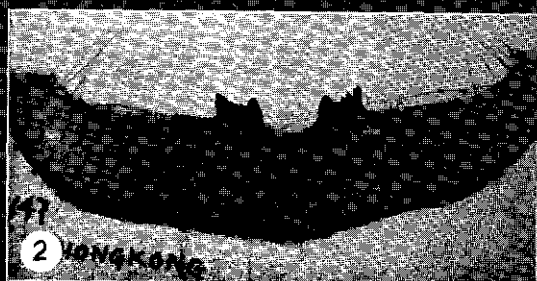
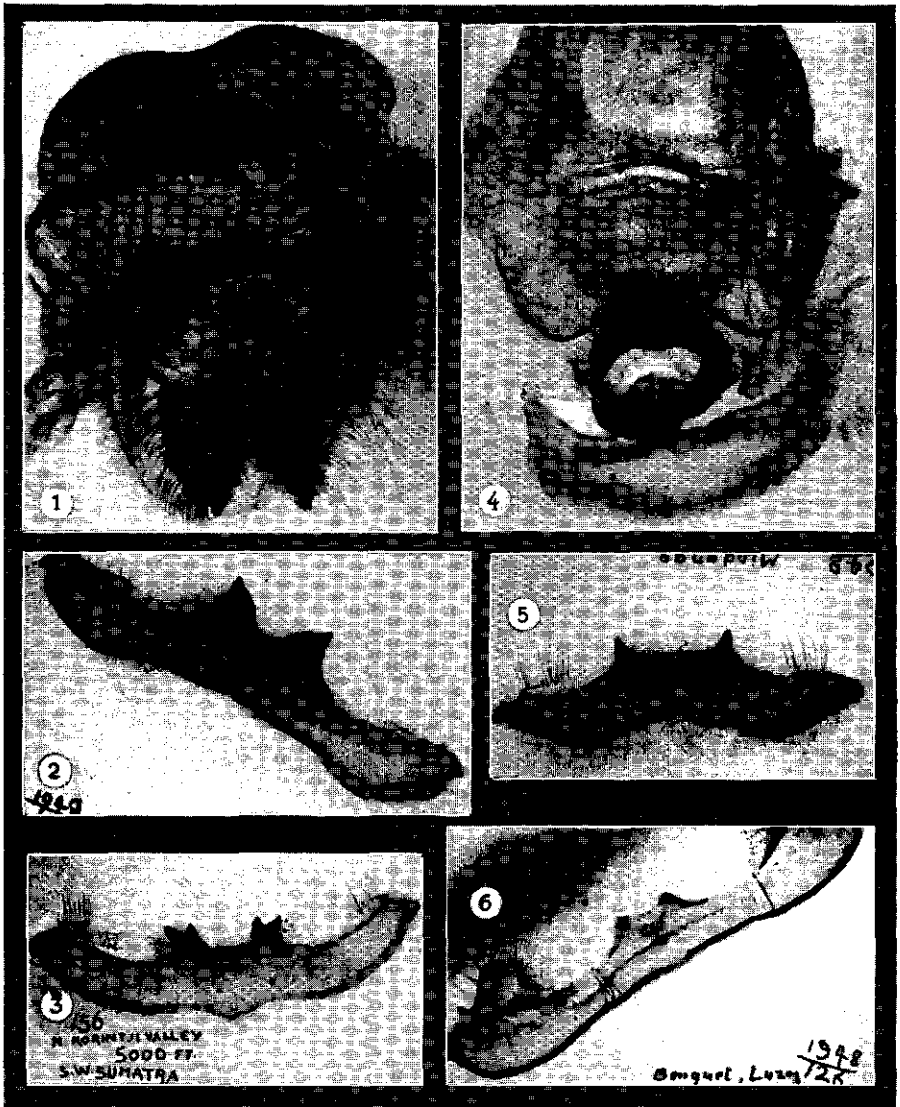
