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THE ANTHONOMINI FROM MALAYSIA, WITH NOTES ON THE ORIENTAL TAXA (COLEOPTERA: CURCULIONIDAE)

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ABSTRACT

The Oriental genera and Malaysian species of Anthonomini were examined. The genera *Anthonomus*, *Usingerius*, *Onycocnemis* and *Sphincticraerus* were recognized as the members of Anthonomini, but the following genera were excluded from this tribe: *Adelus* Schoenherr (= *Imerodes* Marshall, syn. nov.) (Ochyromerini), *Pseudoophagus* Voss (Eugnomini), *Synnadophila* Voss (Ochyromerini), *Telphasia* Pascoe (Curculioninae, incertae sedis). Poorly known genera, *Minyrus* Schoenherr, *Ontoctetorus* Faust, *Batyorygma* Marshall and *Sphincticraeopsis* Voss have sometimes been classified in Anthonomini, and now placed incorrectly in Ellescini or Calyptini were transferred to Ochyromerini except *Batyorygma*, which was uncertain in position. A total of four species were recognized from Malaysia in two genera: *Usingerius parvidens* Zimmerman, 1946, stat. nov., new to the Peninsular Malaysia and three species of *Anthonomus* (*Tachypterellus*): *A. nodulosus* Marshall and its allied new speceis, *A. seminodulosus*

sp. nov., and *A. humerulus* sp. nov. Species of the subgenus *Tachypterellus* were newly divided into two species-groups on the features of pronotum and aedeagus. A catalogue of the Oriental species of Anthonomini was provided.

ABSTRAK

Genus-genus Oriental dan spesies dari Malaysia bagi Anthonomini diperiksa. Genus *Anthonomus*, *Usingerius*, *Onycocnemis* dan *Sphincticraerus* dicamkan sebagai ahli Anthonomini, tetapi genus-genus tersebut tidak termasuk di dalam trib ini: *Adelus* Schoenherr (= *Imerodes* Marshall, syn. nov.) (Ochyromerini), *Pseudoophagus* Voss (Eugnomini), *Synnadophila* Voss (Ochyromerini), *Telphasia* Pascoe (Curculioninae, incertae sedis). Genus yang kurang dikenali, *Minyrus* Schoenherr, *Ontoctetorus* Faust, *Batyorygma* Marshall dan *Sphincticraeopsis* Voss kadang-kadang dikelaskan di dalam Anthonomini, dan kini dikelaskan dengan salah di dalam Ellescini atau Calyptini dan dipindahkan ke Ochyromerini kecuali *Batyorygma*, di mana kedudukannya tidak dipastikan. Sejumlah empat species dikenalpasti dari Malaysia di dalam dua genus: *Usingerius parvidens* Zimmerman, 1946, stat. nov., baru di Semenanjung Malaysia dan tiga spesies *Anthonomus* (*Tachypterellus*): *A. nodulosus* Marshall dan bersamaan dengan spesies baru, *A. seminodulosus* sp. nov., dan *A. humerulus* sp. nov. Spesies ke atas subgenus *Tachypterellus* baru dibahagikan kepada dua kumpulan spesies berdasarkan ciri-ciri ke atas pronotum dan aedeagus. Katalog spesies Oriental bagi Anthonomini disertakan.

INTRODUCTION

Weevils of the tribe Anthonomini are generally known to be associated with flower buds, flower heads or fruits, and belong to the subfamily Curculioninae, often referred as “flower weevils”. They are predominant in the Nearctic and Neotropical regions. A total of 23 genera and about 700 species are known from both regions. In the Palaearctic region, only four genera, of which two are common to the New World and about 80 species are known

to occur on record. The Afrotropical and Oriental regions contain relatively few anthonomines, and most genera now assigned in this tribe from the Afrotropical region are actually not the true member of this taxon (Kojima, unpublished data), and the Pacific and Australian regions lacks them except *Usingerius* occurring in Guam and the Marianas, and two *Anthonomus* species, which are doubtful in their distribution.

In the Oriental region, eight genera are known to occur on record (Alonso-Zaragza & Lyal, 1999, 2002): *Adelus* Schoenherr, 1835 (=*Lathiphronus* Schoenherr, 1843), *Anthonomus* Germar, 1817, *Onychocnemis* Marshall, 1917, *Pseudoophagus* Voss, 1935 (= *Apionodes* Marshall, 1948), *Sphincticraerus* Marseul, 1871, *Synnadophila* Voss, 1937, *Telphasia* Pascoe, 1885 and *Usingerius* Zimmerman, 1942. However, most of these genera should be excluded from the true Anthonomini except for *Anthonomus*, *Usingerius*, *Onychocnemis* and two species of *Sphincticraerus*, which are unknown to us (see below). Thus, three or four genera must be the known members from the Oriental region.

Anthonomus is represented by two subgenera *Anthonomus* s. str. and *Tachypterellus*. They contains a small number of species (10 species) from Taiwan and South China, and *Tachypterellus* is also known from Java, Borneo and Peninsular Malaysia in the Oriental region. One species of *Usingerius* is known from the Philippines and Borneo. A monotypical genus *Onychocnemis* known from India has the unusual features such as the broad rostrum, the connate claws at base, and the uncinate as well as mucronate tibiae among Anthonomini.

In this paper, we reviewed the Anthonomini genera of the Oriental region and species from Malaysia. They consist of four species. One is *Usingerius parvidens* Zimmerman (stat. nov.) described from Borneo as a subspecies of *U. rubens* Zimmerman from the Philippines. This is regarded as a distinct species in this study and recorded from the peninsular area for the first time. The others are three species of *Anthonomus* (*Tachypterellus*): *A.* (*T.*) *nodulosus* Marshall, *A.* (*T.*) *seminodulosus* sp. nov. and *A.* (*T.*) *humerulus* sp. nov. We also give omments on the distribution of the Malaysian fauna of Anthonomini.

Abbreviations used in this paper are as follows: UKM: Universiti Kebangsaan Malaysia; KUM: Kyushu University Museum; ELKU: Entomological Laboratory, Kyushu University.

