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Catalog and Revised Classification of the Gastrozonini (Diptera: Tephritidae: Dacinae)

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ABSTRACT

A catalog of Gastrozonini is presented based on the recent world catalog of Tephritidae and subsequent taxonomic and nomenclatural changes. The Gastrozonini are defined taxonomically and biologically, primarily as the Poaceae-infesting Tephritidae other than Acanthonevrini. Although morphological synapomorphies are scant, the group is probably a monophyletic unit based primarily on host plant records and a few other potential synapomorphies such as characters of the antenna, wing and terminalia. Larvae of the gastrozonine species that we studied have a ridge on the ventral tubercle of the caudal segment, confirming the relationship of Gastrozonini with Dacini and Ceratitidini. A key to all included genera of Gastrozonini is provided, and new taxonomic and nomenclatural changes introduced in the catalog are explained. The current classification comprises 27

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genera (of which about half have confirmed host records) and 137 species, 14 of which are Afrotropical and probably comprise a monophyletic subgroup. The remaining group of genera extends from the southeastern part of the Palaearctic Region through the entire Oriental Region into the Australasian Region, as far south as Australia, but is predominantly Oriental. The following new combinations are made: *Acroceratitis aberrata* Hardy, *Acroceratitis adnata* Hardy, *Chelyophora maai* Chen, *Ceratitoides namtamai* Hancock, and *Ceratitoides sikhimensis* Hancock are transferred from *Ceratitoides* to *Pardalaspinus*, and *Carpophthoromyia cinereofasciata* Meijere is transferred from *Ceratitoides* to *Proanoplomus*. *Acrotaeniostola longicauda* Wang, previously synonymized under *Acrotaeniostola morosa* Hering, is reinstated from synonymy.

INTRODUCTION

The motivation to prepare this publication comes from our recently growing interest in the Poaceae (Gramineae)-breeding fruit flies (Tephritidae: Dacinae: Gastrozonini), often called grass-breeding or bamboo-shoot fruit flies (Wang, 1998; Hancock, 1999; Hancock and Drew, 1999). Although confirmed published host records are available for a relatively small number of species (Allwood et al., 1999), all the species of this group probably breed in Poaceae. In the Oriental Region, where the great majority of the species occurs, existing host records indicate that most or all of the species are bamboo breeders.

Almost nothing is known about the biology of the Gastrozonini, apart from the confirmed and suspected host records (Hancock and Drew, 1999) and an isolated description of the behavior of one species, *Cyrtostola limbata* (Hendel) (Kovac and Azarae, 1994). The bulk of the published information on the group is taxonomic, but the taxonomy of the group is still in flux, and even the taxonomic limits of the group are uncertain. For example, Hancock (1999), when discussing the relatively few Afrotropical taxa together with some of the taxa from the Oriental Region [an artificial combined group] noted: "The resemblance of *Bistrispinaria* [African (our addition)] to the *Anoplomus* complex ['Oriental' (our addition)] suggests that all may breed in grasses and thus all belong in tribe Gastrozonini". However, he has not applied this conclusion and, in two papers that appeared in the same issue, retained the *Anoplomus* group (including the Afrotropical taxa) in the Ceratitidini (Hancock, 1999), separate from the Gastrozonini (Hancock and Drew, 1999).

As with many other groups of Tephritidae, the lack of comprehensive phylogenetic analysis and apparent homoplasy in conventional taxonomic characters obscures the true taxonomic relationships of this group. Much more research is still required, especially biological and molecular, as well as a comprehensive study of the male and female terminalia, before a satisfactory classification can be achieved. Nevertheless, the information gathered recently, especially in the publications cited above and also through the unpublished results of our work in Asia and Africa, indicates that the group treated in the present publication is most probably monophyletic.

Gastrozonini are not the only fruit fly group breeding in Poaceae. A group of genera referable to the Acanthonevrini and centered around *Acanthonevra* Macquart, *Ptilona* Wulp and *Felderimyia* Hendel, is also associated with bamboo in the Oriental Region and adjacent areas of the Palaearctic and Australasian Regions, although their association is probably primarily with dead or decaying bamboo. The taxonomic and phylogenetic relationships of the Acanthonevrini and Gastrozonini are not fully understood, but they are currently classified in

different subfamilies and do not appear to be closely related (Korneyev, 1999). Moreover, there is no evidence supporting an assumption that the bamboo breeding Acanthonevrini form a monophyletic group, and their relationships with the rest of the Acanthonevrini (some of which are known to have other host plant associations) are not clear.

Korneyev (1999) included the Gastrozonini, Ceratitidini and Dacini in the subfamily Dacinae. Norrbom et al. (1999) gave these groups a lower rank: Gastrozonina, Ceratitidina and Dacina, together comprising the tribe Dacini. Here, we prefer to follow Korneyev (1999) because his classification was based on a cladistic analysis. Whatever the nominal rank of these more or less coherent groups is, the relationships among them are still unresolved.

The monophyly of the subfamily Dacinae is supported by morphological and biochemical data, although some characters have not been studied thoroughly in the Gastrozonini (Korneyev, 1999). Hancock (1986) and Foote et al. (1993) suggested that the Dacinae are monophyletic based on the shape of the posterodistal lobe of cell bcu (often narrower at base than medially), spermathecae number reduced to two (considered a synapomorphy of Dacini + Tephritinae by Hancock, 1986), and surstyli shape. Korneyev (1999) also considered the large proctiger of the male to be a synapomorphy of the subfamily. Species of Dacini and Ceratitidini whose larvae have been described (no larvae of Gastrozonini have been described yet) have a ridge across the large tubercle ventral to the posterior spiracle on the caudal segment, an apomorphic state not reported in any other Tephritidae (Carroll, 1992). Our unpublished data on ten species of Gastrozonini indicate that this character is also common to this tribe, confirming its relationship to the Ceratitidini and Dacini. Kitto (1983) suggested the close relationship of the few Dacini and Ceratitidini included in his immunological study (no Gastrozonini were studied), and the four species (2 Dacini, 1 Ceratitidini, 1 Gastrozonini) included by Han and McPheron (1997) were grouped together in their neighbor-joining tree.

Relationships within the Dacinae have not been rigorously analyzed. The Dacini and Ceratitidini each appear to be monophyletic, but the Gastrozonini were previously considered to possibly be paraphyletic (Norrbom et al., 1999; Korneyev, 1999). We now consider the group to be monophyletic (see diagnosis), although some adjustments (e.g., the inclusion of additional taxa) may still be necessary.

All this means that diagnosing the Gastrozonini is difficult, although we have nevertheless attempted to do so in the short diagnosis of the group that follows. The best diagnostic character of the Gastrozonini is their association with Poaceae. Combining the confirmed published records (Hancock and Drew, 1999) with our unpublished records has resulted in a host list for 13 of the 27 genera (see below). Most Gastrozonini genera, as presently conceived, appear to be homogenous units, and the host consistency observed to date within the genera for which host records are available for multiple species suggests that host plant association is constant within genera. Several apomorphic or potentially apomorphic morphological characters (some are of uncertain polarity) also support the monophyly of the group, although not all are consistently present. These include: 1st flagellomere often with distinctly raised dorsoapical point; arista almost always plumose; setulae on pedicel long, dense and dark; wing pattern almost always banded, usually more or less *Ceratitis*-like; male proctiger enlarged, covering entire epandrium in ventral view; and aculeus usually very broad, flattened, strongly sclerotized and pointed or relatively elongate, narrow and pointed.

All gastrozonine genera conform to the diagnosis below. Those without host records are either similar to genera with host records or, at least, exhibit some of the crucial diagnostic traits, such as the shape of the antenna and aculeus. As stated earlier, most of these genera, even

if not definitively included in the Gastrozonini by Hancock (1999), were implied by him to belong there. The only debate concerns the wasp mimic, *Ichneumonopsis* Hardy, which was included by Hancock (1986) and Drew and Hancock (1994) in the Dacina (a large taxon of wasp-like flies). In addition to this shared mimicry (Freidberg, unpublished observations), this genus also shares with the Dacina reduced chaetotaxy, but it does not share with this group other, more important, synapomorphies, such as those of the wing venation (Radhakrishnan, 2000) and preabdomen, and therefore we continue to classify it in the Gastrozonini. Reduced chaetotaxy has occurred multiple times in tephritid evolution, including other wasp mimics, such as the Adramini, *Toxotrypana* Gerstaecker, and some *Pseudophorellia* Lima (Norrbom, 2006, this volume).

Gastrozonini that breed in bamboo are attracted to damaged but living bamboo plants and probably develop, at least partly, in live tissues. As such they should be considered as actual or potential pests of bamboo, a commodity of great importance in southeast Asia. As their biology is just beginning to be carefully explored, further study is necessary before the damage they inflict to bamboo, or other Poaceae, can be assessed. Many species have been recorded to be attracted to freshly cut bamboo (Hancock and Drew, 1999), and this behavior has been suggested as diagnostic for Gastrozonini. Our own observations generally support this notion. However, we would urge scientists to be cautious and use this behavioral trait only as an indication to possible taxonomic assignments of Tephritidae attracted to bamboo, since we have observed other tephritids, such as the distantly related *Adrama* Walker, attracted to freshly cut bamboo.

The Gastrozonini are primarily tropical, with the largest number of species in the Oriental Region and a few in the Afrotropical, southeastern Palaearctic and Australasian Regions. The Palaearctic and Australasian species show close affinities to the Oriental fauna, whereas the four Afrotropical genera are very similar to each other and may comprise a separate monophyletic subgroup. However, the latter hypothesis should be tested.

The purpose of this publication is to compile in one source the previously scattered nomenclatural and taxonomic information on the Gastrozonini subsequent to the world catalog and database of the Tephritidae (Norrbom et al., 1999; Norrbom, 2004), and provide a single key to all of the known genera. We have entered taxonomic and nomenclatural changes from two kinds of sources: 1) recent publications not available at the time the world catalog was produced (i.e., ranging between 1999-2004); and 2) changes proposed by us herein, that we have kept to a minimum. Hence, almost all the many changes suggested by Hancock since 1999 (Hancock, 1999; Hancock and Drew, 1999) have been incorporated without critical checking, and in only two cases did we introduce new changes. These latter changes are explained in a special section following the catalog.

The format of this catalog is similar to that of the world catalog, with mostly the same abbreviations and acronyms. Each genus entry contains a header with the name of the valid genus in bold, and for each name (valid name, synonyms, homonyms, misspellings, misidentifications) pertaining to that genus the following information: Original name, author, year, page number, type-species, kind of designation, and as applicable, note information. Each species entry contains a header with the name of the valid species in bold, and for each name (valid name, synonyms, homonyms, misspellings, misidentifications) pertaining to that species the following information: Original combination, author, year, page number, type data (kind of type, sex of type, depository, type locality), and as applicable, note information. The

distribution is also given under the valid name. A host catalog covering most Gastrozonini was published by Hancock and Drew (1999), and it is not repeated here. The genera that have been positively associated with Poaceae (i.e., at least one species of a genus has a confirmed rearing record; an asterisk (*) denotes new rearing records) are *Acroceratitis, Acrotaeniostola, Bistrispinaria, *Carpophthorella, Chaetellipsis, Cyrtostola, *Enicoptera, Gastrozona, Paragastrozona, Paraxarnuta, Phaeospilodes, Taeniostola, Xanthorrhachis*, and there are indications for such an association for several other genera.

A key to the genera of Gastrozonini is provided to help identify the genera according to the new classification proposed here. This key essentially combines the two keys to genera of Hancock (1999) and Hancock and Drew (1999), respectively, with necessary modifications and adding to them *Ichneumonopsis*. We have tested about 65 species against the key, representing the great majority of genera, and consequently made some minor adjustments, including style, terminology and rearrangement. Representatives of only *Chelyophora, Phaeospila* and *Sinanoplomus* have not been tested. During the process, we have encountered some difficulties, primarily caused by the vague definition and limits of some genera. A particularly difficult area of the key is the group of genera clustered around *Gastrozona* (couplets 13-18), and a particularly interesting section is formed by the African taxa. Because the African taxa are placed for the first time in context with all 'Asian' Gastrozonini, and because no cladistic analysis is available for the Gastrozonini, we have refrained from introducing drastic changes to Hancock's (1999) key. However, the perspective we have gained during the process indicated that a) the African taxa are very similar to each other and probably form a monophyletic group; b) this group may not necessarily be the sister group of all the Oriental Gastrozonini but a subgroup thereof; and c) the concepts of the four currently recognized African genera are not significantly different, and all African species should probably be united under one genus (*Bistrispinaria*), which nevertheless lacks good diagnostic characters at present. This would better be done as part of a future phylogenetic analysis of the Gastrozonini. Hancock's keys to species (loc. cit.) generally work well, although for better results in certain genera (e.g., *Acrotaeniostola*), Wang's (1998) keys should also be consulted.

Terminology follows McAlpine (1981) and White et al. (1999). In the wing pattern we used the term *transverse* for bands that are oriented more or less perpendicular to the longitudinal axis of the wing, *longitudinal* for bands parallel to this axis, and *oblique* for transverse bands that are diagonal to this axis.