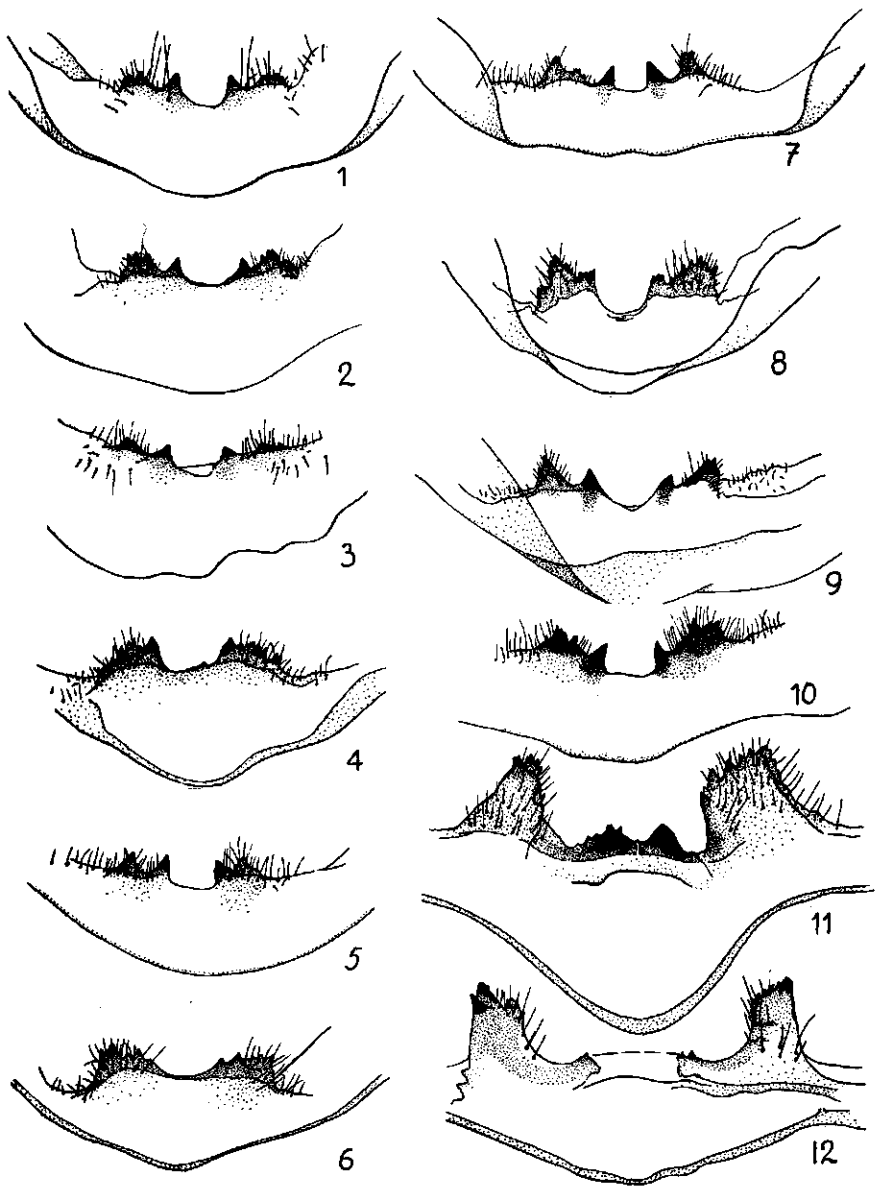