NOTES ON THE ORIENTAL GENERA OF ANTHONOMINI

Eight genera of Anthonomini are now on record from the Oriental region (Alonso-Zarazaga & Lyal, 1999, 2002). However, the following subsequent genera should be excluded from Anthonomini. Definition of Anthonomini follows of that of "Tribus Anthonomina" of Thomson (1859), tribe Anthonomini of Reitter (1913), Hoffmann (1954), Dieckmann (1968), Voss (1944) and many others, or subfamily Anthonominae of Morimoto (1962), Burke (1976) and Kojima & Morimoto (1994): Phanerognathous; eyes more or less convex; rostrum cylindrical; procoxae generally contiguous with each other; tibiae usually uncinate at least in fore and middle pairs; tarsal claws not widely divergent, generally each with cleft, sharp tooth and a seta; posterior margins of abdominal ventrites 2-4 straight; aedeagus with median lobe narrowed or emarginate at base in lateral aspect, and articulated with median struts at ventral plate; sternite 8 of male paired, devoid of setae or hairs along caudal margin; sternite 9 of male bilobed, with apodeme more or less curved and oblique to axis of aedeagus, and spermatheca with lateral lobe indefinite, spermathecal gland long, linear.

Adelus Schoenherr, 1835 (=*Lathiphronus* Schoenherr, 1843) has remained untouched on its feature since Lacordaire (1863), who treated this genus in "Anthonomus vrais" and only enumerated by Schenkling & Marshall (1934) in the Anthonominae and in the Anthonomini by Alonso-Zarazaga & Lyal (1999) in their catalogues. After examination of type specimen by the senior author, it was confirmed to be conspecific with *Imerodes rufescens*, which is the type species of *Imerodes* Marshall, 1926 assigned in the Ochyromerini or Tychiini: Ochyromerina (new placement), and the synonymy is as follows:

Genus *Adelus* Schoenherr, 1835(1836)

Adelus Schoenherr, 1835, Gen. Sp. Curc., 3(1): 328 (type species: *Adelus cupreus* Gyllenhal, 1836)
Lathiphronus Schoenherr, 1843, Gen. Sp. Curc., 7(2): 192 (unavailable replacement name for *Adelus*)
Imerodes Marshall, 1926, Treubia, 8: 347 (type species: *Amorphoidea rufescens* Motschulsky, 1858), syn. nov.
Homacalyptus Voss, 1953, Ent. Blätt., 49: 61 (type species: *Homacalyptus rufus* Voss, 1953), syn. nov.

Within this treatment, following subsequent species formerly assigned to *Imerodes* are newly combined with *Adelus*. Key to the species was given by Kojima & Morimoto (1995).

Adelus cupreus Gyllenhal, 1836

Adelus cupreus Gyllenhal, 1836, In Schoenherr, Gen. Sp. Curc., 3(1): 329.
Latiphronus cupreus: Gyllenhal, 1843, In Schoenherr, Gen. Sp. Curc., 7(2): 192.
Amorphoidea rufescens Motschulsky, 1858, Étud. Ent., 7: 82. syn. nov.
Imerodes rufescens: Marshall, 1926, Treubia, 8: 347. syn. nov.

Adelus angusticollis (Motschulsky, 1858), comb. nov.

Amorphoidea angusticollis Motschulsky, 1858, Étud. Ent., 7: 82.
Imerodes angusticollis: Marshall, 1926, Treubia, 8: 347

Adelus rufus (Voss, 1953), comb. nov.

Homacalyptus rufus Voss, 1953, Ent. Blätt., 49: 62.
Imerodes rufus: Voss, 1957, Treubia, 24: 21.

***Adelus sabanus* (Kojima & Morimoto, 1995), comb. nov.**

Imerodes sabanus Kojima & Morimoto, 1995, Esakia, 35: 107.
Pseudoopghagus Voss, 1935 (= *Apionodes* Marshall, 1948) is likely to be a member of Eugnomini as was treated by Kojima & Morimoto (1993).

The monotypical genus *Synnadophila* Voss, 1937 has the posterior margin of 2nd abdominal ventrite broadly curved posteriorly. This feature as well as others such as the sharply toothed claws rather divergent are shared with those of *Nesendaeus* Marshall, 1931 of Ochyromerini or Tychiini: Ochyromerina. Thus, the position of *Synnadophila* is likely to be assigned there (new placement).

Telphasia Pascoe is one of the most difficult curculionid genera for its systematic position. Pascoe (1885) compared *Telphasia* with *Tychiosoma* Wollaston, which is now assigned in Cossoninae. However, this genus may be related with *Plaxes* Pascoe, 1885, which is also on enigmatic genus now assigned in Baridinae, in having the shiny and somewhat flattened body, the exposed pygidium, the posterior margins of abdominal ventrites 2-4 curved caudad at sides and the claws widely diverged. Thus, the position of *Telphasia* can not be determined at moment, but it is certain that the genus is at least not a member of Anthonomini.

Two species of the African and Mediterranean genus *Sphincticraeus* Marseul, 1871 (=*Aubeus* Desbrochers, 1873) was described from India and the Philippines by Voss (1944). It is, however, unknown for us except for descriptions.

The other genera such as *Minyrus* Schoenherr, 1835, *Ontoctetorus* Faust, 1895, *Batyorygma* Marshall, 1926 and *Sphincticraeopsis* Voss, 1944 were poorly known after their original descriptions. The first three genera were enumerated in Anthonominae by Schenkling & Marshall (1934) and in Ellescini by Alonso-Zarazaga & Lyal (1999). And *Sphincticraeopsis* was described in Anthonomini and treated in Acalyptini latter by Voss (1953). *Minyrus*, *Ontoctetorus* and *Sphincticraeopsis* are similar to each other in having the head more or less constricted behind eyes and the posterior margins of abdominal ventrites 2-4 curved

caudad at sides, and thus they are better to be placed near *Adelus* Schoenherr (=*Imerodes* Marshall) and *Heterimerodes* Kojima & Morimoto, 1995 of Ochyromerini or Tychiini: Ochyromerina (new placement).