List of abbreviations used in the catalog (slightly modified from Thompson, 1999)

A	—	adult
B	—	both sexes
E., e.	—	east, eastern
Emend.	—	emendation
F	—	female
ft.	—	feet
HT	—	holotype
I., Is.	—	island, islands
Incosp.	—	incorrect original spelling
LT	—	lectotype
M	—	male
m	—	meter(s)

mi.	—	mile(s)
Misid.	—	misidentification
Missp.	—	misspelling
MO	—	monotypy
Mt., Mts.	—	mount or mountain(s)
N. N.	—	new name
N., n.	—	north, northern
N. Comb.	—	new combination
NE., ne.	—	northeast, northeastern
nr.	—	near
NW., nw.	—	northwest, northwestern
OD	—	original designation
R.	—	river
S., s.	—	south, southern
SE., se.	—	southeast, southeastern
ssp.	—	subspecies
ST	—	syntype
T	—	type
W., w.	—	west, western

List of collections housing type material and their acronyms

Baker — C.F. Baker, personal collection. (The relevant specimens are actually in MCSNM)
BAUC — Beijing Agricultural University, Beijing
BBM — Bernice P. Bishop Museum, Honolulu
BMNH — The Natural History Museum, London
CAS — California Academy of Sciences, San Francisco
DEI — Deutsches Entomologisches Institut, Müncheberg, Germany (formerly: Eberswalde)
HUS — Entomological Institute, Hokkaido University, Sapporo, Japan
IZAS — Institute of Zoology, Academia Sinica, Beijing
KUB — Kasetsart University, Bangkok, Thailand
MCSNG — Museo Civico di Storia Naturale, Genoa, Italy
MCSNM — Museo Civico di Storia Naturale, Milan
MNHNP — Museum National d'Histoire Naturelle, Paris
MNM — Magyar Termeszettudomanyi Muzeum Allattara, (Hungarian Natural History Museum), Budapest
MRAC — Musée Royal de l'Afrique Centrale, Tervuren, Belgium
NMBZ — Natural History Museum, Bulawayo, Zimbabwe
NMW — Naturhistorisches Museum Wien
NRS — Naturhistoriska Riksmuseet, Stockholm
NSWA — New South Wales Agricultural Scientific Collection Trust, Rydalmere, NSW, Australia
NTU — National Taiwan University, Taipei
PAN — Polish Academy of Science, Museum of the Institute of Zoology, Warsaw
PUCP — Punjab University, Chandigarh, Punjab, India
RNH — Nationaal Natuurhistorische Museum, Leiden, Netherlands

SANC — South African National Collection of Insects, Pretoria
UOPJ — Entomological Laboratory, University of Osaka, Osaka, Japan
USNM — United States National Museum of Natural History, Washington, DC.
UZMH — Zoological Museum, Finnish Museum of Natural History, University of Helsinki, Helsinki
ZFMK — Zoologisches Forschungsinstitut und Museum "Alexander Koenig", Bonn, Germany
ZMAN — Zoologisch Museum, Universiteit van Amsterdam, Amsterdam
ZMHU — Museum für Naturkunde der Humboldt Universität zu Berlin, Berlin
ZSI — Zoological Survey of India, National Zoological Collection, Calcutta, India
ZSZMH — Zoologisches Staatsinstitut und Zoologisches Museum, Hamburg, Germany

Additional material that was used by us for the preparation of this publication is deposited in the Senckenberg Museum, Frankfurt/Main, Germany (SMF) and Zoological Museum, Tel Aviv University, Tel Aviv, Israel (TAUI).

DIAGNOSIS OF GASTROZONINI

No single feature can distinguish all Gastrozonini. Hence this detailed diagnosis (aranged in the format of a description) contains both plesiomorphic and apomorphic characters (marked by a (= apomorphy) or p (= plesiomorphy) where their polarity appears obvious). Of these, the most important appears to be the association with Poaceae, and more specifically with bamboo (Asian species) or non-bamboo hosts (African species). It should be noted that character polarities were tentatively assigned based on comparison with other Dacinae and other Tephritidae. The important morphological characters are as follows.

Head. Antenna: 1st flagellomere often with distinctly raised dorsoapical point (a), or the meeting point of the straight dorsal margin with the rounded apical edge sharp, or 1st flagellomere tapered, ending in distal point. In ten genera (*Carpophthorella, Chaetellipsis, Cyrtostola, Dietheria, Enicoptera, Gastrozona, Ichneumonopsis, Paragastrozona, Pardalaspinus, Proanoplomus*) 1st flagellomere more or less rounded distally. Arista never bare, almost always plumose (polarity uncertain), with long rays, and plumosity usually exceeding or equal to antennal width. Only rarely rays short, and arista pectinate (*Chaetellipsis*), or pubescent (*Paragastrozona*). Setulae on pedicel long, dense and dark in all African species and in many, but not all Asian species (a?). *Chaetotaxy*: Full complement of setae usually present (p), and setae usually "strong" (long and thick) and dark. Setae on anterior part of gena occasionally strongly developed as major setae (e.g., *Acrotaeniostola*). Some major setae, e.g., ocellar or frontal setae, sometimes reduced or lacking.

Thorax. Scutellum usually flat, sometimes convex, always setulose. Color pattern, particularly on mesonotum, often composed of contrasting pale and dark areas, obscured or not by areas of microtrichia and pale or dark setulae. *Chaetotaxy*: Usually full complement of "strong" setae present (p), but some major setae occasionally lacking. The usual and maximum number of scutellar setae is 2, but in three genera only 1 is present.

Legs. No overt features.

Wing. *Venation*: Usually similar to Ceratitidini and Dacini in relatively long and basally constricted posterodistal lobe of cell bcu (although lobe shorter than in Dacini), but different

from most Dacini in narrow cell bm (p). Venation rarely of unusual form (*Enicoptera* - a). *Pattern*: Almost always banded, usually without, sometimes with *Ceratitis*-like black subbasal streaks, with various subtypes exhibiting various combinations of transverse, longitudinal, and oblique bands. Pattern sometimes reduced to spots that seem to conform to the above-mentioned subtypes. Wing pattern types of rare occurrence (a) are: merely longitudinal bands, including dimidiate pattern (e.g., *Xanthorrachis, Ichneumonopsis*); reticulate or reticulate-banded (e.g., *Phaeospilodes*); and the complicated and colorful pattern of males of some *Chaetellipsis* species.

Abdomen. Often with distinct pattern of microtrichia, primarily on tergites 3 and 5. Male tergite 2 often greatly enlarged, covering lateral margin of tergite 3 and with large specialized areas laterally (a). Male proctiger enlarged, covering entire epandrium in ventral view (a). Female with two spermathecae (p; possible synapomorphy of Dacinae). Female aculeus of various shapes (a). In *Gastrozona*, *Chaetellipsis*, and a few other genera the aculeus is relatively elongate and narrow, pointed apically, and often with preapical steps and occasionally serration (polarity uncertain). In *Acrotaeniostola, Acroceratitis*, and many other genera, the aculeus is relatively broad and flattened, usually strongly sclerotized and pointed, but occasionally rounded apically (a; this is the dominant shape in Gastrozonini, and it is relatively little varied). In *Dietheria* the tip of the aculeus is bifid (a).

KEY TO THE GENERA OF GASTROZONINI

1. Extremely wasp-like species, with petiolate abdomen, spinose forefemur and dimidiate wing pattern (anterior half of wing yellow, remaining part hyaline), chaetotaxy reduced: one setula-like frontal seta, one small orbital seta and 1 scutellar seta present; ocellar, dorsocentral, acrostichal, intra-alar, postpronotal and pleural setae, except one anepisternal seta, lacking ..... ***Ichneumonopsis***

–. Not extremely wasp-like species, abdomen not petiolate, forefemur not spinose, wing with different pattern, chaetotaxy usually not reduced, if reduced, then only one or two of above-mentioned setae lacking **2**

2. Vein R_{2+3} bowed anteriorly towards vein R_1 near apex, meeting vein R_1 or, sometimes, split into vein R_2 and vein R_3, thus forming small, peculiar cell just beyond pterostigma; vein M sinuous, bowed anteriorly beyond apex of cell dm and almost meeting vein R_{4+5} at wing apex; pterostigma elongate, ending considerably beyond mid-length of wing and opposite crossvein DM-Cu; crossvein DM-Cu strongly oblique anterodistally ..... ***Enicoptera***

–. Veins R_{2+3} and M not sinuous; pterostigma not elongate ending at about mid-length of wing and approximately opposite crossvein R-M; crossvein DM-Cu not strongly oblique anterodistally **3**

3. Head with 4–16 pairs of frontal setae or, in some males, frontal and orbital setae absent; wing without oblique brown band from vein A_1+Cu_2 across crossvein R-M to costa; anepisternum with whitish band across dorsal part from postpronotal lobe to wing base; sexes often strongly dimorphic in wing pattern or color **4**

–. Head usually with 1-3 pairs of frontal setae, if with 4-5 (pairs) then wing with partial or complete oblique brown band from vein A_1+Cu_2 across crossvein R-M to costa; if this band reduced to isolated spots then anepisternum almost entirely yellowish, sexes at most weakly dimorphic in wing pattern or color **5**

4. Male with frontal and orbital setae present; female with oblique brown band in posterior part of wing, from vein A_1+Cu_2 across distal part of cell dm reaching or almost reaching subapical band ..... ***Carpophthorella***
–. Male with frontal and orbital setae absent; female without oblique brown band from vein A_1+Cu_2 to subapical band, but with isolated band over crossvein DM-Cu to posterior wing margin..... ***Chaetellipsis***
5. Wing with 2 or 3 yellow longitudinal bands, along costa, vein M and usually vein Cu_1; ocellar setae usually vestigial; male tergite 2 enlarged, with large unusually textured area laterally (secretional? stridulatory?), covered only by dense and erect minute setulae, unlike other abdominal setulae **6**
–. Wing pattern different, dark with hyaline spots and indentations or with transverse or oblique yellow to brown bands, or reduced to 1-2 transverse bands plus more or less isolated small spots; ocellar setae usually well-developed; male tergite 2 enlarged or not, with or without such specialized area **7**
6. Head nearly quadrate, with frons almost horizontal; body less robust, with male abdomen about 1.5 times as long as wide ..... ***Galbifascia***
–. Head distinctly higher than long, with frons sloping; body more robust, with male abdomen about as long as wide ..... ***Xanthorrachis***
7. Scutum, scutellum and abdomen entirely and densely covered by short black setulae, usually strongly contrasted with paler background (some scutal setulae occasionally appearing pale in certain viewing angles) and with about 15-20 irregular rows of setulae between acrostichal setae; ventral margin of scutellum extensively setulose; wing pattern reduced, comprising broad and complete, nearly transverse band over pterostigma and crossvein R-M, and more or less complete, converging band over crossvein DM-Cu, as well as few small spots and occasionally yellowish base of wing ..... ***Paraxarnuta***
–. Scutum, scutellum and abdomen not so densely black setulose, setulae usually not strongly contrasted with background, usually pale, if black then no more than 12 rows of setulae between acrostichal setae, and wing pattern not reduced **8**
8. Wing pattern comprising large preapical brown area posterodistally (usually covering both crossveins R-M and DM-Cu, sometimes only DM-Cu), with long costal band over pterostigma and most or all cell r_1 and occasionally with short band along central part of cell dm, both attached to main dark area, and with narrow dark crescentic apical spot partly (male) or entirely (female) separated from main dark area by crescentic hyaline gap; crossvein DM-Cu anterodistally oblique; lacking ocellar, postocellar, postpronotal, presutural and dorsocentral setae ..... ***Rhaibophleps***
–. Wing pattern and venation different, wing without such longitudinal bands; chaetotaxy more complete **9**
9. Wing banded, with all bands generally parallel and oblique, except sometimes (in *Taeniostola*) on apical third of wing, where 2-3 bands may converge **10**
–. Wing banded or not, if banded then bands on apical half to two-thirds of wing either converging or generally parallel and transverse, usually including four bands arranged more or less in the form of a small “v” within a large “v”; wing pattern sometimes reticulate or reticulate-banded **12**
10. Chaetotaxy: 1 scutellar seta, 1 frontal seta, 1 orbital seta ..... ***Dietheria***
–. Chaetotaxy: 2 scutellar setae, 2-5 frontal setae, 2 orbital setae **11**

11. First flagellomere distinctly pointed dorsoapically; midtibia with 2 subequal apical spines; postpronotal lobe and scutum with isolated black spots ..... ***Spilocosmia***
–. First flagellomere indistinctly pointed or rounded apically; midtibia with one apical spine; postpronotal lobe and scutum with or without black vittae, but without black spots ..... ***Taeniostola***
12. African; probably not associated with bamboo **13**
–. Asian; known or suspected to be associated with bamboo **16**
13. Wing with 2-5 long costal spines at end of vein Sc and distinct dark spots and streaks at base, including elongate streak in cell c; scutellum mostly black with distinct longitudinal medial yellow spot at base, pair of basolateral yellow lines and usually pair of subapical yellow lines ..... ***Bistrispinaria***
–. Wing usually with at most one long costal spine at end of vein Sc and indistinct spots and streaks at base, usually without elongate streak in cell c; scutellum entirely yellow, yellow to white with one or three black apical or subapical spots, or mostly or entirely black, without distinct longitudinal medial yellow spot at base **14**
14. Wing with transverse band from cell sc, across central part of cell br and basal half of cell dm to hind margin, united at vein M and apex of pterostigma with band along crossveins DM-Cu and R-M ..... ***Ceratitoides***
–. Wing with oblique band from beyond cell sc, across crossvein R-M and middle of cell dm, leaving distal half of pterostigma and basal part of cell r_1 pale or hyaline and usually free from band along crossvein DM-Cu; oblique band usually entirely disconnected from basal area of pattern **15**
15. Scutum yellowish, with pair of black spots posterolaterally in both sexes; scutellum with apical spot usually small, rounded, restricted to area between apical setae; abdomen yellow to brown, at most with brownish bands; mediotergite yellow to red brown..... ***Leucotaeniella***
–. Scutum brownish black to black, if mostly yellow in male then black areas present dorsocentrally in posterior part, scutellum with apical spot large, quadrate, usually about half as long as scutellum, sometimes almost as large as scutellum, and abdomen with black transverse bands; mediotergite shiny blackish brown to black ..... ***Clinotaenia***
16. Wing with dark claw-like marginal band, extending from level of crossvein H, where it occupies entire wing width, covering about half of anal lobe, to wing tip, including crossvein R-M, and with two converging and more or less well-developed subapical and posterior apical bands ..... ***Sinanoplomus***
–. Wing pattern different **17**
17. Wing with brown band over crossvein R-M (discal band) oblique, reaching or directed towards costa beyond end of cell sc, separated from it by hyaline band or indentation, if ending close to apex of cell sc then 1st flagellomere apically rounded and band across crossvein DM-Cu connected with subapical or apical brown markings **18**
–. Wing with brown or yellow band over crossvein R-M (discal band), when present, transverse or nearly so, usually reaching or directed towards costa within cell sc, if ending in cell r_1 at apex of cell sc then 1st flagellomere dorsoapically pointed and band across crossvein DM-Cu not joined with subapical and apical dark markings; discal band sometimes not extending over crossvein R-M (subapical band is instead) **22**

18. Scutum with four longitudinal black vittae, middle pair aligned with acrostichal setae; head with two frontal setae ..... ***Cyrtostola***
–. Scutum black, or with obscure lyre-like pattern, or almost entirely yellow, or with two or three (rarely 0 or 5) longitudinal black vittae, lateral pair often interrupted, medial vitta often absent, particularly in males; head with 2-5, usually 3-5, frontal setae **19**
19. Postpronotal seta absent; 2 frontal setae ..... ***Anoplomus***
–. Postpronotal seta present; 3-5 frontal setae **20**
20. Head about 1.1 times as high as long; aculeus flat, broad and non-setulose; wing with cell bc fulvous; arista pubescent (in type species) ..... ***Paragastrozona***
–. Head 1.33-1.50 times as high as long; aculeus variable but often narrow and with long setulae preapically; cell bc variable, but usually mostly or entirely hyaline, arista usually plumose **21**
21. Mesonotum usually predominantly yellow or with more or less balanced pattern of yellow and darker parts, often including black or blackish medial vitta broadened anterior to scutellum in female and trace of such vitta in male, connected to median scutellar spot, or transverse brownish prescutellar band; aculeus elongate and with long setulae preapically ..... ***Gastrozona***
–. Mesonotum predominantly black or blackish, without such pattern, aculeus broad ..... ***Proanoplomus***
22. Scutum without distinct yellow or white prescutellar markings; scutellum fulvous to yellow or medially darkened but without posterior black patches, or scutum and scutellum predominantly shiny black **23**
–. Scutum with distinct yellow or white prescutellar markings, if not than scutellum with three large posterior black patches or mostly black posteriorly **25**
23. Wing predominantly dark with few, relatively large, hyaline spots and indentations, not banded..... ***Phaeospila***
–. Wing pattern banded **24**
24. Wing bands generally parallel except when narrow spiral costal band present from wing tip to base of pterostigma, then to tip of vein A_1+Cu_2, sometimes connected to band over crossvein DM-Cu ..... ***Acrotaeniostola***
–. Wing bands generally convergent at distal 0.66 of wing; costal band present, but neither narrow, nor spiral ..... ***Pardalaspinus*** (part)
25. Wing pattern reticulate or reticulate-banded, brown, with at most few small indistinct yellow brown patches, with hyaline spots and indentations at least in apical half, without subapical or costal bands ..... ***Phaeospilodes***
–. Wing pattern banded, yellow or yellow and brown, if bands not evident in apical half, then pattern there diffuse **26**
26. Two postpronotal setae; 1st flagellomere rounded apically ..... ***Chelyophora***
–. One postpronotal seta; 1st flagellomere rounded or pointed apically **27**
27. Scutum and scutellum predominantly shiny black; 1st flagellomere usually rounded apically ..... ***Pardalaspinus*** (part, at least including the type species — *laqueatus*)
–. Scutum and scutellum not predominantly shiny black; 1st flagellomere pointed dorsoapically ..... ***Acroceratitis***

CATALOG OF GASTROZONINI

1. ACROCERATITIS

Acroceratitis Hendel, 1913b: 82. Type species: *plumosa* Hendel (OD). Latest reference: Hancock and Drew, 1999: 638.