PLATE VIII

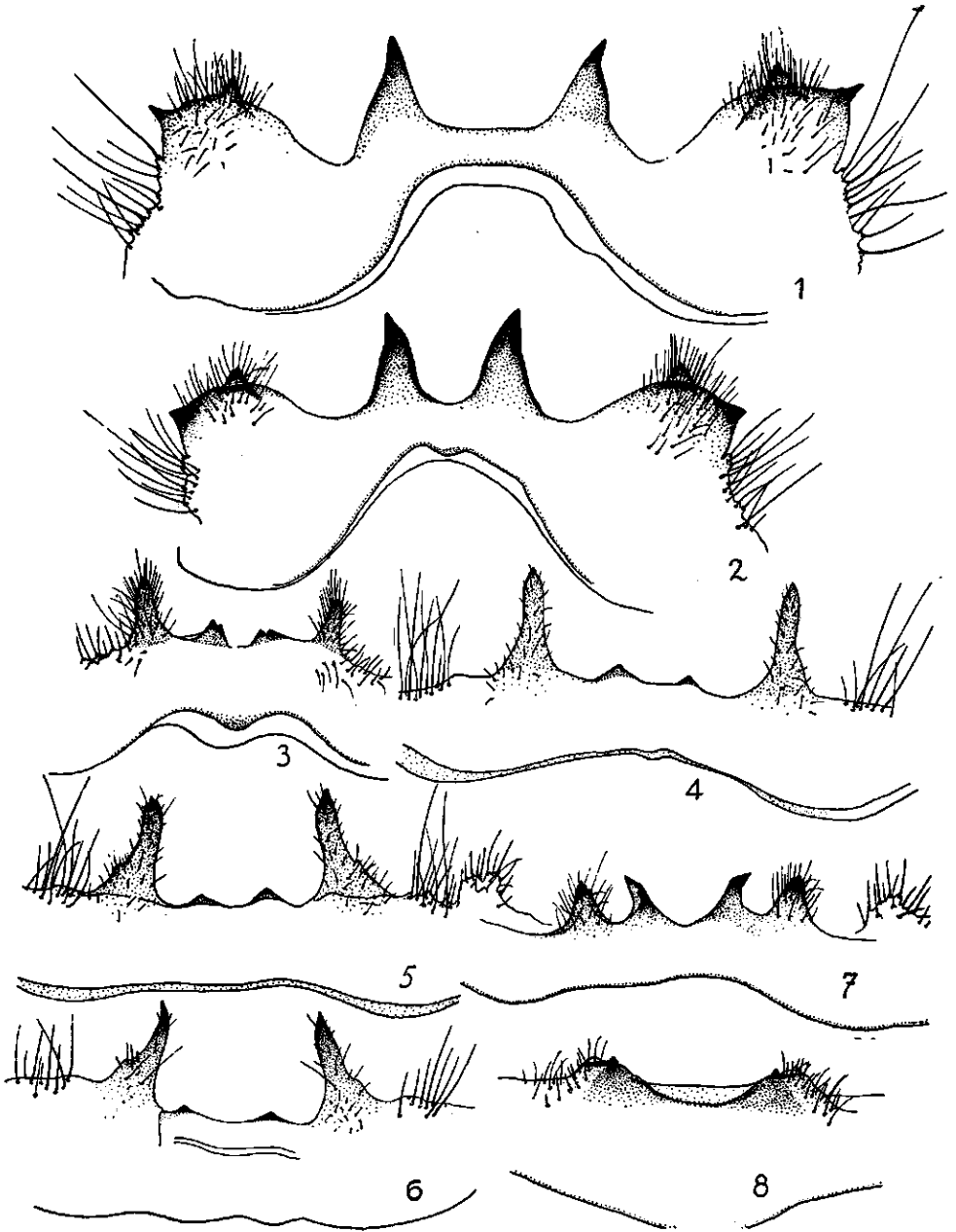


Tams microphot.