Batyorygma is another enigmatic genus, but it is apparent that at least the genus is neither a member of Ellescini nor Anthonomini.

As a result, *Anthonomus*, *Onychocnemis*, *Sphincticraerus* and *Usingerius* are retained as the confirmed genera in Anthonomini from the Oriental region.

MALAYSIAN ANTHONOMINI

Usingerius parvidens Zimmerman, 1946, stat. nov. (Figs. 1-15)

Unsigerius rubens parvidens Zimmerman, 1946, Proc. Haw. Ent. Soc., 12: 655 (type locality: Borneo).

REDESCRIPTION. Male. Length: 2.1-2.5 mm; width: 1.1-1.3 mm. Reddish brown, antennae and legs paler except antennal club and claws darker, derm with whitish to yellowish grey vestiture dorsally, except for the areas of dark flecks or bands of elytra, black squamules, and vestiture of legs and underside white.

Forehead between eyes about half as wide as base of rostrum. Rostrum 1.4 times as long as pronotum. Antennae inserted at apical 1/3 of rostrum, funicle with 1st segment nearly as long as 2nd and 3rd segments combined, 2nd a little shorter than 3rd and 4th segments combined, 3rd to 6th each subequal in length, a little longer than broad, club nearly as long as preceding 5 segments combined.

Prothorax 1.3-1.4 times as broad as long, broadest at about middle, clothed with squamules, which are whitish and densest on prescutellar lobe and also on sides. Scutellum clothed with fine whitish squamules. Elytra 1.3 times as long as broad, subparallel-sided on basal half, striae well defned, intervals with squamules directed caudad as usual, generally with dark postmedian transverse band and fleck before middle, the latter is sometimes

forming another indefinite transverse band. Legs with femora each with a small triangular tooth, which is at most about half the breadth of tibiae in fore pair, tibiae unarmed at tip, fore tibiae weakly sinuate internally.

Prosternum with coxae separated narrowly. Venter with 1st and 2nd ventrites not depressed at middle. Pygidium concealed. Terminalia as illustrated (Figs. 11-14), aedeagus subtriangular at apex, inner sac with fine spiculae.

Female. Length: 2.2-2.5 mm; width: 1.2-1.4 mm. Resembles male except antennae inserted a little beyond middle of rostrum. Spermatheca with long gland.

MATERIALS EXAMINED. PENINSULAR MALAYSIA: PERAK: 9 males and 3 females, 7 miles from Tapah, 10. iii. 2003, H. Kojima (on flower of *Saraca* sp.)(UKM & KUM). PAHANG: 1 male, Kuala Lompat, nr. Kuala Krau, 22-23. iii. 2002, H. & M. Kojima (KUM). 4 males and 2 female, Endau-Rompin Park, 6. vii. 2003, insecticide fogging of trees incl. *Neobalanocarpus hemi* and *Koompassia excelsa*; 1 male and 3 females, 8. vii. 2003, insecticide fogging of trees incl. *Koompassia excelsa* and *Shorea leprosula* (UKM & KUM).

BIOLOGY. The weevils were found on the flower of *Saraca* sp. of the Leguminosae in the lowland forest, and also caught from lowland forest canopy by the knockdown insecticide fogging of trees including *Neobalanocarpus* and *Shorea* of Dipterocarpaceae and *Koompassia* of Leguminosae. Larval host is uncertain.

DISTRIBUTION. Borneo (Sabah), Peninsular Malaysia-new record

REMARKS. This species was described from Borneo as a subspecies of *Usingerius rubens* from the Philippines based on a unique possibly female material (Zimmerman, 1946). The author distinguished them by the features of legs, namely, the fore femur provides with smaller tooth than that of *U. rubens* and the fore tibia hardly sinuate internally. However, he tentatively treated it

in subspecies level since the material is not sufficient to conclude that the differences are specifically distinct. We examined a number of materials collected from the Peninsular Malaysia identified with the Bornean sample. And we concluded that it is enough to treat the Malaysian representative as a distinct species since the features mentioned above are stable and some another differences are observed. According to the description given by Zimmerman, 1946, antennal club is somewhat longer than preceding six funicular segments in *U. rubens* whereas it is nearly as long as preceding five ones in *U. parvidens*. And, fore coxae are so close together that vestiture of two coxae touches in *U. rubens*, but the coxae are narrowly separated so as to untouched vestiture of coxae in *U. parvidens*.

Anthonomus (*Tachypterellus*) *nodulosus* (Marshall, 1926) (Figs. 16, 17, 22, 23, 26, 28, 29, 32-35)

Tachypterellus nodulosus Marshall. 1926, Treubia, 8: 343 (type locality: Java). — Schenkling & Marshall, 1934, Coleopt. Cat., 139, Anthonominae: 8. — Voss, 1935, Ent. Blätt., 31: 232. — Kalshoven, 1956, Ent. Bereich., 16: 83 (biology)

Anthonomus (*Anthonomus*) *nodulosus*: Burke, 1989, Ann. Ent. Soc. Amer., 82: 436 (record from Borneo: Sarawak, Singapore, Peninsular Malaysia (Pahang and Penang).

Anthonomus (*Tachypterellus*) *nodulosus*: Morimoto & Kojima, 1994, Spec. Bull. Essa Ent. Soc., 2: 294, 295 (in key).

Male and female. Length: 3.3-5.2 mm; width: 1.2-2.2 mm. See Marshall (1926) for description except integument dark reddish brown to black, antennae and tarsi, often tibiae and partly femora paler, lateral parts of metasternum densely with whitish or fulvous setiform scales. Rostrum similar to each other in both sexes, with antennae insertion at apical 1/3 (male) or a little behind apical 1/3 (female) of rostrum. Male terminalia as illustrated (figs. 30-33).