Stictaspis Bezzi, 1913: 102. Type species: *ceratitina* Bezzi (OD). Synonymy: Hardy, 1973: 217.

Acroceratis Shinji, 1940a: 163, Missp. *Acroceratitis* Hendel.

Acroceratitis bilineata

Chelyophora bilineata Meijere, 1914: 205. HT F (ZMAN), Indonesia. Java: Semarang. Type data: Hardy, 1988: 80. Latest reference: Hancock and Drew, 1999: 640.
Distribution: Indonesia (Java), w. Malaysia (Selangor).

Acroceratitis bimacula

Acroceratitis bimacula Hardy, 1973: 223. HT M (KUB), Thailand. Nakhon Ratchasima: Pak Chong. Latest reference: Hancock and Drew, 1999: 642.
Distribution: India (Andaman and Nicobar Is.), China (Guangxi, Yunnan), Thailand, Laos, Vietnam.

Acroceratitis ceratitina

Stictaspis ceratitina Bezzi, 1913: 103. HT F (ZSI), India. Bihar: Parasnath, 4400 ft. Latest reference: Hancock and Drew, 1999: 643.

Acroceratitis cognata Hardy, 1973: 225. HT M (BBM), Thailand. Tak: Mae Sot Dist., Huai Muang, Canton, 200 m. Synonymy: Hancock and Drew, 1999: 643.

Chelyophora clavifera Hering, 1938c: 7. HT F (NRS), Burma. s. Shan: Inle Lake, s. end, Taungdo, 900 m. Synonymy: Hancock and Drew, 1999: 643.

Chelyophora gladiella Munro, 1938: 22. ST B (ZSI), India. Bihar: Pusa. Type data: Kapoor 1993: 93. Synonymy: Hancock and Drew, 1999: 643.

Acroceratitis biseta Wang, 1998: 24. HT M (IZAS), China. Yunnan: Xishuangbanna (20ºN 100.8ºE). Synonymy: Hancock and Drew, 1999: 774.
Distribution: India (Uttar Pradesh, Bihar, W. Bengal, Assam), China (Yunnan), Burma, Thailand.

Acroceratitis distincta

Chelyophora distincta Zia, 1964: 47. HT M (IZAS), China. Yunnan: Kin-ping [Jinping], 370 m. Latest reference: Hancock and Drew, 1999: 645.

Phaeospilodes fritilla Hardy, 1973: 199. HT M (KUB), Thailand. Phra Nakhon: Bangkhen [Bang Khen, 13°52'N 100°36'E]. Synonymy: Wang, 1998: 43; Hancock and Drew, 1999: 645.

Phaeospilodes distincta: Wang, 1998: 43 (redescription; China).
Distribution: ne. and s. India, China (Yunnan), Laos, Thailand, Vietnam.

Acroceratitis hardyi

Acroceratitis hardyi Hancock and Drew, 1999: 647. HT M (BMNH), Malaysia. Selangor: Ulu Langet, nr. Kuala Lumpur.
Distribution: s. Thailand, w. Malaysia (Selangor).

Acroceratitis histrionica

Chelyophora histrionica Meijere, 1914: 205. ST B (ZMAN), Indonesia. Java: Buitenzorg [Bogor]; and Semarang. Inference of holotype by Hardy (1973: 227, 1988: 80) invalid. Latest reference: Hancock and Drew, 1999: 649.
Distribution: Sri Lanka, Thailand, Laos, w. Malaysia, Indonesia (Java).

Acroceratitis incompleta

Acroceratitis incompleta Hardy, 1973: 227. HT M (BBM), Thailand. Chiang Mai: Doi Suthep, 1278 m. Latest reference: Hancock and Drew, 1999: 650.
Distribution: China (Yunnan), n. Thailand, Laos.

Acroceratitis nigrifacies

Acroceratitis nigrifacies Meijere, 1924: 36. LT M (ZMAN), Indonesia. Sumatra: Barat, Padang Plateau, Buo. Lectotype designated by inference of holotype by Hardy (1988: 81). Latest reference: Hancock and Drew, 1999: 652.
Distribution: w. Malaysia, Indonesia (Sumatra).

Acroceratitis plumosa

Acroceratitis plumosa Hendel, 1913b: 82. ST F (DEI, NMW), Taiwan. Kankau. Type data (Hardy, 1968: 108). Latest references: Wang 1998: 25; Hancock and Drew, 1999: 653.
Distribution: China (Zhejiang, Yunnan, Hainan), Taiwan.

Acroceratitis separata

Stictaspis separata Bezzi, 1913: 104. HT F (ZSI), India. Nagaland: Kohima. Latest references: Hancock and Drew, 1999: 655; Hancock and McGuire, 2002: 5.

Acroceratitis flava Premlata and Singh, 1988: 635. HT F (PUCP), India. Punjab: Chandigarh. Synonymy: Hancock and Drew, 1999: 654.
Distribution: India (Punjab, Nagaland), Thailand.

Acroceratitis septemmaculata

Acroceratitis septemmaculata Hardy, 1973: 231. HT F (KUB), Thailand. Phu Kae. Latest reference: Hancock and Drew, 1999: 655; Hancock and McGuire, 2002: 5.
Distribution: Thailand.

Acroceratitis siamensis

Chelyophora siamensis Munro, 1935a: 17. HT M (ZSI), Thailand. Nakhon Ratchasima: Kao, Lat Bua [Lat Bua Khao Station, 14º52'N 101º36'E]. Latest reference: Hancock and Drew, 1999: 656.

Acroceratitis similis Hardy, 1973: 233. HT M (KUB), Thailand. Phu Kae. Synonymy: Hancock and Drew, 1999: 656.
Distribution: Thailand.

Acroceratitis striata

Ceratitis striata Froggatt, 1909: 111. LT M (NSWA), Sri Lanka: Central: Peradeniya, Royal Botanic Gardens. Lectotype designated by Hancock and Drew (1999: 658).
Distribution: Sri Lanka.

Acroceratitis tenmalaica

Acroceratitis tenmalaica Hancock and Drew, 1999: 659. HT M (BMNH), India. Kerala: Tenmalai, 500-800 ft.
Distribution: India (Kerala).

Acroceratitis tomentosa

Acroceratitis tomentosa Hardy, 1973: 235. HT F (KUB), Thailand. Bangkok, Bangkhen. Latest reference: Hancock and Drew, 1999: 661.

Acroceratitis maculata Premlata and Singh, 1988: 635. HT M (PUCP?), India. Punjab: Chandigarh. Synonymy: Hancock and Drew, 1999: 661.
Distribution: India (Punjab), Thailand.

2. ACROTAENIOSTOLA

Acrotaeniostola Hendel, 1914: 80. Type species: *sexvittata* Hendel (OD). Latest reference: Hancock and Drew, 1999: 662.

Acrotaeniostola apiventris

Acrotaeniostola apiventris Munro, 1935a: 19. HT M (ZSI), India. W. Bengal: e. Himalayas, Darjeeling Dist., Pashok, 2000 ft. Latest reference: Hancock and Drew, 1999: 664.
Distribution: India (W. Bengal, Arunachal Pradesh, Meghalaya), n. Thailand.

Acrotaeniostola flavoscutellata

Acrotaeniostola flavoscutellata Shiraki, 1933: 149. HT F (NTU), Taiwan. Shinchiku or Musha. Described from 2 females from 2 localities, but which is type locality not specified. Latest reference: Hancock and Drew, 1999: 665.

Acrotaeniostola antennata Shiraki, 1968: 49. HT M (USNM), Japan. Ryukyu Is.: Okinawa I. Synonymy: Hardy, 1973: 170.

Distribution: Japan (Ryukyu Is.), Taiwan.

Acrotaeniostola fuscinotum

Acrotaeniostola fuscinotum Hering, 1938c: 16. HT M (NRS), Burma. Kachin: Kambaiti [25°24'N 98°9'E]. Latest reference: Hancock and Drew, 1999: 666.

Distribution: Burma, Vietnam.

Acrotaeniostola longicauda

Acrotaeniostola longicauda Wang, 1998: 28. HT M (IZAS), China. Yunnan: Menglongbanna (21.5°N 100.6°E), 1600 m. Treated as synonym of *A. morosa* (Hering), by Hancock and Drew (1999: 774). Reinstated from synonymy in this publication (see Explanations to taxonomic changes, at the end of this catalog).

Acrotaeniostola morosa: Hancock and Drew, 1999: 666. Misid. (Thailand specimens).

Distribution: China (Yunnan), n. Thailand.

Acrotaeniostola morosa

Taeniostola morosa Hering, 1938c: 15. HT F (NRS), Burma. Kachin: Kambaiti [25°24'N 98°9'E].

Distribution: n. Burma.

Acrotaeniostola pieli

Acrotaeniostola pieli Zia, 1937: 157. HT M (IZAS), China. Zhejiang: Tien-Mo-Shan [Tianmushan]. Latest references: Wang, 1998: 29; Hancock and Drew, 1999: 668.

Distribution: China (Zhejiang).

Acrotaeniostola quadrivittata

Acrotaeniostola hoenei ssp. *quadrivittata* Chen, 1948: 94. HT F (IZAS), China. Fujian: Shao-woo [Shaowu]. Latest references: Wang, 1998: 29; Hancock and Drew, 1999: 668.

Distribution: China (Hubei, Fujian, Yunnan, Hainan).

Acrotaeniostola quinaria

Trypeta quinaria Coquillett, 1910: 308. ST B (USNM), China. Hong Kong. Latest references: Wang, 1998: 29; Hancock and Drew, 1999: 669.

Acrotaeniostola rubra Chen, 1948: 95. HT M (IZAS), Vietnam. Hoa-Binh. Synonymy: Hardy, 1973: 171; Hancock and Drew, 1999: 669.

Spilographa quadrifasciata Enderlein, 1911: 436. HT F (PAN), Indonesia. Sumatra: Soekaranda. Type data: Hardy, 1988: 83. Synonymy: Hancock and Drew, 1999: 669.

Acrotaeniostola quinaria: Chen, 1948: 72.

Distribution: China (Guangdong, Hong Kong, Hainan), Thailand, Laos, Vietnam, Malaysia (w. and Sabah), Indonesia (Sumatra).

Acrotaeniostola scutellaris

Trypeta scutellaris Matsumura, 1916: 415. ST M (HUS), Japan. Hokkaido: Sapporo; and Honshu: Towada. Syntypes not located in HUS by Wang (1998: 30). Latest references: Korneyev, 1997: 34; Wang, 1998: 28, 30; Hancock and Drew, 1999: 670.

Acrotaeniostola hoenei Hering, 1936: 57. HT F (BMNH), China. Zhejiang: W. Tien-Mu-Shan [Tianmushan]. Synonymy: Hancock and Drew 1999: 670.

Acrotaeniostola hönei Hering, 1936: 57, Incosp. hoenei Hering. Automatic correction under Art. 32.5.2.1.

Acrotaeniostola honei Wang, 1998: 28, Missp. *hoenei* Hering.

Distribution: China (Zhejiang, Guangxi), Korea, Russia (Kurile Is.), Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Acrotaeniostola sexvittata

Acrotaeniostola sexvittata Hendel, 1914: 80. T A (MNM, NMW), Formosa [Taiwan]. Latest references: Wang, 1998: 30, Hancock and Drew, 1999: 672.

Acrotaeniostola helvenaca Ito, 1984a: 71. HT M (UOPJ), Japan. Ryukyu Is.: Iriomote I., Omotoyama. Synonymy: Hancock and Drew, 1999: 672.

Acrotaeniostola sexvittata Hendel, 1915: 438. ST B (MNM, NMW), Taiwan. Taihorin; Mt. Hoozan; and Kankau. Preoccupied by Hendel, 1914. Type data: Hardy, 1968: 108.

Acrotaeniostola helvanaca Norrbom et al., 1999: 72, Missp. *helvenaca* Ito.

Distribution: Japan (Ryukyu Is.), Taiwan.

Acrotaeniostola spiralis

Acrotaeniostola spiralis Munro, 1935a: 18. HT F (ZSI), Bangladesh. Chittagong Hills, Rangamati. Latest references: Wang, 1998: 30; Hancock and Drew, 1999: 673.

Distribution: Bangladesh, India (Meghalaya), China (Yunnan, Hainan), Laos, Malaysia (Sabah), Indonesia (Sumatra).

Acrotaeniostola yunnana

Acrotaeniostola yunnana Wang, 1998: 31. HT F (IZAS), China. Yunnan: Cheli (22.0°N 100.8°E), 700 m. Latest reference: Hancock and Drew, 1999: 774, 775.

Distribution: India (Meghalaya), China (Yunnan).

3. ANOPLOMUS

Anoplomus Bezzi, 1913: 100. Type species: *flexuosus* Bezzi (= *cassandra* Osten Sacken) (OD). Latest reference: Hancock, 1999: 936.