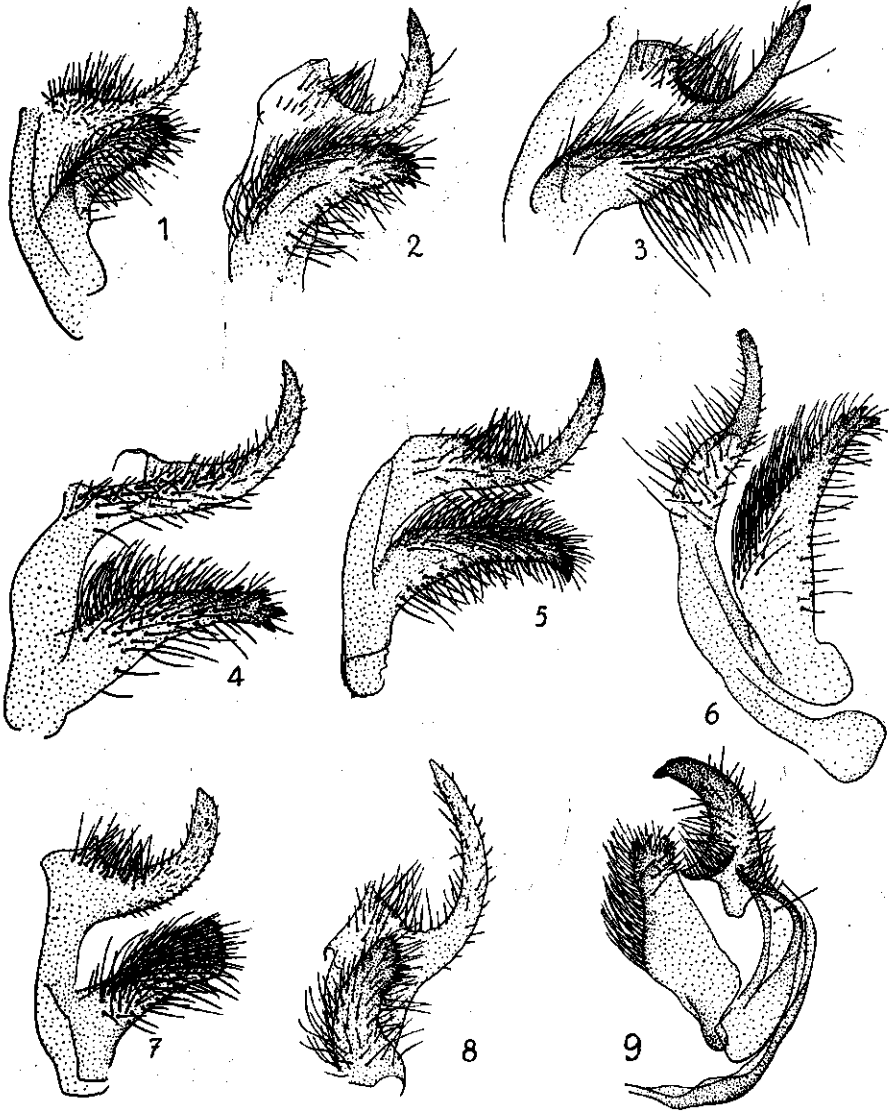
Tergites IX + X (unc + teg) of different *Trabala* males. *Corstanje del.*

PLATE X



Tergites IX + X (unc + teg) of different *Trabala* males.

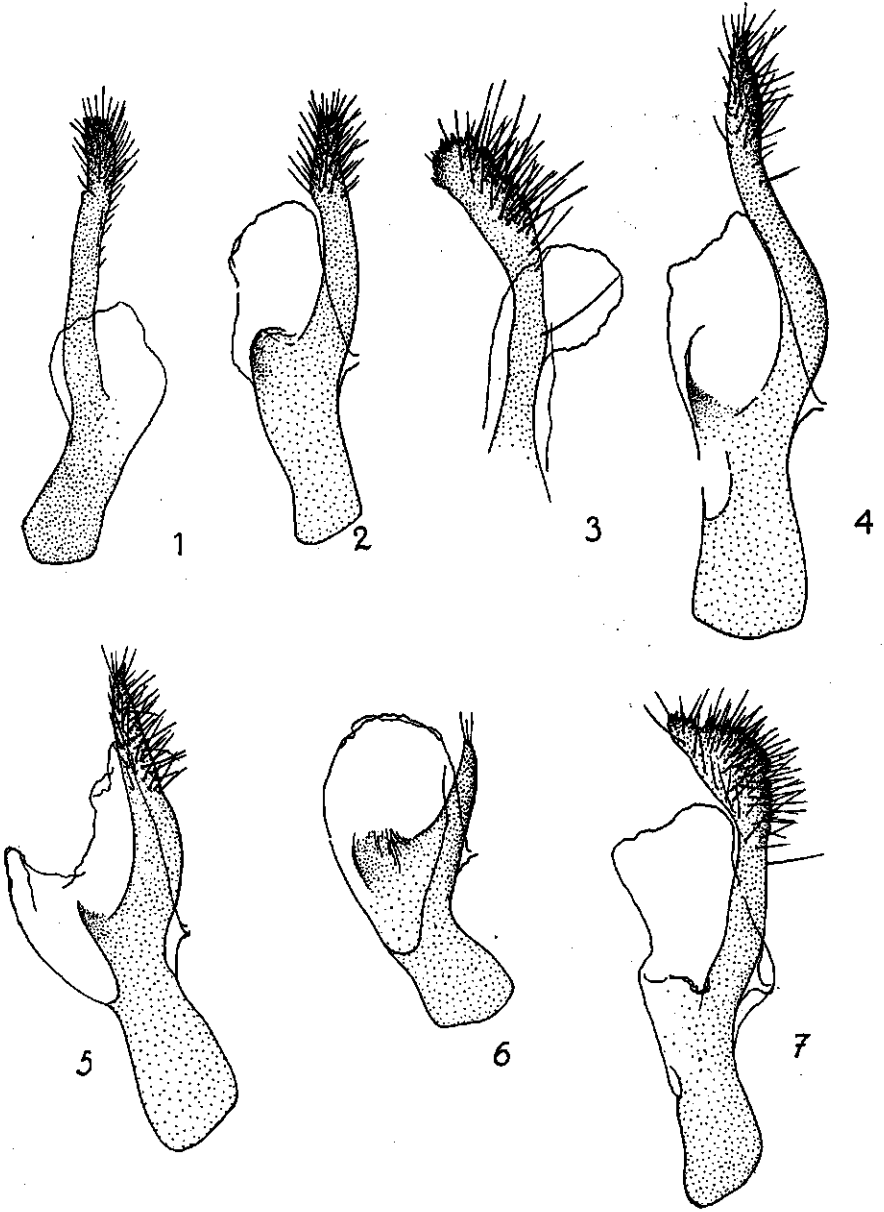
Corstanje del.