MATERIALS EXAMINED. PENINSULAR MALAYSIA: PAHANG, 1 female, Tanah Rata-G. Jasar, Cameron Highlands, 28. iii. 2002, H. & M. Kojima, 1 female, G. Perdah-G. Jasar, Cameron

Highlands, 9. iii. 2003, N. Takahashi, 1 female, Gunung Beremban, Cameron Highlands, 12. iii. 2003, N. Takahashi , 2 female, Path 3, Cameron Highlands, 15. vii. 2003, insecticide fogging of trees incl. *Castanopsis* sp. INDONESIA: W. JAVA, 1 female, Mt. Gede (1,400m), Tjibodas, 1923, Kalshoven (cotype)(Museum Leiden); 1 female, same data as the cotype. 1 male and 2 females, Cikaniki, G. Halimun Nat. Park, 19-24. viii. 1997, H. Kojima.

BIOLOGY. This species is known to be associated with *Pygeum* sp. of Rosaceae and the larvae are fruit borer of it (Kalshoven, 1956).

DISTRIBUTION. Java, Borneo (Sarawak), Singapore, Peninsular Malaysia, Penang.

REMARKS. This species was described based on the materials bred from the host. Thus, the description was based on the teneral specimens.

It is unusual that there are little sexual differences in the rostrum, and is easy to confuse the sexes. The cotype labeled by Marshall as male was actually female (see materials examined).

This species is somewhat similar to *A. collaris* from China and Taiwan in having the uneven pronotum, but is easily distinguishable from it by the tuberculate pronotum in *A. nodulosus* instead of the carinate pronotum in *A. collaris*, the sexual differences of rostrum evident as usual in *A. collaris*, and aedeagus narrower in *A. nodulosus* than that of *A. collaris* (Fig. 32, cf. Morimoto & Kojima, 1994, fig. M).

Anthonomus (*Tachypterellus*) *seminodulosus* sp. nov. (Figs. 18, 19, 24, 25, 27, 30, 31, 36-39)

Female. Length: 5.0 mm; width: 2.1 mm. Similar to *A. nodulosus*, but differs in the following points: rostrum scarcely curved, almost devoid of setiform scales; prothorax with tubercles not developed

as those of *A. nodulosus*; elytra with apical tubercle of 5th interval very small and hind tibiae unarmed at tip.

Male. Length: 4.5 mm; width: 2.0 mm. Resembles female except rostrum weakly arcuate, clothed with setiform scales except before antennal insertion, hind tibiae uncinate at tip. Terminalia as in Figs. 36-39, apophysis of aedeagus relatively shorter than that of *A. nodulosus*.

HOLOTYPE. Female. BORNEO: SABAH, Sepilok, Sandakan, 23.vii-4.viii. 1981, K. Morimoto (Type No. 0000, ELKU).

PARATYPE. 1 male. BORNEO: SABAH, Mt. Kinabalu Nat. Park, 30. iii. 1981, K. Sugiyama (KUM).
Non-paratypic material. 1 female. BORNEO: SABAH, Kepong, Keningau, 15. v. 1981, M. Tao (KUM, specimen damaged).

DISTRIBUTION. Borneo (Sabah)

ETYMOLOGY. The name is given because of the resemblance of this species to *A. nodulosus*.

REMARKS. As is shown in Figs. 30, 31, the femoral tooth varies between male and female, and need to evaluate whether it is sexual variation or not based on additional materials.
This species is very similar to *A. nodulosus* as is seen in the similarity of aedeagus structure, but the tubercles of pronotum and 5th elytral intervals near apex are less developed in *A. seminodulosus*.

Anthonomus (*Tachypterellus*) *humerulus* sp. nov. (Figs. 20, 21, 40-42)

FEMALE. Length: 5.9 mm; width: 3.0 mm. Dark reddish brown, middle and hind legs except median part of middle femora, venter and antennae reddish brown; derm with appressed setiform scales, reddish to yellowish brown in colour on most area, greyish white

to white partly, scales a little shorter on pronotum and elytra and denser behind middle of elytra, pronotum with three greyish stripes.

Head slightly constricted behind eyes; rostrum shorter than elytra (4:5); antennae inserted at apical 2/5 of rostrum, scape apart from eye, funicle with 1st segment slender, nearly as long as following 4 segments combined, 2nd about 1/3 of 1st, 3rd to 7th subequal in length, a little longer than broad, except 7th as long as broad, club a little shorter than preceding 6 segments combined.

Prothorax 1.25 times as broad as long; dorsum weakly and almost evenly convex behind subapical constriction, punctate and granulate. Scutellum prominent, highest before middle, anterior slope steep, less hairy, posterior slope with dense short hairs. Elytra 5/4 times as long as broad, separately lobate at base between scutellum and 4th stria, humeri sharply prominent laterally, dorsal outline almost flat for a short distance from base, then abruptly and very strongly convex; striae narrow and shallow, containing small separated punctures, punctures obscure behind middle; intervals uneven, finely rugulose and granulate, odd intervals slightly more convex than even ones, 1st interval raised from a short distance behind base to tubercles a little before middle, 3rd interval with a small callus at extreme base and with a very large long conical tubercles at middle, 5th interval with a small tubercle near apex. Legs as illustrated (fig. 42), fore femora elongate between base and teeth, tibiae uncinate in all pairs.

MALE. Unknown.

HOLOTYPE. Female. PENINSULAR MALAYSIA: PAHANG, Gunung Jasar, Cameron Highlands, 15-22.iv.1998, H. Yoshitake (Type No. 0000, ELKU).

DISTRIBUTION. Peninsular Malaysia.

ETYMOLOGY. The species is named after the prominent shoulders.

REMARKS. This species most resembles *A. similans* Voss from Java among congeners, but the rostrum is longer than the elytra and the elytral humeri are rounded in the latter.

DISCUSSION

Malaysian fauna of anthonomine weevils consist of four species in two genera: *Usingerius* and *Tachypterellus* of *Anthonomus*. *Usingerius* is interesting in the distribution among Anthonomini since they occur in the Pacific islands relatively remote from the continents. There are materials collected from Palau Is. and Truk Is. of the Caroline Islands in the easternmost area before us (Fig. 43). Occurrence of a species from the Peninsular Malaysia is the westernmost record of this genus.