Anoplomus cassandra

Trypeta cassandra Osten Sacken, 1882: 228. HT M (DEI), Philippines. Latest references: Wang, 1998: 14; Hancock, 1999: 936.

Anoplomus flexuosus Bezzi, 1913: 100, N. N. *fasciventris* Macquart, 1848.

Tephritis fasciventris Macquart, 1848: 225. ST B (Payen), Indonesia. Java. Preoccupied by Macquart, 1843.

Distribution: India, China (Yunnan), Burma, Thailand, Laos, Philippines, Indonesia (Java).

Anoplomus hainanensis

Anoplomus hainanensis Wang, 1998: 14. HT M (IZAS), China. Hainan: Yinggen (19.0°N 109.8°E), 200 m.

Distribution: China (Hainan).

Anoplomus nigrifemoratus

Anoplomus nigrifemoratus Hardy, 1973: 242. HT M (BBM), Laos. Vientiane: Ban Van Eue.

Distribution: Laos.

Anoplomus rufipes

Anoplomus rufipes Hardy, 1973: 243. HT M (BBM), Thailand. Chiang Mai: Chiang Dao.

Distribution: Thailand, Laos.

4. BISTRISPINARIA

Bistrispinaria Speiser, 1913: 145. Type species: *Ceratitis fortis* Speiser (OD). Proposed as a subgenus of *Ceratitis*. Latest reference: Hancock, 1999: 914.

Bistrispinaria atlas

Clinotaenia atlas Munro, 1957: 866. HT M (BMNH), Uganda. Ruwenzori Range, Namwamba Valley, 6500 ft. Latest reference: Hancock, 1999: 915.

Clinotaenia atlas Munro, 1956: 465. HT F (MRAC?), Burundi. Urundi, Bururi, 1800-2000 m. Nomen nudum. Published after 1930 without a description or bibliographic reference to one.
Distribution: Uganda, Burundi, Kenya.

Bistrispinaria fortis

Ceratitis fortis Speiser, 1913: 145. HT M (Unknown), Cameroon. Mt. Cameroon, Soppo. Latest reference: Hancock, 1999: 916.

Pardalaspis aglaspis Séguy, 1941: 117. T M (MNHNP), Ivory Coast. Kouibly. Synonymy: Munro, 1957: 867.
Distribution: Ivory Coast, Nigeria, Cameroon, Zaire, Uganda.

Bistrispinaria magniceps

Chelyophora magniceps Bezzi, 1918: 229. HT F (BMNH), Sudan. Latest reference: Hancock, 1999: 918.

Chelyophora lemniscata Enderlein, 1920: 355. ST B (ZMHU), Kenya. Mombassa; and Tanzania. Mtoashimu; and Kwasengiwa. Synonymy: Bezzi, 1924b: 98.
Distribution: Sudan, Uganda, Kenya, Tanzania, Malawi, Mozambique.

Bistrispinaria woodi

Chelyophora woodi Bezzi, 1924b: 98. LT M (BMNH), Malawi. Cholo. Lectotype designated by Hancock (1999: 919).

Chelyophora uranos Hering, 1942: 280. ST B (ZMHU), Cameroon. Uam region, Bosum. Synonymy: Hancock, 1999: 919.

Chelyophora woodi Bezzi, 1924a: 14. HT M (MRAC), "Congo da Lemba". Nomen nudum. Published without a diagnosis or indication; the only character mentioned is said to be shared by another species (Hancock, 1999: 921).
Distribution: Nigeria, Cameroon, Zaire, Rwanda or Burundi ("Ruanda-Urundi", as per Munro 1956: 465), Malawi.

5. CARPOPHTHORELLA

Carpophthorella Hendel, 1914: 80. Type species: *magnifica* Hendel (OD). Latest reference: Hancock and Drew, 1999: 673.

Carpophtherella Hardy, 1974: 155, Missp. *Carpophthorella* Hendel.

Carpophthorella capillata

Gastrozona capillata Bezzi, 1914: 324. ST F (Baker), Philippines. Luzon, Laguna: Los Banos. Lectotype designation of Hardy (1969: 481) invalid; syntypes currently in MCSNM. Latest reference: Hancock and Drew, 1999: 675.

Gastrozona luteiseta Bezzi, 1914: 325. ST M (Baker), Philippines. Luzon, Laguna: Los Banos. Lectotype designation of Hardy (1969: 481) invalid; syntypes currently in MCSNM. Synonymy: Hancock and Drew, 1999: 676.
Distribution: Philippines, ?Malaysia (Sabah) [possible misidentification of *Carpophthorella sookae*].

Carpophthorella magnifica

Carpophthorella magnifica Hendel, 1914: 80. T A (MNM), Formosa [Taiwan]. Latest reference: Hancock and Drew, 1999: 677.

Carpophthorella magnifica Hendel, 1915: 449. ST B (MNM), Taiwan. Kankau. Preoccupied by Hendel, 1914.
Distribution: Taiwan.

Carpophthorella nigrifascia

Trypeta nigrifascia Walker, 1860: 158. LT M (BMNH), Indonesia. Sulawesi: Makassar [Ujung Padang]. Lectotype designated by inference of holotype by Hardy (1959: 218). Latest reference: Hancock and Drew, 1999: 678.

Gastrozona albiscutellata Enderlein, 1920: 354. HT F (ZMHU), Indonesia. Sumatra: Padang, Bungus-Bucht [Bungus-Brucht]. Type data and Synonymy: Hardy, 1988: 90.

Carpophthorella setifrons Malloch, 1939: 263. HT F (BMNH), Solomon Is. Guadalcanal. Synonymy: Permkam and Hancock, 1995: 1328.

Trypeta retorta Walker, 1861: 16. LT F (BMNH), Indonesia. Maluku: Gilolo [Djailolo]. Lectotype designated by inference of holotype by Hardy (1959: 220). Synonymy: Hardy, 1988: 90.

Gastrozona bifasciata Meijere, 1916: 48. HT F (ZMAN), Indonesia. Sumatra: Simalur I., Labuan Badjau. Type data and Synonymy: Hardy, 1988: 90.

Distribution: Indonesia (Sumatra, Sulawesi, Maluku), Malaysia (Sarawak), Papua New Guinea, Solomon Is., Australia (Queensland).

Carpophthorella semipennata

Carpophthorella semipennata Hering, 1938c: 9. HT M (NRS), Burma. Kachin: Kambaiti [25°24'N 98°9'E]. Latest reference: Hancock and Drew, 1999: 679.

Distribution: Burma.

Carpophthorella sookae

Carpophthorella sookae Chua, 2003: 465. HT M (BMNH), Malaysia: Ulu Langat, Selangor.

Distribution: w. Malaysia.

Carpophthorella semipennata: Hancock and Drew, 1999: 679 [misidentification (Malaysian female), see Chua (2003: 468)].

6. CERATITOIDES

Ceratitoides Hendel, 1928: 365. Type species: *nigromaculata* Hendel (OD). Latest reference: Hancock, 1999: 939.

Ceratitoides nigromaculata

Ceratitoides nigromaculata Hendel, 1928: 366. HT F (DEI), Uganda. Latest reference: Hancock, 1999: 940.

Chelyophora frigida Hering, 1942: 281. HT M (ZMHU), Cameroon. Jaunde [Yaounde] region. Synonymy: Hancock, 1999: 940.

Distribution: Cameroon, Uganda.

7. CHAETELLIPSIS

Chaetellipsis Bezzi, 1913: 126. Type species: *paradoxa* Bezzi (OD). Latest reference: Hancock and Drew 1999: 681.

Podophysa Hering, 1938c: 8. Type species: *pretiosa* Hering (OD). Synonymy: Hancock, 1991: 122.

Poecillis Bezzi, 1913: 128. Type species: *judicanda* Bezzi (= *paradoxa* Bezzi) (OD). Synonymy: Hardy, 1973: 177.

Chaetellipsis alternata

Podophysa alternata Zia, 1963: 457. HT M (IZAS), China. Yunnan: Xi-Sang-Ban-Na [Xishuangbanna]. Latest reference: Hancock and Drew, 1999: 683.

Distribution: China (Yunnan), n. Thailand.

Chaetellipsis bivittata

Carpophthorella bivittata Hardy, 1988: 89. HT F (BBM), Malaysia. Sabah: 19 km N. of Kalabakan, forest camp, 60 m. Latest references: Chua, 1999: 196; Hancock and Drew 1999: 684.

Distribution: s. Thailand, Malaysia (w., Sarawak, Sabah).

Chaetellipsis dispilota

Chaetellipsis dispilota Hardy, 1973: 180. HT M (BBM), India. Uttar Pradesh: Ranikhet. Latest reference: Hancock and Drew, 1999: 687. Considered synonym of *C. alternata* by Wang (1998: 33), but possibly only paratypes from Thailand are that species (Hancock and Drew, 1999: 683).

Distribution: India (Uttar Pradesh).

Chaetellipsis kinabaluensis

Chaetellipsis kinabaluensis Hancock and Drew, 1999: 689. HT M (BMNH), Malaysia. Sabah: Poring Hot Springs, nr. Mt. Kinabalu.
Distribution: Malaysia (Sabah).

Chaetellipsis maculosa

Chaetellipsis maculosa Hancock and Drew, 1999: 690. HT M (BMNH), Malaysia. Selangor: Ulu Langat.
Distribution: w. Malaysia (Selangor), Indonesia (Java).

Chaetellipsis paradoxa

Chaetellipsis paradoxa Bezzi, 1913: 127. HT M (ZSI), India. Bihar: Parasnath, 4400 ft. Latest reference: Hancock and Drew, 1999: 693.
Distribution: Pakistan, India, Sri Lanka, China (Yunnan), Burma, Thailand, Laos.

Poecillis judicanda Bezzi, 1913: 128. ST F (ZSI), India. Bihar: Parasnath, 4300 ft. Synonymy: Hardy, 1973: 182.

Chaetellipsis atrata Hardy, 1973: 179. HT F (BBM), Laos. Vientiane: Ban Van Eue. Synonymy: Hancock and Drew, 1999: 693.

Gastrozona flavostriata Hering, 1938c: 12. HT F (NRS), Burma. Kachin: Kambaiti [25°24'N 98°9'E]. Synonymy: Hardy, 1973: 182.

Podophysa occipitalis Zia, 1963: 459. HT M (IZAS), China. Yunnan: Xi-Sang-Ban-Na [Xishuangbanna]. Synonymy: Hancock and Drew, 1999: 693.

Chaetellipsis pretiosa

Podophysa pretiosa Hering, 1938c: 9. HT M (NRS), Burma. Kachin: Kambaiti [25°24'N 98°9'E]. Latest reference: Hancock and Drew, 1999: 695.
Distribution: Burma.

8. CHELYOPHORA

Chelyophora Rondani, 1875: 433. Type species: *borneana* Rondani (MO). Latest reference: Hancock and Drew, 1999: 697.

Chelyophora borneana

Chelyophora borneana Rondani, 1875: 434. LT F (MCSNG), Malaysia. Sarawak. Lectotype designated by inference of holotype by Hardy (1988: 92). Latest reference: Hancock and Drew, 1999: 697.
Distribution: Malaysia (Sarawak).

9. CLINOTAENIA

Clinotaenia Bezzi, 1920: 225. Type species: *anastrephina* Bezzi (OD). Latest reference: Hancock, 1999: 921.

Clinotaenia anastrephina

Clinotaenia anastrephina Bezzi, 1920: 226. HT F (BMNH), Malawi. Mlanje: Mt. Mlanje [Sapitwa]. Latest reference: Hancock, 1999: 922.
Distribution: Zaire, Malawi.

Clinotaenia camerunica

Clinotaenia camerunica Hancock, 1999: 923. HT F (BMNH), Cameroon. Uam region, near Bosum.
Distribution: Cameroon.

Clinotaenia grata

Trypeta grata Wiedemann, 1830: 498. T F (ZMHU), Kap [South Africa. Cape Province or Cape of Good Hope]. Latest reference: Hancock, 1999: 925.

Clinotaenia cedarensis Munro, 1933: 30. HT F (SANC), South Africa. Natal: Cedara. Synonymy: Hancock, 1999: 925.

Distribution: South Africa (e. Cape, Natal).

Clinotaenia inyanga

Clinotaenia inyanga Hancock, 1985: 62. HT F (NMBZ), Zimbabwe. Nyanga, Rhodes Inyanga Orchard. Latest reference: Hancock, 1999: 927.
Distribution: Zaire, Zimbabwe.

Clinotaenia superba

Carpophthoromyia superba Bezzi, 1918: 226. HT F (BMNH), Malawi. Limbe, Chiromo, Ruo R. Latest reference: Hancock 1999: 928.
Distribution: Malawi, Mozambique.

10. CYRTOSTOLA

Cyrtostola Hancock and Drew, 1999: 699. Type species: *Taeniostola limbata* Hendel (OD).

Cyrtostola limbata

Taeniostola limbata Hendel, 1915: 435. ST B (DEI, MNM, BMNH), Taiwan. Taitorinsho; Taihorin; Sokutsu. Also possible syntypes in NMW (Hardy, 1968: 124). Latest reference: Hancock and Drew, 1999: 699.
Distribution: India (Uttar Pradesh, Assam), Nepal, China (Yunnan), Burma, Thailand, w. Malaysia, Taiwan; Papua New Guinea? [error?].

11. DIETHERIA

Dietheria Hardy, 1973: 183. Type species: *fasciata* Hardy (OD). Latest reference: Hancock and Drew, 1999: 701.

Dietheria fasciata

Dietheria fasciata Hardy, 1973: 184. HT M (BBM), Vietnam. Ban Me Thuot, 500 m. Latest reference: Hancock and Drew, 1999: 701.
Distribution: Thailand, China (Yunnan), Vietnam.

Dietheria gracilis

Taeniostola gracilis Bezzi, 1913: 120. HT F (ZSI), Burma. Karen: base of Dawna Hills. Latest reference: Hancock and Drew, 1999: 702.
Distribution: Burma.

12. ENICOPTERA

Enicoptera Macquart, 1848: 223. Type species: *flava* Macquart (OD). Latest reference: Hancock and Drew, 1999: 702.

Henicoptera Loew, 1873: 21, Emend. *Enicoptera* Macquart.

Enicoptera cuneilineata

Henicoptera cuneilineata Hering, 1937: 108. HT M (BMNH), Philippines. Luzon, Manila. Latest reference: Hancock and Drew, 1999: 706.

Enicoptera cuneilinea Hardy, 1974: 166, Missp. *cuneilineata* Hering.
Distribution: Philippines (Luzon).

Enicoptera flava

Enicoptera flava Macquart, 1848: 223. HT M (Payen), Indonesia. Java. Holotype stated to be in MNHNP, but not examined (Hancock and Drew, 1999: 706).
Distribution: Indonesia (Java).