Valvae of different *Trabala* males.

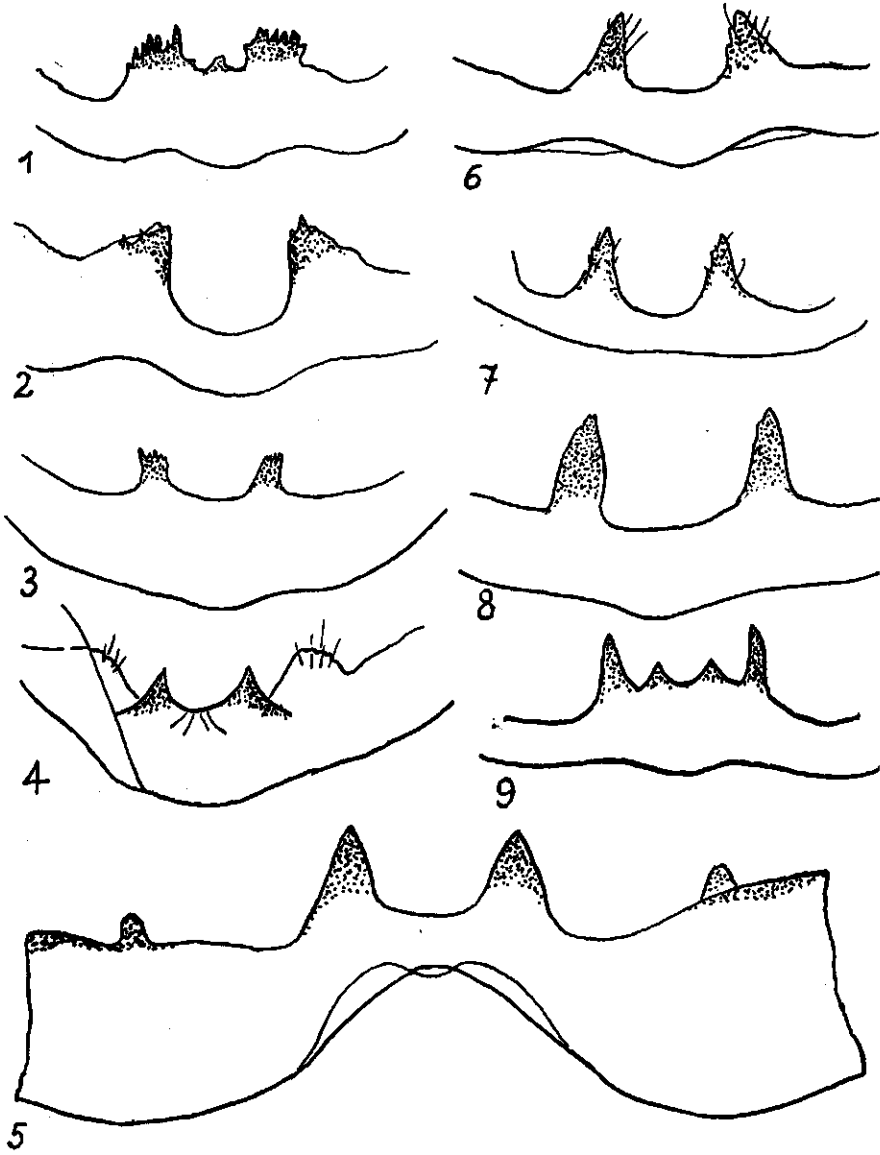
Corstanje del.