Biology of *Usingerius* is little known except for some adult collecting records from *Pithecolobium* and *Cynometra* sp. of *U. maculates* (Zimmerman, 1942, 1948) both belonging to Leguminosae. Malaysian species were also collected on flower of *Saraca* sp. of Leguminosae, and by knockdown insecticide fogging of trees including *Koompasia excelsa* of Leguminosae. Thus, it is possible that *Usingerius* associates with the plant family Leguminosae as their host. Only a few anthonomine species have ever been known to be associated with the plant family in the Neotropical region (Burke, 1976).

One of the curious features observed in *Usingerius* is that the tarsal segment 2 is projected at the anterior angles (Fig. 8). The feature is usually not seen in Anthonomini as well as in other Curculionidae except for some Eugnomini, and this is a plesiomorphic state commonly seen in more primitive weevils as far as we know. Though the cleft and toothed tarsal claws, which are not widely divergent seen in *Usingerius* (Fig. 9), is a typical feature of most Anthonomini, it is necessary to review the position in detail.

As it can be expected from the geographical location, Malaysian species seems to be closer to *U. rubens* from the Philippines and undescribed species from Palau Is. than *U. maculates* from Guam and the Marianas.

Tachypterellus exhibits discontinuous distribution between North America and East Asia (Fig. 43). Two North American species are very close to each other (Burke, 1989), whereas the East Asian species are diverse morphologically, and unnamed species are known from Sulawesi, Borneo, the Philippines, Thailand and Vietnam (Kojima, in prep.). The known hosts of *Tachypterellus* species are *Prunus* species (*A. consors* and *A. quadrigibbus* from N. American and *A. dorsalis* from Japan) and *Pygeum* spp. (*A. nodulosus* from Java) of Rosaceae. North American species also associate with *Crataegus* sp., *Malus domestica* and *Amelanchier* sp. of Rosaceae, and *Cornus stolonifera* of Cornaceae (Burke, 1989). Their larvae develop in the fruit.

Tachypterellus may be divided into two species groups base on the features of the pronotum and the aedeagus as used by Morimoto & Kojima (1994) in the key as follows:

> One is a group, which has the pronotum evenly convex, without tubercles, and aedeagus not so tapered apically except the extreme apex, and inner sac with a pair of sclerites at middle. North American species (*A. quadrigibbus*, *A. consors*), Japanese species (*A. dorsalis*), Taiwanese species (*A. babai*) are belonging to this group. Though the structure of aedeagus is not investigated, Javanese species (*A. similans*) and one of the Malaysian species (*A. humerulus*) probably belongs to this group.
>
> The others have the uneven pronotum that is more or less tuberculate, aedeagus tapered apically, with simple inner sac. Chinese species (*A. collaris*) and two species treated in this paper: *A. nodulosus* from Java to the Peninsular Malaysia and *A. seminodulosus* from Borneo are included.

Habitats of both genera in Malaysia are quite different and that the *Usingerius* has been collected from the lowland forests, whereas *Tachypterellus* has been known from the mountainous forests. As *Usingerius* species also inhabited in the mangrove swamp in Guam occurs in the Pacific islands near the equator, the genus seems have adapted to the tropical environment.

Whereas species of *Tachypterellus* also occur in the temperate regions such as North America and Japan, and they seem to adapt to the temperate to warm temperate environment, and restricted its habitats to the mountainous areas in the tropics.

CATALOGUE OF THE ORIENTAL ANTHONOMINI

Genus *Anthonomus* Germar, 1817
Sungenus *Anthonomus* s. str.
Anthonomus albomaculatus Kôno, 1939
Ins. Mats.,13: 78
Distribution. Taiwan
Anthonomus albopunctatus Voss, 1941
Mitt. Münch. Ent. Ges., 31: 901
Distribution. S. China: Fukien
Anthonomus interpositus Voss, 1953
Ent. Blätt., 49: 60
Distribution. S. China: Fukien
Anthonomus okinawanus Kojima & Morimoto, 1994
Esakia, 34: 163
Distribution. Taiwan, Japan (Ryukyus)
Anthonomus sinicus Voss, 1958
Decheniana, Beihefte 5: 110
Distribution. S. China: Fukien
Anthonomus sorbi Germar, 1821
Mag. Ent., 4: 325
Distribution. Europe, S. China: Fukien
Subgenus *Tachypterellus* Fall & Cockerell, 1907
Anthonomus babai Morimoto & Kojima, 1994
Spec. Bull. Essa Ent. Soc., 2: 292
Distribution. Taiwan
Anthonomus collaris (Voss, 1953)
Tachypterellus collaris Voss, 1953
Ent. Blätt., 49: 59
Distribution. S. China: Fukien, Taiwan
Anthonomus humerulus sp. nov.
Distribution. Peninsular Malaysia
Anthonomus nodulosus (Marshall, 1926)

Tachypterellus nodulosus Marshall, 1926
Treubia, 8: 343
Distribution. Java, Borneo, Singapore, Peninsular Malaysia, Penang
Anthonomus seminodulosus sp. nov.
Distribution. Borneo
Anthonomus similans (Voss, 1935)
Tachypterellus similans Voss, 1935
Ent. Blätt., 31: 232
Distribution. Java
Genus *Usingerius* Zimmerman, 1942
Usingerius parvidens Zimmerman, 1946, stat. nov.
Usingerius rubens parvidens Zimmerman, 1946
Proc. Hawaii Ent. Soc., 12: 655
Distribution. Borneo, Peninsular Malaysia
Usingerius rubens Zimmerman, 1946
Proc. Hawaii Ent. Soc., 12: 653
Distribution. Philippines: Mindanao
Genus *Onycocnemis* Marshall, 1917
Onychocnemis careyae Marshall, 1917
Ann. Mag. Nat. Hist., (8)19: 194
Distribution. India
Genus *Sphincticraerus* Marseul, 1871
Sphincticraerus apionoides (Voss, 1944)
Aubeus apionoides Voss, 1944
Stett. Ent. Zeit., 105: 50
Distribution. Philippines: Palawan
Sphincticraerus himalayanus (Voss, 1944)
Aubeus himalayanus Voss, 1944
Stett. Ent. Zeit., 105: 49
Distribution. Indi