Enicoptera flavofemoralis

Henicoptera flavofemoralis Hering, 1937: 107. HT M (BMNH), Philippines. Luzon, Bataan: Limay [14°34'N 120°36'E]. Latest reference: Hancock and Drew, 1999: 707.
Distribution: Philippines (Luzon).

Enicoptera gigantea

Enicoptera gigantea Enderlein, 1911: 413. LT M (PAN), Indonesia. Sumatra: Soekaranda. Lectotype designated by Hardy (1969: 480). Latest reference: Hancock and Drew, 1999: 708.
Distribution: w. Malaysia, Indonesia (Sumatra).

Enicoptera gressitti

Enicoptera gressitti Hardy, 1988: 97. HT F (BBM), Malaysia. Sabah: Sandakan Bay (SW.), Sapagaya lumber camp, 2-20 m. Latest reference: Hancock and Drew, 1999: 709.
Distribution: Malaysia (Sabah, Sarawak).

Enicoptera il

Henicoptera il Hering, 1938b: 411. HT M (BMNH), Philippines. Luzon. Latest reference: Hancock and Drew, 1999: 711.
Distribution: Philippines (Luzon, Leyte).

Enicoptera interrupta

Henicoptera interrupta Hering, 1937: 107. HT M (BMNH), Philippines. Mindanao, Surigao del Norte: Surigao. Latest reference: Hancock and Drew, 1999: 712.
Distribution: Philippines (Mindanao).

Enicoptera palawanica

Henicoptera palawanica Hering, 1942: 278. HT F (ZMHU), Philippines. Palawan. Latest reference: Hancock and Drew 1999: 713.
Distribution: Philippines (Palawan).

Enicoptera proditrix

Enicoptera proditrix Osten Sacken, 1882: 233. LT M (DEI), Philippines. Lectotype designated by Hardy (1969: 478). Latest reference: Hancock and Drew 1999: 714.
Distribution: Philippines.

Enicoptera spoliata

Henicoptera spoliata Hering, 1937: 106. HT M (BMNH), Philippines. Mindanao, Zamboanga del Sur: Port Banga [7°30'N 122°26'E]. Latest reference: Hancock and Drew, 1999: 715.
Distribution: Philippines (Mindanao).

Enicoptera sumatrana

Henicoptera sumatrana Hering, 1938b: 412. ST B (PAN, BMNH), Indonesia. Sumatra: Soekaranda. Latest reference: Hancock and Drew, 1999: 716.

Enicoptera proditrix Enderlein 1911: 414, Misid.
Distribution: Indonesia (Sumatra, Java, Sumbawa).

Enicoptera tortuosa

Enicoptera tortuosa Walker, 1860: 155. LT M (BMNH), Indonesia. Sulawesi: Makassar [Ujung Padang]. Lectotype designated by inference of holotype by Hardy (1959: 188). Latest reference: Hancock and Drew, 1999: 717.
Distribution: Indonesia (Sulawesi).

13. GALBIFASCIA

Galbifascia Hardy, 1973: 247. Type species: *sexpunctata* Hardy (OD). Latest reference: Hancock and Drew 1999: 718.

Galbifascia sexpunctata

Galbifascia sexpunctata Hardy, 1973: 248. HT M (BBM), Laos. Vientiane: Muong Tourakom, 120 m. Latest reference: Hancock and Drew, 1999: 719.

Galbifascia quadripunctata Hardy, 1973: 247. HT F (BMNH), Sri Lanka. Central: Pundaluoya [7°01'N 80°40'E]. Synonymy: Hancock and Drew 1999: 719.
Distribution: India (Kerala), Sri Lanka, China (Yunnan), Thailand, Laos, Vietnam, Philippines (Luzon).

14. GASTROZONA

Gastrozona Bezzi, 1913: 105. Type species: *Tephritis fasciventris* Macquart (OD). Latest reference: Hancock and Drew, 1999: 71.

Gastrozoa Shinji, 1939: 289, Missp. *Gastrozona* Bezzi.

Gastrozona balioptera

Gastrozona balioptera Hardy, 1973: 188. HT M (BMNH), Thailand. Chiang Mai: Chiang Dao. Latest reference: Hancock and Drew, 1999: 722.
Distribution: India (Arunachal Pradesh), China (Yunnan), Burma, Thailand.

Gastrozona fasciventris

Tephritis fasciventris Macquart, 1843: 382. T M (MNHNP), "Indes orientales". Latest reference: Hancock and Drew, 1999: 723.

Gastrozona melanista Bezzi, 1913: 107. HT F (ZSI), India. Kerala: on ship, 5 mi. off Calicut [Kozhikode], Malabar Coast. Synonymy: Hardy, 1973: 190.

Gastrozona macquarti Hendel, 1913a: 38. ST B (DEI, NMW), Taiwan. Kanshirei. Type data: Hardy, 1968: 117. Synonymy: Hardy, 1973: 190.

Gastrozona melanophila Hering, 1940a: 3. HT M (BMNH), Taiwan. Tao Tsui Kutsu. Synonymy: Hardy, 1973: 190.

Tephritis vittata Macquart, 1851: 263. T F (MNHNP), Asia. Synonymy: Hardy, 1973: 190.

Gastrozona appendiculata Zia, 1938: 22. HT M (IZAS), China. se. Gansu: Cheumen [Yumen]. Synonymy: Hardy, 1973: 190.

Tephritis fusciventris Macquart, 1843: 459, Incosp. *fasciventris* Macquart. Hardy, 1973: 190 (FR).
Distribution: China (Gansu), India, Bangladesh, Burma, Thailand, Laos, Vietnam, w. Malaysia, Indonesia (Sumatra), Taiwan.

Gastrozona hirtiventris

Gastrozona hirtiventris Chen, 1948: 97. HT M (IZAS), China. Zhejiang: Mokanshan [Moganshan]. Latest references: Wang, 1998: 37, Hancock and Drew 1999: 722, Hancock and McGuire, 2002: 6.
Distribution: China (Zhejiang), Thailand.

Gastrozona isis

Gastrozona isis Hering, 1938c: 12. HT M (NRS), Burma. Kachin: Kambaiti [25°24'N 98°9'E]. Latest reference: Hancock and Drew, 1999: 726.
Distribution: Burma.

Gastrozona montana

Gastrozona montana Bezzi, 1913: 106. ST B (ZSI), India. W. Bengal: e. Himalayas, Kurseong, 5000 ft. Latest reference: Hancock and Drew, 1999: 728.
Distribution: India (Assam, W. Bengal), Burma.

Gastrozona parviseta

Gastrozona parviseta Hardy, 1973: 192. HT M (BBM), Thailand. Chiang Mai: Chiang Dao, 450 m. Latest reference: Hancock and Drew, 1999: 729.

Gastrozona menglanica Wang, 1998: 37. HT F (BAUC), China. Yunnan: Mengla (21.4°N 101.5°E), 800 m. Synonymy: Hancock and Drew, 1999: 774.
Distribution: India (Karnataka), China (Yunnan), Burma, Thailand.

Gastrozona proterva

Gastrozona proterva Hering, 1938c: 13. HT M (NRS), Burma. Kachin: Kambaiti [25°24'N 98°9'E]. Latest references: Hardy, 1973: 187; Hancock and Drew, 1999: 730.

Gastrozona solitaria Hering, 1938c: 14. HT F (NRS), Burma. Kachin: Kambaiti [25°24'N 98°9'E]. Synonymy: Hancock and Drew, 1999: 730.
Distribution: India, Burma.

Gastrozona quadrivittata

Gastrozona quadrivittata Wang, 1992: 1150. HT F (IZAS), China. Guizhou: Mt. Leigong (26.4°N 108.2°E), 1700-2000 m.
Distribution: China (Guizhou, Hunan).

Gastrozona selangorensis

Gastrozona selangorensis Chua, 2003: 468. HT M (BMNH), Malaysia (Ulu Langat).
Distribution: Malaysia (Peninsular).

Gastrozona soror

Acidia soror Schiner, 1868: 264. HT M (NMW), Indonesia. Java: Batavia [Jakarta]. Type data: Hardy, 1968: 141.

Gastrozona fasciventris Bezzi, 1913: 105, Misid. See Hancock and Drew (1999: 732).
Distribution: India (Assam), Thailand, Indonesia (Java).

15. ICHNEUMONOPSIS

Ichneumonopsis Hardy, 1973: 132. Type species: *burmensis* Hardy (OD).

Ichneumonopsis burmensis

Ichneumonopsis burmensis Hardy, 1973: 133. HT M (BMNH), Burma. Chin: Chin Hills, Mount Victoria [21°14'N 93°55'E], 1400 m. Latest reference: Drew and Hancock, 1994: 830; Radhakrishnan, 2000: 203.
Distribution: India (Meghalaya), n. Burma.

16. LEUCOTAENIELLA

Leucotaeniella Bezzi, 1918: 227. Type species: *trispila* Bezzi (OD). Latest reference: Hancock, 1999: 930.

Leucotaeniella guttipennis

Leucotaeniella guttipennis Bezzi, 1920: 223. HT F (BMNH), Nigeria. Zungeru. Latest references: Hancock, 1999: 930; Hancock *et al.*, 2001: 49.
Distribution: Guinea, Nigeria, Zaire, Uganda, Zambia, Angola.

Leucotaeniella mambillae

Leucotaeniella mambillae Hancock, 1999: 932. HT F (BMNH), Nigeria. Mambilla Plateau, Ngel Nyaki.
Distribution: Nigeria.

Leucotaeniella pentaspila

Leucotaeniella pentaspila Bezzi, 1918: 229. HT F (BMNH), Sudan. Latest reference: Hancock, 1999: 933.
Distribution: Sudan, Zaire, Angola, Zambia.

Leucotaeniella trispila

Leucotaeniella trispila Bezzi, 1918: 228. LT M (BMNH), Malawi. Limbe, Chiromo, Ruo R. Lectotype designated by Hancock (1999: 935).
Distribution: Zambia, Malawi, Zimbabwe.

17. PARAGASTROZONA

Paragastrozona Shiraki, 1933: 154. Type species: *Gastrozona japonica* Miyake (OD). Latest reference: Hancock and Drew, 1999: 733.

Paragastrozoa Shinji, 1940a: 162, Missp. *Paragastrozona* Shiraki.

Paragastrozona apicemaculata

Gastrozona apicemaculata Hering, 1938c: 11. HT F (NRS), Burma. Kachin: Kambaiti [25°4'N 98°9'E]. Latest reference: Hancock and Drew, 1999: 734.
Distribution: Burma.

Paragastrozona fukienica

Gastrozona fukienica Hering, 1953: 5. HT F (ZFMK), China. Fujian: Kuatun. Latest reference: Hancock and Drew, 1999: 737.
Distribution: China (Fujian).

Paragastrozona japonica

Gastrozona japonica Miyake, 1919: 152. ST B (Unknown), Japan. Honshu: near Tokyo, Oji. Syntypes apparently lost (Shiraki, 1933: 156).

Gastrozona japonica var. *miyakei* Bezzi, 1926: 265. ST A (MCSNM), Japan. Hokkaido: Sapporo.
Distribution: e. Russia, Korea, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Taiwan.

Paragastrozona orbata

Gastrozona orbata Hering, 1938c: 10. HT F (NRS), Burma. Kachin: Kambaiti [25°24'N 98°9'E]. Latest reference: Hancock and Drew, 1999: 740.
Distribution: Burma.

Paragastrozona quinquemaculata

Paragastrozona quinquemaculata Wang, 1998: 40. HT M (IZAS), China. Sichuan: Mt. Emei (29.5°N 103.3°E). Latest reference: Hancock and Drew, 1999: 736.
Distribution: China (Sichuan).

Paragastrozona tripunctata

Taeniostola tripunctata Shiraki, 1968: 52. HT M (USNM), Japan. Ryukyu Is. Latest reference: Hancock and Drew, 1999: 741.

Gastrozona tripunctata: Hardy, 1973: 186.

Acroceratitis tripunctata: Hardy, 1977: 88.

Paragastrozona tripunctata: Ito, 1984b: 135.
Distribution: Japan (Ryukyu Is.).

Paragastrozona trivittata

Paragastrozona trivittata Hancock and Drew, 1999: 742. HT F (BMNH), Burma. Adung Valley, 8000 ft.
Distribution: n. Burma.

Paragastrozona vulgaris

Gastrozona vulgaris Zia, 1937: 151. HT M (IZAS), China. Jiangsu: Nanking [Nanjing]. Sex of holotype and type locality not indicated in original description, but determined from label data by Wang (1998: 39). Latest reference: Hancock and Drew, 1999: 744.

Taeniostola melli Hering, 1942: 276. HT M (ZMHU), China. Guangdong: Canton [Guangzhou]. Synonymy: Wang, 1998: 39; Hancock and Drew, 1999: 744.
Distribution: China (Sichuan, Anhui, Jiangsu, Zhejiang, Hunan, Fujian, Guangdong).

18. PARAXARNUTA

Paraxarnuta Hardy, 1973: 195. Type species: *bambusae* Hardy (OD). Latest reference: Hancock and Drew, 1999: 745.

Paraxarnuta anephelobasis

Paraxarnuta anephelobasis Hardy, 1973: 196. HT M (BBM), Thailand. Loei: 12-15 km NW. of Loei, 275 m. Latest references: Wang, 1998: 42; Hancock and Drew, 1999: 746.
Distribution: China (Yunnan), Thailand.

Paraxarnuta bambusae

Paraxarnuta bambusae Hardy, 1973: 197. HT M (BBM), Laos. Vientiane: Muong Tourakom, 180 m. Latest references: Wang 1998: 42; Hancock and Drew, 1999: 746.
Distribution: e. India, China (Yunnan), Thailand, Laos, Vietnam.

Paraxarnuta extorris

Acrotaeniostola extorris Hering, 1942: 277. HT F (ZMHU), Type locality unknown, probably "Indien" [Indonesia?]. Latest reference: Hancock and Drew, 1999: 748.
Distribution: w. Malaysia (Selangor), Indonesia (Java).

Paraxarnuta interrupta

Acrotaeniostola interrupta Hardy, 1988: 82. HT M (BBM), Malaysia. Selangor: Ulu Langat, 300-390 m. Latest reference: Hancock and Drew, 1999: 750.
Distribution: w. Malaysia.

Paraxarnuta maculata

Paraxarnuta maculata Wang, 1998: 42. HT M (IZAS), China. Yunnan: Cheli (22.0°N 100.8°E), 700 m.
Distribution: China (Yunnan).

19. PARDALASPINUS

Pardalaspinus Hering, 1952: 282. Type species: *Pardalaspis migrata* Hering (= *laqueata* Enderlein) (OD).