PLATE XII



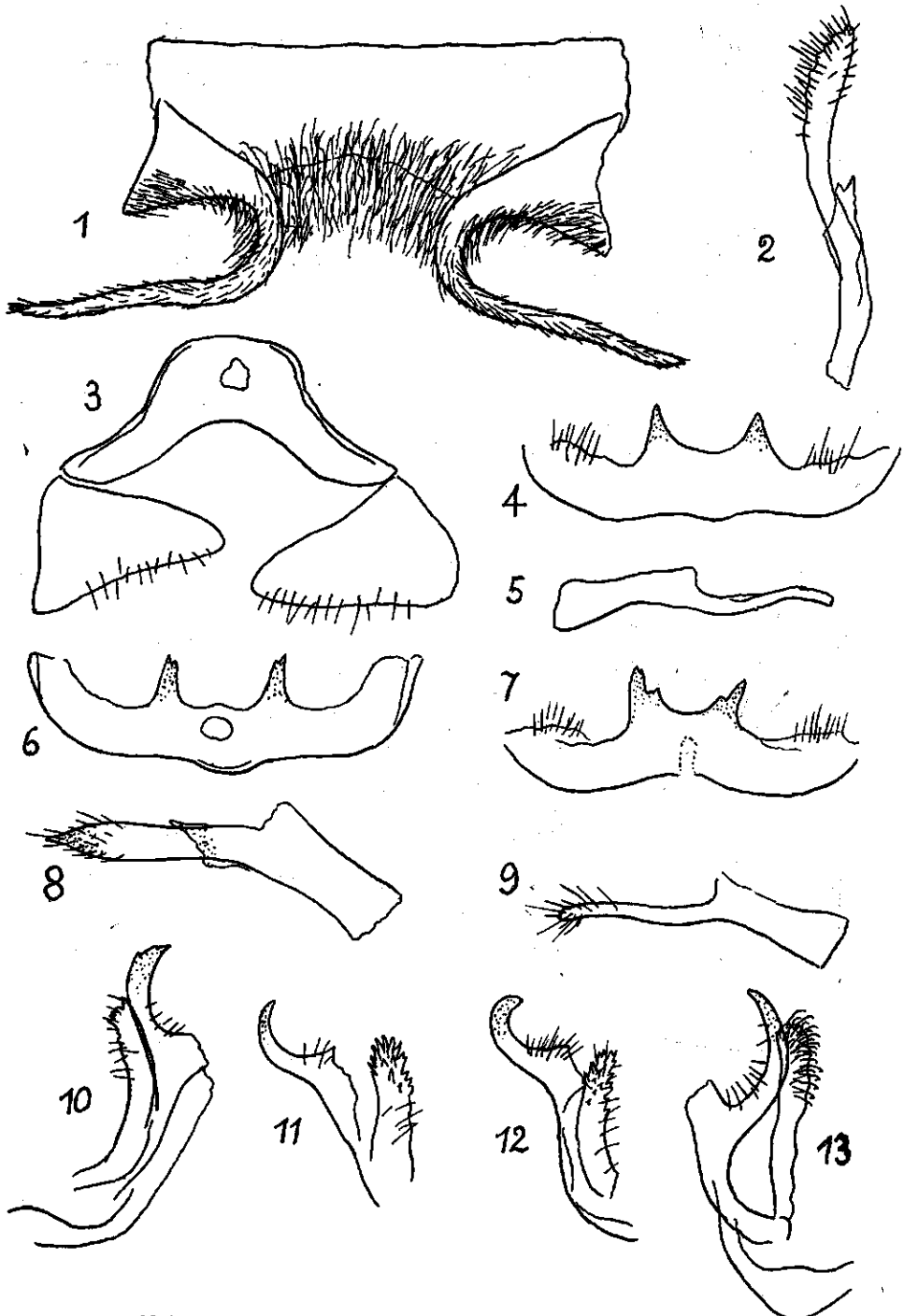
Aedeagi of different *Trabala* males.

Corstanje del.



Tergites IX + X (unc + teg) of different *Trabala* males. *Roepke del.*

PLATE XIV



Male genitalia of *Trabala* species from the Philippines.

Rospke del.