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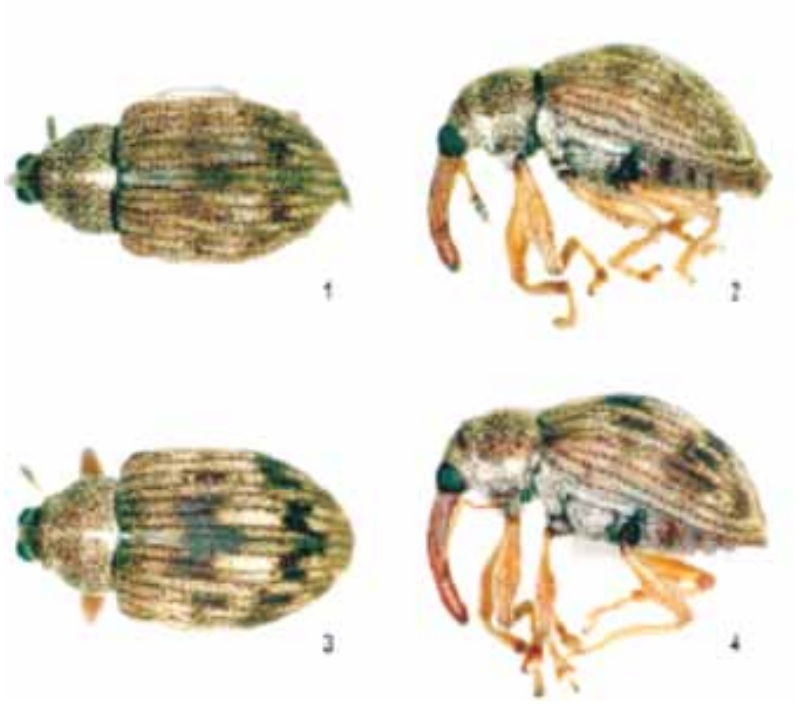
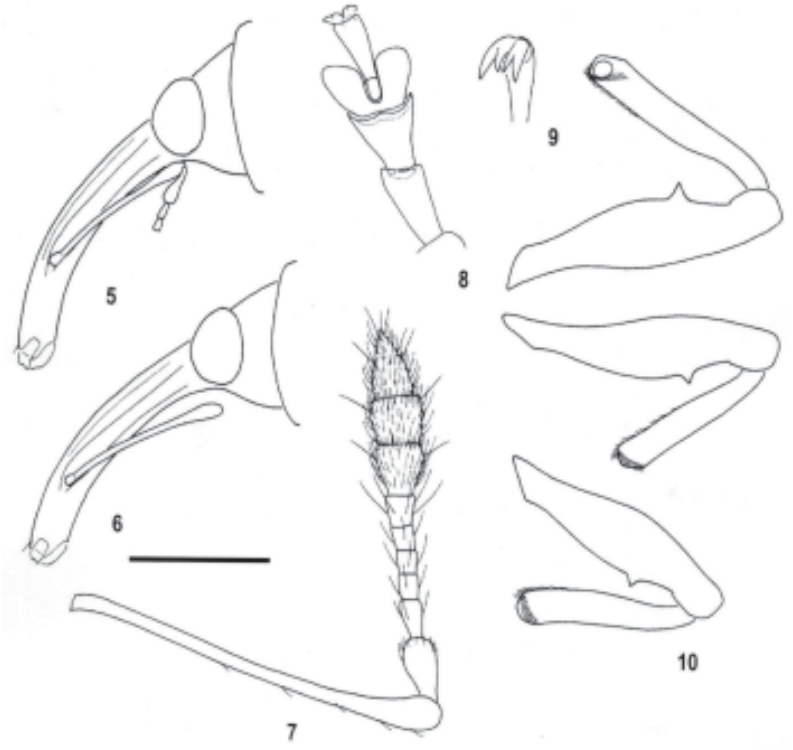
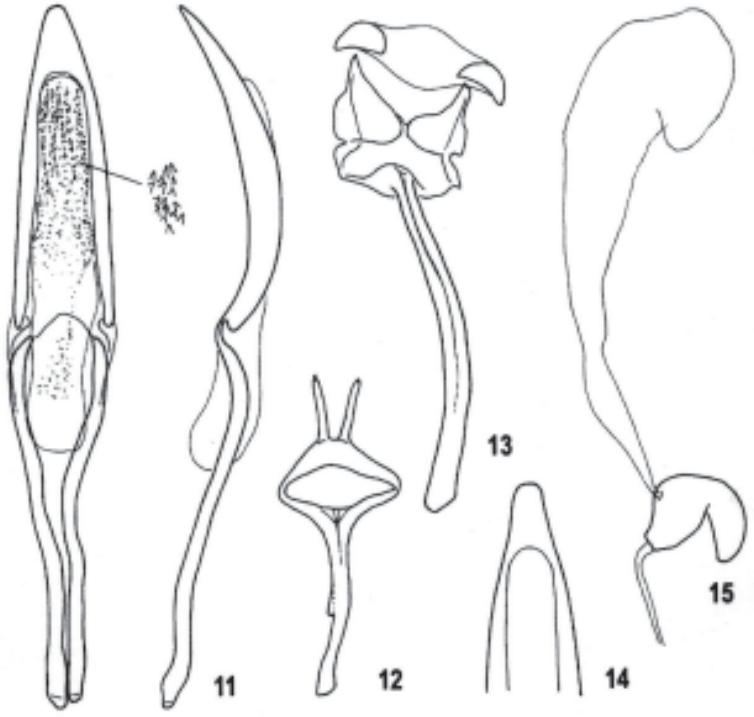