Notophosa Zia, 1964: 53. Type species: *connexa* Zia (= *laqueata* Enderlein) (OD). Synonymy: Hancock and Drew, 1994: 875.

Ceratitisoma Zia, 1964: 54. Type species: *bimaculatum* Zia (OD). Synonymy: Hancock and Drew, 1994: 875.

Notophysa Hancock and Drew, 1994: 875, Missp. *Notophosa* Zia.

Pardalaspinus aberratus (N. Comb.)

Acroceratitis aberrata Hardy, 1973: 220. HT M (BBM), Laos. Vientiane: Ban Van Eue. Latest reference: Hancock, 1999: 946.

Ceratitoides aberratus: Hancock, 1999: 946.
Distribution: Laos.

Pardalaspinus adnatus (N. Comb.)

Acroceratitis adnata Hardy, 1973: 220. HT M (BBM), Laos. Vientiane: Ban Van Eue. Latest reference: Hancock, 1999: 946.

Ceratitoides adnatus: Hancock, 1999: 946.
Distribution: Laos.

Pardalaspinus adversarius

Pardalaspinus adversarius Hering, 1952: 283. HT M (RNH), Indonesia. w. Java: Radjamandala, 2-300 m. Latest reference: Hancock, 1999: 940.

Ceratitoides adversarius: Hancock, 1999: 940.
Distribution: Burma, Indonesia (Java).

Pardalaspinus bimaculatus

Ceratitisoma bimaculatum Zia, 1964: 50. HT M (IZAS), China. Yunnan: Shishong-Baanna [Xishuangbanna], Damenglung, 650 m. Latest reference: Hancock, 1999: 940.

Proanoplomus minor Hardy, 1973: 270. HT M (BBM), Thailand. Chiang Mai: Chiang Dao, 450 m.

Pardalaspinus bimaculatus: Hancock and Drew, 1994: 876.

Ceratitoides bimaculatus: Hancock, 1999: 940.
Distribution: China (Yunnan, Hainan), Thailand.

Pardalaspinus laqueatus

Ceratitis laqueata Enderlein, 1920: 347. HT F (ZMHU), Indonesia. Java. Type data:Hardy, 1988: 109. Latest reference: Hancock, 1999: 946.

Pardalaspis migrata Hering, 1944: 5. HT M (NMW), Ost-Indie [probably Indonesia]. Synonymy: Hancock and Drew, 1994: 876; Hancock, 1999: 946.

Notophosa connexa Zia, 1964: 49. HT M (IZAS), China. Yunnan: Shishong-Baanna [Xishuangbanna], Siao-meng-yan, 850 m. Synonymy: Hancock and Drew, 1994: 876; Hancock, 1999: 946.

Pardalaspinus laqueatus: Hancock and Drew, 1994: 876.

Ceratitoides laqueatus: Hancock, 1999: 940.

Distribution: e. India, China (Yunnan), Laos, Vietnam, Indonesia (Java).

Pardalaspinus maai (N. Comb.)

Chelyophora maai Chen, 1948: 92. HT M (IZAS), China. Fujian: Shao-Woo [Shaowu]. Latest references: Wang, 1998: 25; Hancock, 1999: 946.

Acroceratitis maai: Wang, 1998: 25.

Ceratitoides maai: Hancock, 1999: 939.

Distribution: India (Sikkim), China (Fujian), Laos.

Pardalaspinus namtamai (N. Comb.)

Ceratitoides namtamai Hancock, 1999: 942. HT M (BMNH), Burma. Nam Tamai Valley (27°42'N 97°54'E), 5000 ft.

Distribution: Burma.

Pardalaspinus nitidus

Proanoplomus nitidus Hardy, 1973: 271. HT M (KUB), Thailand. Uthai Thani: Uthai Thani. Latest reference: Hancock, 1999: 940.

Pardalaspinus nitidus: Hancock and Drew, 1994: 877.

Ceratitoides nitidus: Hancock, 1999: 940.

Distribution: Thailand.

Pardalaspinus sikhimensis (N. Comb.)

Ceratitoides sikhimensis Hancock, 1999: 944. HT M (BMNH), India. Sikkim: Singhik, 5000 ft.

Distribution: India (Sikkim).

Pardalaspinus vittatus

Proanoplomus vittatus Hardy, 1973: 276. HT F (KUB), Thailand. Kanchanaburi: Kanchanaburi. Latest reference: Hancock, 1999: 940.

Pardalaspinus vittatus: Hancock and Drew, 1994: 878.

Ceratitoides vittatus: Hancock, 1999: 940.

Distribution: India (Sikkim), Burma, Thailand.

Pardalaspinus yongi

Pardalaspinus yongi Hancock and Drew, 1995: 61. HT M (BMNH), Malaysia. Selangor: Kg. Perdik, Ulu Langat.

Ceratitoides yongi: Hancock, 1999: 940.

Distribution: w. Malaysia.

20. PHAEOSPILA

Phaeospila Bezzi, 1913: 117. Type species: *varipes* Bezzi (OD). Latest reference: Hancock and Drew, 1999: 751.

Phaeospila dissimilis

Acrotaeniostola dissimilis Zia, 1937: 159. HT M (IZAS), China. Szechuan [Sichuan]: Beibei. Sex of holotype and type locality not indicated in original description, but determined from label data by Wang (1998: 27). Latest references: Wang, 1998: 27; Hancock and Drew, 1999: 752.

Distribution: China (Hubei, Sichuan, Yunnan), Vietnam.

Phaeospila megispilota

Acrotaeniostola megispilota Hardy, 1974: 155. HT F (BBM), Philippines. Luzon, Mountain province: Abatan, Buguias, 60 km S. of Bontoc, 1800-2000 m. Latest reference: Hancock and Drew, 1999: 754.

Phaeospila megaspilota Hancock and Drew, 1999: 754, Missp. *megispilota* Hardy.

Distribution: Philippines (Luzon).

Phaeospila varipes

Phaeospila varipes Bezzi, 1913: 118. ST F (ZSI), India. W. Bengal: Darjeeling, 6000 and 7000 ft. Latest reference: Hancock and Drew, 1999: 754.

Distribution: India (W. Bengal).

21. PHAEOSPILODES

Phaeospilodes Hering, 1939: 170. Type species: *torquata* Hering (= *fenestella* Coquillett) (OD). Latest reference: Hancock and Drew, 1999: 754.

Phaeospilodes bambusae

Phaeospilodes bambusae Hering, 1940b: 322. LT F (BMNH), India. Tamil Nadu: Coimbatore. Lectotype designated by Hancock and Drew (1999: 755).

Distribution: India (Tamil Nadu).

Phaeospilodes fenestella

Oxyphora fenestella Coquillett, 1910: 308. HT F (USNM), China. Hong Kong. Latest references: Wang, 1998: 44; Hancock and Drew, 1999: 756.

Phaeospilodes torquata Hering, 1939: 171. HT F (MNHNP), Vietnam. Choganh. Synonymy: Hancock and Drew, 1999: 756.

Phaeospilodes atrifacies Hering, 1941a: 32. HT M (DEI), Indonesia. Nusa Tenggara: Lombok, Selong. Synonymy: Hancock and Drew, 1999: 756.

Ptilona poeciloptera Kertész, 1912: 543. ST M (MNM), China. Guangdong: Swatow [Shantou]. Synonymy: Hancock and Drew, 1999: 756.

Oxyna fenestrella Hardy, 1977: 126, Missp. *fenestella* Coquillett.

Phaeospilodes poeciloptera: Wang, 1998: 44.

Distribution: China (Fujian, Guangxi, Guangdong, Hong Kong, Hainan), Thailand, Vietnam, Indonesia (Java, Lombok).

Phaeospilodes paragoga

Taeniostola paragoga Hering, 1938c: 16. HT F (NRS), Burma. Kachin: Kambaiti [25°24'N 98°9'E]. Latest reference: Hancock and Drew, 1999: 758, 775.

Taeniostola paragoda Hardy, 1973: 210, Missp. *paragoga* Hering.

Distribution: e. India (Meghalaya), Burma.

22. PROANOPLOMUS

Proanoplomus Shiraki, 1933: 127. Type species: *japonicus* Shiraki (OD). Latest reference: Hancock 1999: 937.

Paranoplomus Shiraki, 1933: 131. Type species: *formosanus* Shiraki (OD).

Parnaoplomus Hardy, 1977: 96, Missp. *Paranoplomus* Shiraki. Attributed to “authors”.

Proanoplomus affinis

Proanoplomus affinis Chen, 1948: 89. HT F (IZAS), China. Zhejiang: Tianmushan.

Distribution: China (Zhejiang).

Proanoplomus arcus

Paranoplomus arcus Ito, 1949: 53. HT F (UOPJ), Japan. Honshu: Wakayama Prov., Koyasan, 900 m.

Distribution: Japan (Honshu).

Proanoplomus caudatus

Anoplomus caudatus Zia, 1964: 44. HT F (IZAS), China. Yunnan: Shishong-Baanna [Xishuangbanna], 700 m.
Distribution: China (Yunnan).

Proanoplomus cinereofasciatus (N. Comb.)

Carpophthoromyia cinereofasciata Meijere, 1924: 37. ST B (ZMAN), Indonesia. Sumatra: Tand Andalas. Type data: Hardy, 1988: 108. Latest reference: Hancock, 1999: 940.

Ceratitoides cinereofasciatus: Hancock, 1999: 940.
Distribution: Indonesia (Sumatra, Java), Malaysia (Sabah).

Proanoplomus cylindricus

Proanoplomus cylindricus Chen, 1948: 91. HT F (IZAS), Formosa [Taiwan].
Distribution: Taiwan.

Proanoplomus formosanus

Paranoplomus formosanus Shiraki, 1933: 131. ST B (NTU), Taiwan. Arisan. Latest reference: Hancock, 1999: 938.
Distribution: Taiwan.

Proanoplomus intermedius

Proanoplomus intermedius Chen, 1948: 91. HT F (IZAS), China. Fujian: Shao-Woo [Shaowu].
Distribution: China (Fujian).

Proanoplomus japonicus

Proanoplomus japonicus Shiraki, 1933: 128. ST B (NTU), Japan. Nagano; Kogota; Otoineppu; and Fukuoka. Latest reference: Hancock, 1999: 937.

Paragastrozoa nigricaudus Shinji, 1940a: 162. HT F (Shinji), Japan. Honshu: near Morioka, Kamiyonai.

Paragastrozoa nigricaudus Shinji, 1940b: 194. HT F (Shinji), Japan. Honshu: near Morioka. Preoccupied by Shinji, 1940a: 162.
Distribution: Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Proanoplomus longimaculatus

Proanoplomus longimaculatus Hardy, 1973: 268. HT F (UZMH), Burma. Kachin: Kambaiti [25°24'N 98°9'E], 2000 m. Depository misstated?, NRS?
Distribution: Burma.

Proanoplomus nigroscutellatus

Proanoplomus nigroscutellatus Zia, 1964: 45. HT M (IZAS), China. Yunnan: Shishong-Baanna [Xishuangbanna], 1200 m. Latest reference: Hancock, 1999: 938.
Distribution: e. India, China (Yunnan).

Proanoplomus omeiensis

Proanoplomus omeiensis Zia, 1964: 47. HT F (IZAS), China. Sichuan: Omeishan [Emei Shan].
Distribution: China (Sichuan).

Proanoplomus spenceri

Proanoplomus spenceri Hardy, 1973: 273. HT F (BBM), Vietnam. Fyan, 1200 m.
Distribution: Vietnam.

Proanoplomus yunnanensis

Proanoplomus yunnanensis Zia, 1964: 46. HT F (IZAS), China. Yunnan: Shishong-Baanna [Xishuangbanna]. Latest reference: Hancock, 1999: 938.

Proanoplomus trimaculatus Hardy, 1973: 274. HT M (UZMH), Laos. Nam Tiene. Distribution: Laos.
Distribution: e. India, China (Yunnan, Guangxi), Burma, Thailand, Laos, Indonesia (Java).

23. RHAIBOPHLEPS

Rhaibophleps Hardy, 1973: 203. Type species: *seclusa* Hardy (OD). Latest reference: Hancock, 1999: 938.

Rhaibophleps seclusa

Rhaibophleps seclusa Hardy, 1973: 204. HT M (BBM), Thailand. Nakhon Ratchasima: "Khorat Prov.", 300 km NE. Bangkok, Sakaerat [Ban Huai Sakae Rat], 300-400 m.
Distribution: Thailand, Laos, Cambodia.

24. SINANOPLOMUS

Sinanoplomus Zia, 1955: 64. Type species: *sinensis* Zia (OD). Latest reference: Hancock, 1999: 938.

Sinanoplomus fasciatus

Urophora fasciata Walker, 1856: 134. LT F (BMNH), Malaysia. Sarawak. Lectotype designated by inference of holotype by Hardy (1959: 226). Latest reference: Hancock, 1999: 938.

Carpophthoromyia borneensis Hering, 1952: 283. HT F (RNH), e. Borneo.
Distribution: Malaysia (Sarawak, Sabah), Indonesia (Kalimantan).

Sinanoplomus sinensis

Sinanoplomus sinensis Zia, 1955: 64. HT F (IZAS), China. Guangdong: Lianxian. Type data: Wang, 1998: 22.
Distribution: China (Guangdong).

25. SPILOCOSMIA

Spilocosmia Bezzi, 1914: 327. Type species: *bakeri* Bezzi (OD). Latest reference: Hancock and Drew, 1999: 758.

Prospilocosmia Shiraki, 1933: 212. Type species: *punctata* Shiraki (= *bakeri* Bezzi) (MO). Proposed as a subgenus of *Spilocosmia*.

Spilocosmia bakeri

Spilocosmia bakeri Bezzi, 1914: 327. ST M (Baker), Philippines. Luzon, Laguna: Mt. Makiling. Lectotype designation of Hardy (1969: 481) invalid; syntypes currently in MCSNM. Latest references: Wang, 1998: 45; Hancock and Drew, 1999: 759.

Prospilocosmia octavia Munro, 1935b: 256. HT M (DEI), Taiwan. Taihoku. Synonymy: Hancock and Drew, 1999: 759.

Spilocosmia (Prospilocosmia) punctata Shiraki, 1933: 214. ST B (NTU), Taiwan. Musha; Arisan; Rikiriki; Taito; and Urai. Synonymy: Hancock and Drew, 1999: 759.

Prospilocosmia punctata f. *kotoshoensis* Shiraki, 1933: 216. ST B (NTU), Taiwan. Kotosho. Synonymy: Hancock and Drew, 1999: 759.

Spilocosmia incompleta Wang, 1998: 45. HT F (CAS), China. Zhejiang: Moganshan (30.6°N, 119.8°E). Synonymy: Hancock and Drew, 1999: 774.

Spilocosmia octavia: Hardy, 1988: 115; Wang, 1998: 45.
Distribution: China (Zhejiang), Laos, Vietnam, Japan (Ryukyu Is.), Taiwan, Philippines (Luzon, Leyte, Mindanao), Indonesia (Nusa Tenggara).

26. TAENIOSTOLA

Taeniostola Bezzi, 1913: 119. Type species: *vittigera* Bezzi (OD). Latest reference: Hancock and Drew, 1999: 761.

Taeniostola striatipennis

Taeniostola striatipennis Hering, 1941b: 68. HT M (MNM), Malaysia. Sabah: Kinabalu. Latest reference: Hancock and Drew, 1999: 761.
Distribution: Malaysia (Sabah).

Taeniostola vittigera

Taeniostola vittigera Bezzi, 1913: 119. ST B (ZSI), Bangladesh. Sylhet; and India. Assam: Lungleh. Latest reference: Hancock and Drew, 1999: 762.

Taeniostola connecta Hendel, 1915: 436. ST M (MNM), Taiwan. Kosempo. Synonymy: Hancock and Drew, 1999: 762.

Taeniostola apicata Hering, 1938a: 250. HT F (ZSZMH), Indonesia. Kalimantan: Bidang Menabai, 700 m. Synonymy and type data: Hancock and Drew, 1999: 762; holotype probably destroyed.

Taeniostola plagiata Hering, 1938a: 245, Incosp. *apicata* Hering. Hardy 1973: 210 (first revisor).

Distribution: Bangladesh, India (Assam, Mizoram), China (Yunnan), Burma, Thailand, Laos, Taiwan, Malaysia (w., Sarawak, Sabah), Indonesia (Kalimantan).

27. XANTHORRACHIS

Xanthorrachis Bezzi, 1913: 137. Type species: *annandalei* Bezzi (OD). Latest reference: Hancock and Drew, 1999: 764.

Xanthorrachis annandalei

Xanthorrachis annandalei Bezzi, 1913: 138. HT F (ZSI), Burma. Karen: Dawna Hills, 2000-3000 ft. Latest references: Wang, 1998: 48; Hancock and Drew, 1999: 765.

Carpophthorella scutellomaculata Hering, 1951: 7. HT F (BMNH), India. Kerala: Anamalai Hills, 4000-5000 ft. Synonymy: Hardy, 1988: 119.

Distribution: India, China (Yunnan), Burma, Thailand, Laos, Vietnam, Indonesia (Java).

Xanthorrachis assamensis

Xanthorrachis assamensis Hardy, 1973: 283. HT M (BMNH), India. Assam: N. Khasi Hills, lower ranges. Latest references: Wang, 1998: 48; Hancock and Drew, 1999: 766.

Distribution: India (Assam, Arunachal Pradesh), China (Xizang, Yunnan).

Xanthorrachis sabahensis

Xanthorrachis sabahensis Hardy, 1988: 119. HT M (BBM), Malaysia. Sabah: Sandakan Bay (NW.), Sepilok Forest Reserve, 1-10 m. Latest reference: Hancock and Drew, 1999: 766.

Distribution: Malaysia (Sabah).

EXPLANATIONS TO TAXONOMIC CHANGES MADE IN THE CATALOG

As mentioned earlier, the catalog and key presented here are neither the result of a comprehensive revision nor a cladistic analysis. Therefore, we have restricted changes to the following:

1. *Ceratitoides nigromaculata* Hendel was separated from other congeners listed by Hancock (1999), based on a study of specimens collected by us in Cameroon. Males have more or less equally long abdominal tergites, unlike the enlarged second segment shown in Hancock's figure (Fig. 15) which, together with wing pattern, appears to be the main character used to maintain Asian species in this genus. With one exception, these Asian species are either newly placed in *Pardalaspinus* (*Acroceratitis aberrata* Hardy, *A. adnata* Hardy, *Chelyophora maai* Chen, *Ceratitoides namtamai* Hancock, and *C. sikhimensis* Hancock, all new combinations), or are returned to this genus. *Carpophthoromyia cinereofasciata* Meijere is moved from *Ceratitoides* and placed in *Proanoplomus* (n. comb.), which it seems to fit better based on wing pattern characters (see couplet 17 of key to genera above);
2. The wing figure of *Acrotaeniostola morosa* Hering by Hancock and Drew (1999, Fig. 16; bands narrow, pale, with wide spaces between them) does not conform to that by Hering (1938, Fig. 13; bands wide, dark, with narrow spaces in between) but does match Wang's

(1998) figure and description of *A. longicauda* Wang. Hence, the latter species is reinstated from the synonymy proposed by Hancock and Drew (1999).

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REFERENCES

Allwood, A.J., Chinajariyawong, A., Drew, R.A.I., Hamacek, E.L., Hancock, D.L., Hengsawad, C., Jipanin, J.C., Jirasurat, M., Kong Krong, C., Kritsaneepaiboon, S., Leong, C.T.S. and Vijaysegaran, S. 1999. Host plant records for fruit flies (Diptera: Tephritidae) in South East Asia. *The Raffles Bulletin of Zoology*. Supplement No. 7: 1-92. [1999.12.30]

Bezzi, M. 1913. Indian trypaneids (fruit-flies) in the collection of the Indian Museum, Calcutta. *Memoirs of the Indian Museum* 3: 53-175. [1913.05.??]

Bezzi, M. 1914. Studies in Philippine Diptera, I. *The Philippine Journal of Science* (1913) (D) 8: 305-332. [1914.01.16]

Bezzi, M. 1918. Notes on Ethiopian fruit-flies of the family Trypaneidae, other than *Dacus* (s.l.), with descriptions of new genera and species (Dipt.). — I. *Bulletin of Entomological Research* 8: 215-251. [1918.02.??]

Bezzi, M. 1920. Notes on the Ethiopian fruit-flies of the family Trypaneidae, other than *Dacus* — III. *Bulletin of Entomological Research* 10: 211-272. [1920.04.??]

Bezzi, M. 1924a. Sur quelques Trypaneides (Dipt.) du Musée du Congo belge. *Review Zoologique Africaine* 12: 9-16. [1924.03.01]

Bezzi, M. 1924b. Further notes on the Ethiopian fruit-flies, with keys to all the known genera and species [part]. *Bulletin of Entomological Research* 15: 73-118. [1924.08.30]

Bezzi, M. 1926. I generi *Gastrozona* e *Taeniostola* (Dipt.: Trypaneidae) ed una specie dannosa ai bambu nell' Estremo Oriente. *Bollettino del Laboratorio di Zoologia Generale ed Agraria della R. Scuola Superiore di Agricoltura di Portici* 18: 258-267. [1926.01.22]

Carroll, J.F. 1992. Systematics of fruit fly larvae (Diptera: Tephritidae). Dissertation, Texas A and M University, College Station. 341 pp. [1992.12.??]

Chen, S.H. 1948. Notes on Chinese Trypetinae. *Sinensia* (1947) 18: 69-123. [1948.03.??]

Chua, T.H. 1999. Fruit flies of the subfamilies Ceratitidinae, Tephritinae and Trypetinae in Malaysia (Diptera: Tephritidae). *Serangga* 4: 189-219. [1999.06.??]

Chua, T.H. 2003. New bamboo-shoot flies from Peninsular Malaysia (Diptera: Tephritidae: Ceratitidinae). *Journal of Natural History* 37: 463-472. [2003.02.20]

Coquillett, D.W. 1910. Two new Trypetidae from China. Entomological News 21: 308. [1910.07.??]

Drew, R.A.I. and Hancock, D.L. 1994. Revision of the tropical fruit flies (Diptera: Tephritidae: Dacinae) of South-east Asia. I. *Ichneumonopsis* Hardy and *Monacrostichus* Bezzi. *Invertebrate Taxonomy* 8: 829-838. [1994.11.08]

Enderlein, G. 1911. Trypetiden-Studien. *Zoologische Jahrbücher. Abteilung für Systematik, Geographie und Biologie der Tiere* 31: 407-460. [1911.09.11]

Enderlein, G. 1920. Zur Kenntnis tropischer Frucht-Bohrfliegen. *Zoologische Jahrbücher. Abteilung für Systematik, Geographie und Biologie der Tiere* 43: 336-360. [1920.07.13]

Foote, R.H., Blanc, F.L. and Norrbom, A.L. 1993. *Handbook of the fruit flies (Diptera: Tephritidae) of America north of Mexico*. 571pp. Cornell University Press, Ithaca. [1993.??.??]

Froggatt, W.W. 1909. Part III. Fruit flies. A general account of the flies belonging to the family Trypetidae, that damage sound fruit, with descriptions of the different species (some described as new) and their habits, range, and suggestions for destroying them. pp. 73-115. In: Official report on fruit fly and other pests in various countries 1907-1908. Report on parasitic and injurious insects. New South Wales Department of Agriculture, Sydney. [5] + 115 + [1] pp. [1909.??.??]

Han, H.-Y. and McPheron, B.A. 1997. Molecular phylogenetic study of Tephritidae (Insecta: Diptera) using partial sequences of the mitochondrial 16S ribosomal DNA. *Molecular Phylogenetics and Evolution* 7(1): 17-32. [1997.01.??]

Hancock, D.L. 1985. A key to *Clinotaenia* Bezzi and related genera (Diptera: Tephritidae) with description of a new species. *Transactions of the Zimbabwe Scientific Association* 62: 56-65. [1985.11.??]

Hancock, D.L. 1986. Classification of the Trypetinae (Diptera: Tephritidae), with a discussion of the Afrotropical fauna. *Journal of the Entomological Society of Southern Africa* 49 (2): 275-305. [1986.09.??]

Hancock, D.L. 1991: Revised tribal classification of various genera of Trypetinae and Ceratitinae, and the description of a new species of *Taomyia* Bezzi (Diptera: Tephritidae). *Journal of the Entomological Society of Southern Africa* 54 (2): 121-128. [1991.09.??]

Hancock, D.L. 1999. Grass-breeding fruit flies and their allies of Africa and Asia (Diptera: Tephritidae: Ceratitidinae). *Journal of Natural History* 33: 911-948. [1999.06.??]

Hancock, D.L. and Drew, R.A.I. 1994. Notes on *Anoplomus* Bezzi and related genera (Diptera: Tephritidae: Ceratitinae) in southeast Asia and Africa. *The Raffles Bulletin of Zoology* 42: 869-883. [1994.12.16]

Hancock, D.L. and Drew, R.A.I. 1995. A new species of *Pardalaspinus* Hering (Diptera: Tephritidae) from Peninsular Malaysia. *Malaysian Journal of Science* 16A: 61-62. [1995.12.??]

Hancock, D.L. and Drew, R.A.I. 1999. Bamboo-shoot fruit flies of Asia (Diptera: Tephritidae: Ceratitidinae). *Journal of Natural History* 33: 633-775. [1999.05.??]

Hancock, D.L., Kirk-Spriggs, A.H. and Marais, E. 2001. An annotated checklist and provisional atlas of Namibian Tephritidae (Diptera: Schizophora). *Cimbebasia* 17: 41-72. [2001.11.??]

Hancock, D.L. and McGuire, D.J. 2002. New species and records of non-dacine fruit flies (Insecta: Diptera: Tephritidae) from south and southeast Asia. *Steenstrupia* (2001) 27: 1-17. [2002.04.??]

Hardy, D.E. 1959. The Walker types of fruit flies (Tephritidae - Diptera) in the British Museum collection. *Bulletin of the British Museum (Natural History), Entomology* 8 (5): 159-242 + plates 11-16. [1959.11.??]

Hardy, D.E. 1968. The fruit flies types in the Naturhistorisches Museum, Wien (Tephritidae - Diptera). *Annalen des Naturhistorischen Museums in Wien* 72 (5): 107-155. [1968.??.??]

Hardy, D.E. 1969. Lectotype designations for fruit flies (Diptera: Tephritidae). *Pacific Insects* 11 (2): 477-481. [1969.08.30]

Hardy, D.E. 1973. The fruit flies (Tephritidae-Diptera) of Thailand and bordering countries. *Pacific Insects Monographs* 31: 353 pp. [1973.??.??]

Hardy, D.E. 1974. The fruit flies of the Philippines (Diptera: Tephritidae). *Pacific Insects Monographs* 32: 266 pp. [1974.06.30]

Hardy, D.E. 1977. Family Tephritidae (Trypetidae, Trupaneidae), pp. 44-134. In: Delfinado, M.D. and Hardy, D.E. (eds.), *A catalog of the Diptera of the Oriental Region*, Volume III, Suborder Cyclorrhaph, (excluding Division Aschiza). University of Hawaii Press, Honolulu. x + 854 pp. [1977.??.??]