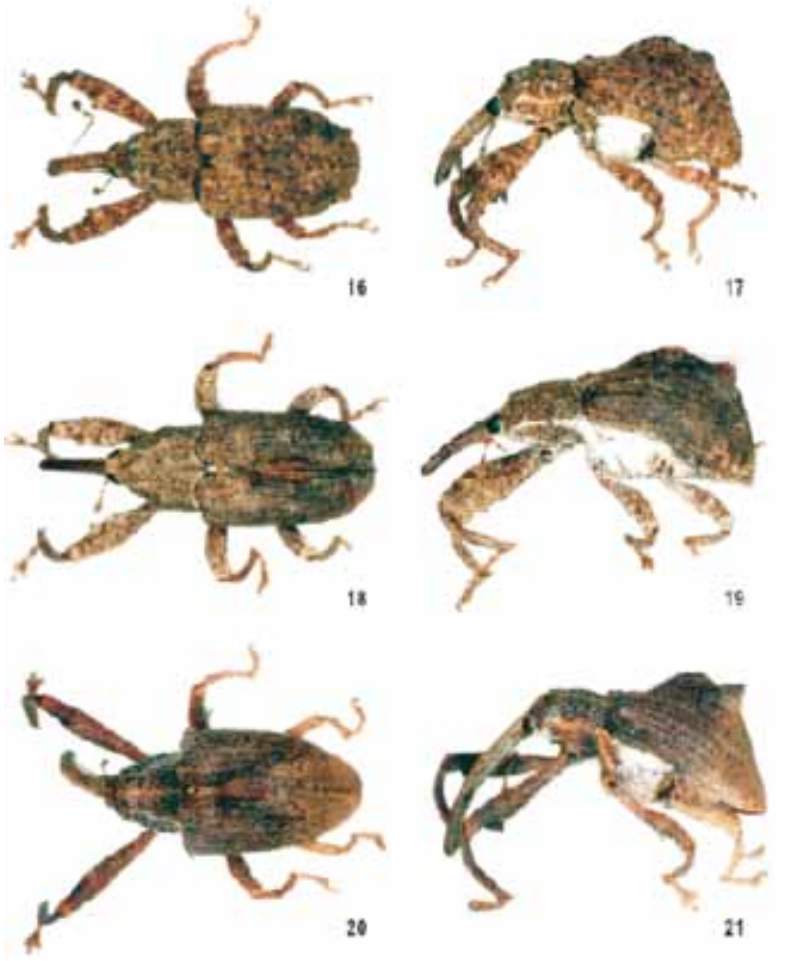
Figs. 1-4 Habitus photographs of *Usingerius parvidens* Zimmerman. 1, 2, male; 3, 4, female.



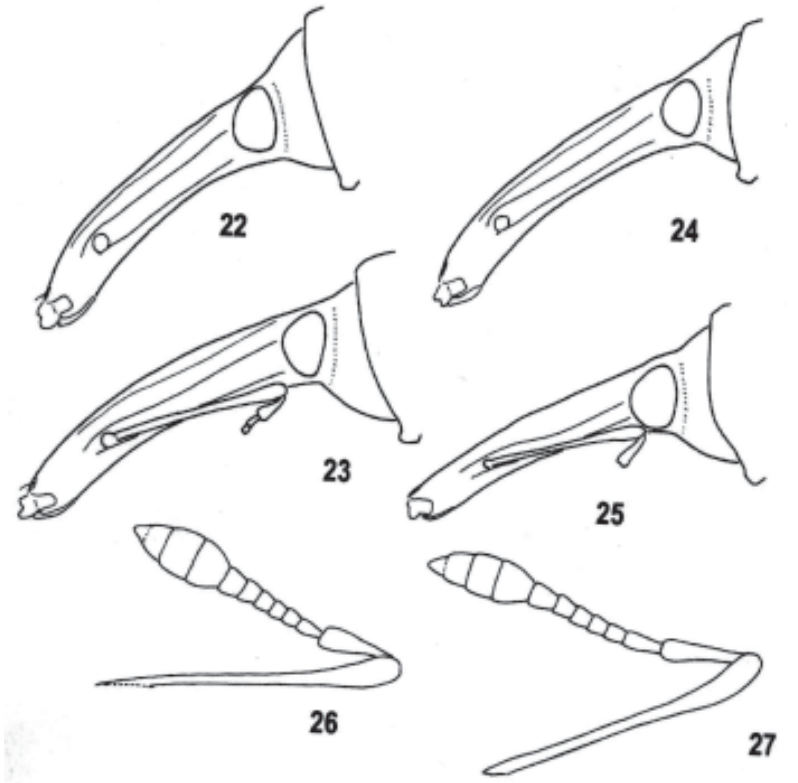
Figs. 5-10 Characters of *Usingerius parvidens* Zimmerman. 5, head, lateral, female; 6, ditto, male; 7, antenna; 8, fore tarsus; 9, fore claw; 10, femora and tibiae. Scale = 0.5 mm.



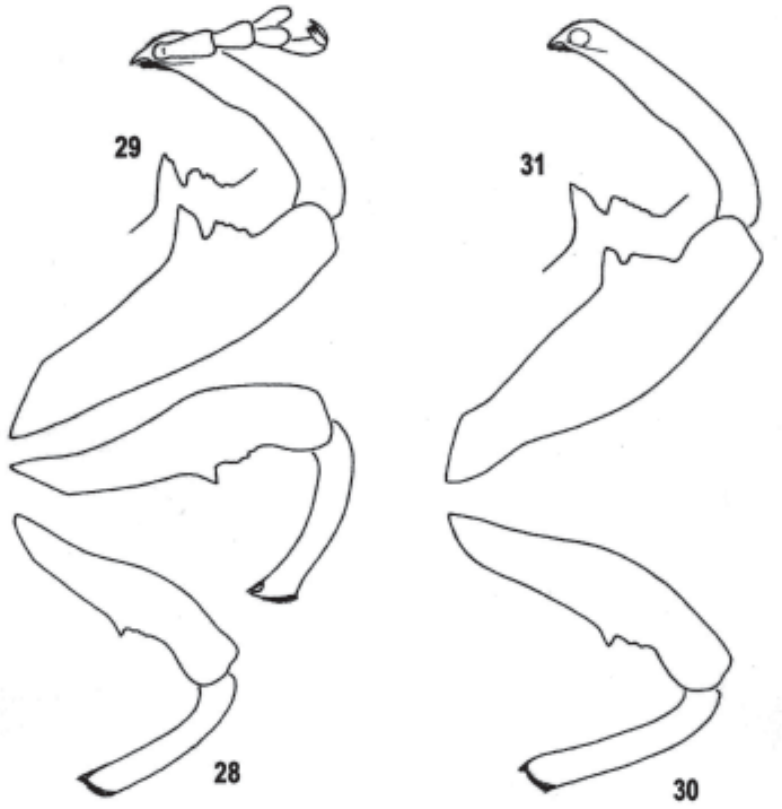
Figs. 11-15 Male and female terminalia of *Usingerius parvidens* Zimmerman. 11, aedeagus; 12, tegmen; 13, sternite 8 and spiculum gastrale, 14, apex of aedeagus; 15, spermatheca (11-13, 15: specimen from Perak; 14: specimen from Pahang). Scale = 0.5 mm.