Hardy, D.E. 1988. Fruit flies of the subtribe Gastrozonina of Indonesia, New Guinea and the Bismarck and Solomon Islands (Diptera, Tephritidae, Trypetinae, Acanthonevrini). *Zoologica Scripta* 17: 77-121. [1988.01.01]

Hendel, F.G. 1913a. H. Sauter's Formosa-Ausbeute. Acalyptrate Musciden (Dipt.). *Entomologische Mitteilungen* 2: 33-43. [1913.02.01]

Hendel, F.G. 1913b. H. Sauter's Formosa-Ausbeute. Acalyptrate Musciden (Dipt.) II. *Supplementa Entomologica* 2: 77-112. [1913.06.01]

Hendel, F.G. 1914. Die Gattungen der Bohrfliegen (Analytische Übersicht aller bisher bekannten Gattungen der Tephritinae.). *Wiener Entomologische Zeitung* 33: 73-98. [1914.04.30]

Hendel, F.G. 1915. H. Sauter's Formosa-Ausbeute. Tephritinae. *Annales Historico-Naturales Musei Nationalis Hungarici*. 13: 424-467. [1915.??.??]
Hendel, F.G. 1928. Neue oder weniger bekannte Bohrfliegen (Trypetidae) meist aus dem Deutschen Entomologischen Institut Berlin-Dahlem. *Entomologische Mitteilungen* 17: 341-370. [1928.09.20]
Hering, E.M. 1936. Zur Systematik und Biologie palaearktischer Bohrfliegen. 10. Beitrag zur Kenntnis der Trypetidae (Dipt.). *Konowia* 15: 54-64. [1936.04.01]
Hering, E.M. 1937. Die Henicoptera-Arten der Philippinen (Diptera). [8. Beitrag zur Kenntnis der Trypetidae]. *Philippine Journal of Science*. Sect. D 63: 105-108. [1937.05.??]
Hering, E.M. 1938a. Neue altweltliche Bohrfliegen. *Konowia* (1937) 16: 243-251. [1938.??.??]
Hering, E.M. 1938b. Neue palaearktische und exotische Bohrfliegen. *Deutsche Entomologische Zeitschrift* 1938 (2): 397-417. [1938.07.15]
Hering, E.M. 1938c. Entomological results from the Swedish Expedition 1934 to Burma and British India. Diptera: Fam. Trypetidae. *Arkiv för Zoologi* 30A (25): 56 pp. [1938.12.14]
Hering, E.M. 1939. Neue Trypetiden der Erde. *Verhandlungen Internationaler Kongress für Entomologie* (1938) (7th) 1: 165-190. [1939.03.??]
Hering, E.M. 1940a. I. Neue Arten und Gattungen. *Siruna Seva* 1: 1-16. [1940.05.09]
Hering, E.M. 1940b. Eine neue Fruchtfliege als Bambus-Schädling (Dipt.). *Annals and Magazine of Natural History* (11) 5: 322-323. [1940.03.??]
Hering, E.M. 1941a. Dipteren von den Kleinen Sunda-Inseln. Aus der Ausbeute der Sunda-Expedition Rensch. II. Trypetidae. (34. Beitrag zur Kenntnis der Trypetidae). *Arbeiten über Morphologische und Taxonomische Entomologie aus Berlin-Dahlem* 8: 24-45. [1941.05.10]
Hering, E.M. 1941b. Neue Fruchtfliegen aus dem Ungarischen National-Museum (Dipt.). (39. Beitrag zur Kenntnis der Trypetidae). *Annales Historico-Naturales Musei Nationalis Hungarici, Pars Zoologica* 34: 66-76. [after 1941.07.01]
Hering, E.M. 1942. Neue Gattungen und Arten von Fruchtfliegen aus dem Zoologischen Museum der Universität Berlin (Dipt.). (41. Beitrag zur Kenntnis der Trypetidae). *Mitteilungen aus dem Zoologischen Museum in Berlin* 25: 274-291. [1942.10.25]
Hering, E.M. 1944. Neue Gattungen und Arten von Fruchtfliegen der Erde. *Siruna Seva* 5: 1-17. [1944.10.16]
Hering, E.M. 1951. Neue Fruchtfliegen der Alten Welt. *Siruna Seva* 7: 1-16. [1951.03.31]
Hering, E.M. 1952. Fruchtfliegen (Trypetidae) von Indonesien (Dipt.). Treubia 21: 263-290. [1952.08.01]
Hering, E.M. 1953. Neue Fruchtfliegen von China, Vorderasien, Brasilien und Guatemala. *Siruna Seva* 8: 1-16. [1953.04.30]
Ito, S. 1949. Neue Trypetiden aus Japan (Diptera) (I). *Insecta Matsumurana* 17: 53-56. [1949.07.??]
Ito, S. 1984a. Lieferung 2, pp. 49-96. In: *Die japanischen Bohrfliegen*. Maruzen Co., Ltd., Osaka. 352 pp. (1985). [1984.01.31]
Ito, S. 1984b. Lieferung 3, pp. 97-144. In: *Die japanischen Bohrfliegen*. Maruzen Co., Ltd., Osaka. 352 pp. (1985). [1984.03.22]
Kapoor, V.C. 1993. *Indian fruit flies*. Oxford & IBH. New Delhi. 228 pp. [1993.??.??]
Kertész, K. 1912. Über einige Muscidae acalyptratae. *Annales Historico-Naturales Musei Nationalis Hungarici* 10: 541-548. [after 1912.12.29]
Kitto, G.B. 1983. An immunological approach to the phylogeny of the Tephritidae. Pp. 203-211. In: Cavalloro, R. (ed.), *Fruit flies of economic importance*. Proceedings of the CEC/IOBC International Symposium, Athens, Greece, November 16-19, 1982. A.A. Balkema, Rotterdam. xii + 642 pp. [1983.??.??]
Korneyev, V.A. 1997. New data and nomenclatural notes on the Tephritidae (Diptera) of Far East Russia. I. *Journal of the Ukrainian Entomological Society* 3(2): 29-35. [1997.??.??]
Korneyev, V.A. 1999. Phylogenetic relationships among higher groups of Tephritidae. pp. 73-113. In: Aluja, M. and Norrbom, A.L. (eds.), *Fruit flies (Tephritidae): Phylogeny and evolution of behavior*. CRC Press. Boca Raton. [16] + 944 pp. [1999.12.15]
Kovac, D. and Azarae I. 1994. Depradations [sic] of a bamboo shoot weevil: an investigation. *Nature Malaysiana* 19 (4): 115-122. [1994.??.??]
Loew, H. 1873. Monographs of the Diptera of North America. Part III. *Smithsonian Miscellaneous Collections* 11 (3 [= pub. 256]): vii + 351 + XIII p. [1873.12.??]

Macquart, J.P.M. 1843. Dipteres exotiques nouveaux ou peu connus [2(3)]. *Mémoires de la Société Royale des Sciences, de l'Agriculture et des Arts de Lille* 1842: 162-460 + 36 pls. [1843.??.??]
Macquart, J.P.M. 1848. Dipteres exotiques nouveaux ou peu connus. Suite du 2me supplement [i.e., 3e supplement]. *Mémoires de la Société Royale des Sciences, de l'Agriculture et des Arts de Lille* 1847 (2): 161-237 + 7 pls. [1848.11.22 or earlier]
Macquart, J.P.M. 1851. Dipteres exotiques nouveaux ou peu connus. Suite du 4e supplement. *Mémoires de la Société Royale des Sciences, de l'Agriculture et des Arts de Lille* 1850: 134-282 (text), 283-294 (explanation of figs., index) + pls. 15-28. [1851.04.05 or earlier]
Malloch, J.R. 1939. Solomon Islands Trypetidae. XVI. *Annals and Magazine of Natural History* (11) 4: 228-278. [1939.08.??]
Matsumura, S. 1916. *Thousand insects of Japan*. Additamenta, pp. 413-424. Vol. 2 (Diptera). Keisei-sha, Tokyo. p. 185-474 + [2], pls. 16-25. [1916.07.08]
McAlpine, J.F. 1981. Morphology and terminology-adults. pp. 9-63. In: McAlpine, J.F., Peterson, B.V., Shewell, G.E., Teskey, H.J., Vockeroth, J.R., Wood, D.M., (coordinators), *Manual of Nearctic Diptera*, vol. 1. Agriculture Canada, Monograph No. 27, Ottawa.
Meijere, J.C.H. de. 1914. Studien über südostasiatische Dipteren. IX. [concl.]. *Tijdschrift voor Entomologie* 57: 169-275. [1914.10.15]
Meijere, J.C.H. de. 1916. Fauna Simalurensis-Diptera. *Tijdschrift voor Entomologie* (1915) 58 (Suppl.): 1-63. [1916.03.01]
Meijere, J.C.H. de. 1924. Studien über südostasiatische Dipteren XV. Dritter Beitrag zur Kenntnis der sumatranischen Dipteren. *Tijdschrift voor Entomologie* 67 (Suppl.): 1-64. [1924.12.15]
Miyake, T. 1919. Studies on the fruit flies of Japan. *Bulletin of the Imperial Central Agricultural Experiment Station in Japan* 2: 85-165. [1919.02.??]
Munro, H.K. 1933. Records of South African fruit-flies (Trypetidae, Diptera) with descriptions of new species. *South Africa Department of Agriculture Entomology Memoirs* (1932) 8: 25-45. [1933.01.24]
Munro, H.K. 1935a. Records of Indian Trypetidae (Diptera) with descriptions of some apparently new species. *Records of the Indian Museum* 37: 15-27. [1935.04.02]
Munro, H.K. 1935b. Observations and comments on the Trypetidae of Formosa [concl.]. *Arbeiten über Physiologische und Angewandte Entomologie aus Berlin-Dahlem* 2: 253-271. [1935.12.21]
Munro, H.K. 1938. Studies on Indian Trypetidae (Diptera). *Records of the Indian Museum* 40: 21-37. [1938.04.??]
Munro, H.K. 1956. Contributions a l'etude de la faune entomologique du Ruanda-Urundi (Mission P. Basilewsky, 1953). CIV. Diptera Trypetidae. *Annales du Musée Royal du Congo Belge, Series in 8º, Sciences Zoologiques* 51: 462-474. [1956.12.??]
Munro, H.K. 1957. Trypetidae, pp. 853-1054. In: *Ruwenzori expedition 1934-1935*. Vol. 2, No. 9. British Museum (Natural History). [1957.03.??]
Norrbom, A.L. 2004. Updates to Biosystematic Database of World Diptera for Tephritidae through 1999. *Diptera data dissemination disk* (CD-ROM) 2.
Norrbom, A.L. 2006. A revision of the Neotropical genera *Molynocoelia* Giglio-Tos, *Pseudophorellia* Lima, and *Alujamyia*, n. gen. (Diptera: Tephritidae). Pp. 35-145. In: Freidberg, A. (ed.). *Biotaxonomy of Tephritoidea. Israel Journal of Entomology* 35-36: 1-599.
Norrbom, A.L., Carroll, L.E., Thompson, F.C., White, I.M. and Freidberg, A. 1999. Systematic database of names, pp. 65-251. In: Thompson, F.C. (ed.), *Fruit fly expert identification system and systematic information database*. *Myia* (1998) 9, vii + 524 pp. and *Diptera data dissemination disk* (CD-ROM) (1998) 1. [1999.02.22]
Osten Sacken, C.R. 1882. Diptera from the Philippine Islands brought home by Dr. Carl Semper [concl.]. *Berliner Entomologische Zeitschrift* 26: 187-252. [1882.12.??]
Permkam, S. and Hancock, D.L. 1995. Australian Ceratitinae (Diptera: Tephritidae). *Invertebrate Taxonomy* 8: 1325-1341. [1995.??.??]
Premlata and Singh, A. 1988. Description of two new species of genus *Acroceratitis* Hendel (Diptera: Tephritidae) from Chandigarh, India. *Journal of the Bombay Natural History Society* (1987) 84: 634-639. [1988.05.25]
Radhakrishnan, C. 2000. *Ichneumonopsis burmensis* Hardy (Tephritidae: Diptera: Insecta), a new record from India. *Records of the Zoological Survey of India* 98 (1): 203-204. [2000.??.??]

Rondani, C. 1875. Muscaria exotica Musei Civici Januensis. Fragmentum III. Species in Insula Bonae fortunae (Borneo), Provincia Sarawak, annis 1865-1868 lectae a March. J. Doria et Doct. O. Beccari. *Annali del Museo Civico di Storia Naturale, Genova* 7: 421-464. [1875.??.??]

Schiner, I.R. 1868. Diptera, vi + 388 pp. In: *Reise der österreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859, unter den Befehlen des Commodore B. von Wüllerstorf-Urbair*. Zoologischer Theil. Zweiter Band. 1. Abtheilung, [Sect.] B, [Art. I]. Karl Gerold's Sohn, Wien [= Vienna]. [1868.04.30]

Séguy, E. 1941. Diptères recueillis par M.L. Chopard d'Alger a la Côte d'Ivoire. *Annales de la Société Entomologique de France* (1940) 109: 109-130. [1941.03.15]

Shinji, O. 1939. On the Trypetidae of north-eastern Japan, with the description of new species. *Insect World (Gifu)* 43: 288-291. [1939.10.15]

Shinji, O. 1940a. 2 new species of fruit-flies from Japan. *Insect World (Gifu)* 44: 162-164. [1940.??.??]

Shinji, O. 1940b. 2 new species of Trypetidae from Japan. *Insect World (Gifu)* 44: 194-196. [1940.??.??]

Shiraki, T. 1933. A systematic study of Trypetidae in the Japanese Empire. Memoirs of the Faculty of Science and Agriculture, Taihoku Imperial University 8 (Entomol. 2): 509 pp. + Plates i-xiv [1933.07.30]

Shiraki, T. 1968. Fruit flies of the Ryukyu Islands (Diptera: Tephritidae). *United States National Museum Bulletin* 263: 104 pp. [1968.04.17]

Speiser, P.G.E. 1913. Beiträge zur Dipterenfauna von Kamerun. I. *Deutsche Entomologische Zeitschrift* 1913: 131-146. [1913.03.31]

Thompson, F.C. (ed.) 1999. *Fruit fly expert identification system and systematic information database. Myia* 9, ix + 524 pp.

Walker, F. 1856. Catalogue of the dipterous insects collected at Sarawak, Borneo, by Mr. A.R. Wallace, with descriptions of new species. *Journal of the Proceedings of the Linnean Society. Zoology*. London (1857) 1: 105-136. [1856.11.01]

Walker, F. 1860. Catalogue of the dipterous insects collected at Makessar in Celebes, by Mr. A.R. Wallace, with descriptions of new species [concl.]. *Journal of the Proceedings of the Linnean Society. Zoology*. London 4: 145-172. [1860.02.10]

Walker, F. 1861. Catalogue of the dipterous insects collected at Gilolo, Ternate, and Ceram, by Mrs. Wallace, with descriptions of new species. *Journal of the Proceedings of the Linnean Society. Zoology*. London 6: 4-23. [1861.11.01]

Wang, X.-J. 1992. Diptera: Tephritidae, pp. 1148-1153. In: Peng, J.-W. and Liu, Y.-Q., (eds.), *Iconography of forest insects in Hunan, China*. Academia Sinica and Hunan Forestry Institute, Hunan, China. 60 + 4 + 1473 p. [1992.02.??]

Wang, X.-J. 1998. The fruit flies (Diptera: Tephritidae) of the East Asian Region. *Acta Zootaxonomica Sinica* (1996) 21 (supplement): 338 pp. + 265 Figs. + Plates i-xli. [1998.??.??]

White, I.M., Headrick, D.H., Norrbom, A.L. and Carroll, L.E. 1999. Glossary. pp. 881-924. In: Aluja, M. and Norrbom, A.L. (eds.), *Fruit flies (Tephritidae): Phylogeny and evolution of behavior*, CRC (Boca Raton) [16+944 pp.] [1999.12.15]

Wiedemann, C.R.W. 1830. *Aussereuropaeische zweifluegelige* Insekten. Vol. 2. Schulz, Hamm. xii + 684 pp. [1830.??.??]

Zia, Y. 1937. Study on the Trypetidae or fruit-flies of China. *Sinensia* 8: 103-226. [1937.04.??]

Zia, Y. 1938. I. Subfamily Trypetinae, pp. 6-57. In: Zia, Y. and Chen, S.H., Trypetidae of North China. *Sinensia* 9(1-2): 1-180. [1938.01.??]

Zia, Y. 1955. On three new species of trypetid flies from South China and Viet-Nam. *Acta Zoologica Sinica* 7: 63-68. [1955.06.??]

Zia, Y. 1963. On two new species of Trypetidae from Yunnan. *Acta Zoologica Sinica* 15: 457-460. [1963.09.??]

Zia, Y. 1964. Notes on Chinese trypetid flies III. *Acta Zootaxonomica Sinica* 1: 42-54. [1964.07.??]