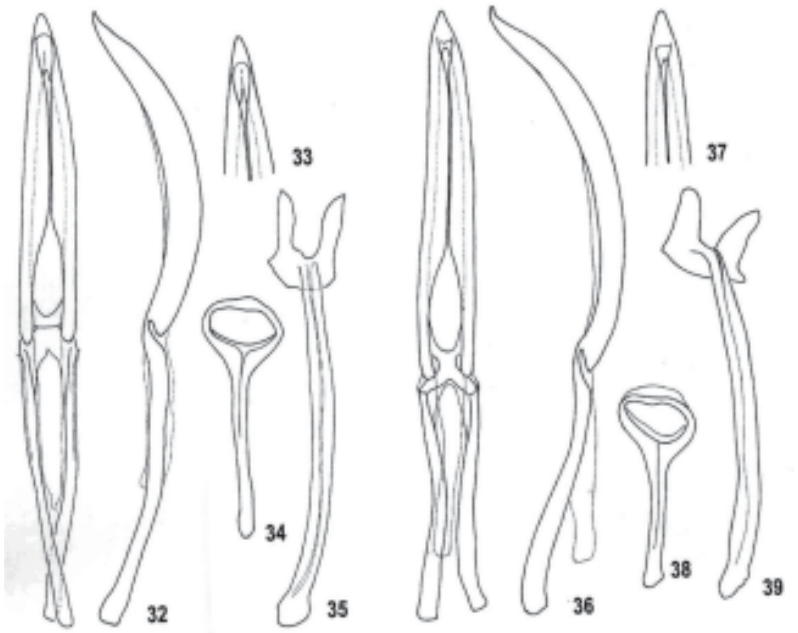
Figs. 16-21 Habitus photographs of *Anthonomus* (*Tachypterellus*) species. 16, 17, *A.* (*T.*) *nodulosus* Marshall, female; 18, 19, *A.* (*T.*) *seminodulosus* sp. nov., female; 20, 21, *A.* (*T.*) *humerulus* sp. nov., female.



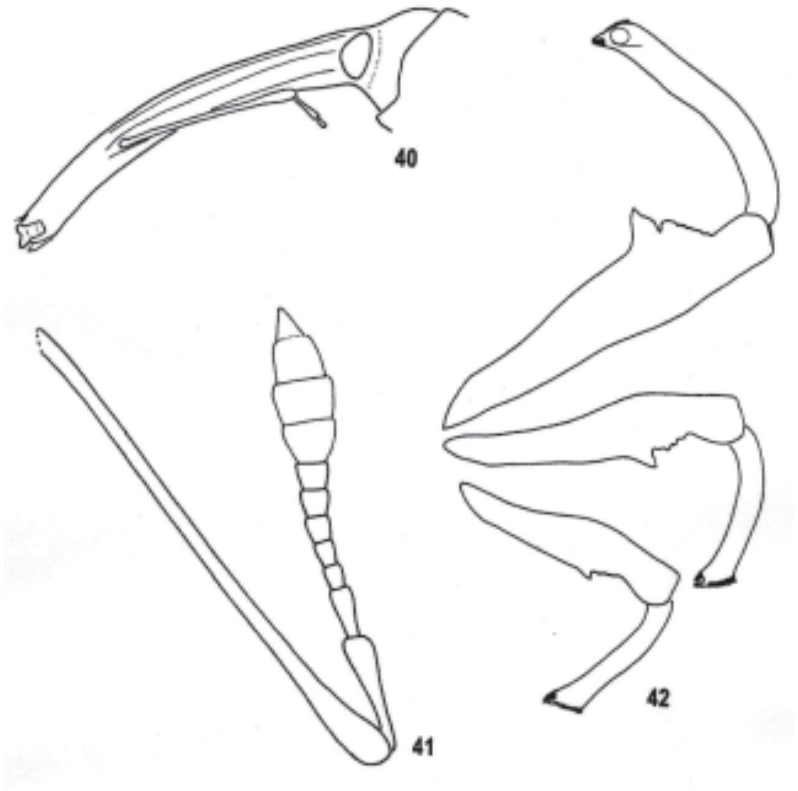
Figs. 22-27 Heads and antennae of *Anthonomus* (*Tachypterellus*) species. 22-25, head, lateral; 26, 27, antennae (22, 23, 26: *A.* (*T.*) *nodulosus* Marshall; 24, 25, 27: *A.* (*T.*) *seminodulosus* sp. nov.). Scale = 0.5 mm.



Figs. 28-30 Legs of *Anthonomus* (*Tachypterellus*) species. 28, 29, *A.* (*T.*) *nodulosus* Marshall (28: female; 29: another female); 30, 31, *A.* (*T.*) *seminodulosus* sp. nov. (30: female; 31: male).



Figs. 32-39 Male terminalia of *Anthonomus* (*Tachypterellus*) species. 32, 36, aedeagus; 33, 37, apex of aedeagus; 34, 38, tegmen; 35, 39: spiculum gastrale (32-35: *A.* (*T.*) *nodulosus* Marshall; 36-39: *A.* (*T.*) *seminodulosus* sp. nov.). Scale = 0.5 mm.



Figs. 40-42 Characters of *Anthonomus* (*Tachypterellus*) *humerulus* sp. nov., female. 40, head, lateral; 41, antenna; 42, femora and tibiae. Scale = 0.5 mm