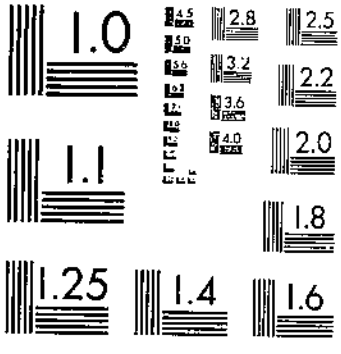
TB 1600 (1980) USDA TECHNICAL BULLETINS UPDATA

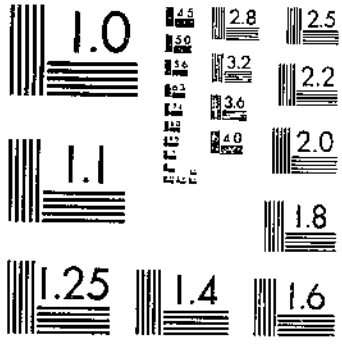
FRUIT FLY GENERA SOUTH OF THE UNITED STATES (DIPTERA, TEPHRITIDAE)

FOOTE, R H 1 OF 1

START



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

FRUIT FLY GENERA SOUTH OF THE UNITED STATES (Diptera: Tephritidae)

UNITED STATES DEPARTMENT OF AGRICULTURE

TECHNICAL BULLETIN NUMBER 1600

PREPARED BY SCIENCE AND EDUCATION ADMINISTRATION

FRUIT FLY GENERA SOUTH OF THE UNITED STATES (Diptera: Tephritidae)

by
RICHARD H. FOOTE

UNITED STATES DEPARTMENT OF AGRICULTURE

TECHNICAL BULLETIN NUMBER 1600

PREPARED BY SCIENCE AND EDUCATION ADMINISTRATION

ABSTRACT

Foote, Richard H. 1980. Fruit fly genera south of the United States. U.S. Department of Agriculture, Technical Bulletin 1600, 79 pp.

The 88 genera of fruit flies in Mexico, Central America, the West Indies, and South America are discussed. Keys to all genera are presented, and a synonymy, diagnosis, and discussion of each genus follow. Included for each genus is information about its distribution, its relationship to other genera, its composition in terms of the species belonging to it, aids to its recognition, and references for identifying its species. Several diagnostic characteristics and the wing of at least one species in almost every genus have been illustrated. Four genera, previously regarded as valid, have been synonymized with others, and three additional genera, long recorded from the region, are shown not to occur in the New World or to belong to other fly families. Fruit flies comprise the most economically important family of plant-inhabiting Diptera, considering the potential for agricultural damage by species of such genera as *Anastrepha*, *Ceratitis*, *Dacus*, and *Rhagoletis*. Used in conjunction with my catalog of Tephritidae published in 1967, this bulletin provides a means of identifying about two-thirds of the more than 600 species of fruit flies known to occur south of Texas and Florida.

KEYWORDS: Fruit flies, Tephritidae, Diptera, taxonomy, generic keys, South America, Central America, West Indies, Mexico.

ACKNOWLEDGMENTS

For the loan of general tephritid specimens critical to this study, I am indebted to the following individuals and institutions: Pastor Alayo D., Institute of Zoology, Havana, Cuba; Carlos G. Alonoca, Centro Regional de Investigacion Agropecuaria, La Molina, Peru; Paul H. Arnaud, Jr., California Academy of Sciences, San Francisco; Marion Buegler, University of California, Berkeley; George Byers, University of Kansas, Lawrence; Brian Cogan, British Museum (Natural History), London, England; Rául Córtes and Nelson Hitchens, Universidad del Norte, Arica, Chile; R. L. Fischer, University of Michigan, East Lansing; Saul Frommer, University of California, Riverside; Miguel Garcia, University of Havana, Cuba; Wilford Hanson, Utah State University, Logan; Norman Penny, Instituto Nacional de Pesquisas da Amazonia, Manaus, Brazil; Robert Schuster, University of California, Davis; Jose Tonoria, B. P. Bishop Museum, Honolulu, Hawaii; H. V. Weems, Jr., Florida Department of Agriculture and Consumer Services, Gainesville; and Pedro Wygodzinsky, American Museum of Natural History, New York, N.Y.

Special thanks go to Nelson Papavero, Museum of Zoology, University of São Paulo, Brazil, who facilitated my visit there to study types and general specimens; to Frank McAlpine, Canadian National Collection, Agriculture Canada, Ottawa, who arranged for me to survey the large collection of neotropical tephritids there and to borrow specimens; to Henry Dybas, who made possible a fruitful visit to the collections of the Field Museum, Chicago, Ill.; and to J. W. Ismay, Oxford University, England, who loaned the type-specimen of *Ischyropteron nigricaudatum* Bigot for study.

I am also grateful to F. L. Blanc, Sacramento, Calif., who selected specimens from several California collections for this study; and to D. Elmo Hardy, who freely made available his extensive knowledge of the oriental Tephritidae during this study. Frequent discussions with G. C. Steyskal, my colleague, proved to be especially useful in providing week-to-week guidance during the investigation.

Sandra Vincent, formerly of the Systematic Entomology Laboratory, aided my studies materially by recording morphological data on all the genera. The line drawings were executed by Ellen Paige, Washington, D.C.

CONTENTS

Issued May 1980

FRUIT FLY GENERA SOUTH OF THE UNITED STATES (Diptera: Tephritidae)

By RICHARD H. FOOTE, *research entomologist*[1]

The tephritid fauna of the Neotropical Region, with few exceptions, remained without any comprehensive review until two works by Hendel were published in 1914. The first one (Hendel *1914b*)[2] included the then-known 44 neotropical genera in a key to the genera of the world. Of these 44 genera, 16 were described as new. Following that publication, a revision of the neotropical Tephritidae (Hendel *1914c*) included a total of 53 genera with the same 16 genera, which appeared in the earlier work as new, also described as new in the later revision.

Until 1914, the tephritids occurring from Mexico through South America were known only by scattered descriptions of genera and species. Notable among the larger works was that of Wulp (*1899, 1900*), in which a number of Mexican genera and species were described and some previously described taxa were reviewed. The appearance of Hendel's two publications eventually awakened an interest in the neotropical fauna on the part of others. Curran reported several fruit flies from Puerto Rico and the Virgin Islands (Curran *1928, 1931*) and from British Guiana (Curran *1934a*), and he included a number of neotropical genera in his manual (Curran *1934b*). Concurrently Malloch (*1933*) reported on a large number of specimens in the British Museum (Natural History) collected in Patagonia and southern Chile, an interesting account, particularly of some of the Tephritinae of that area. In the same year, Lima began to review the Tephritidae of southern South America, and in a series of reports he presented a systematic accounting of the Trypetinae (Lima *1933, 1934a, b, c; 1935a, b; 1953a, b, c;* Lima and Leite *1952*). By far the most significant neotropical work on the family has been by Aczél of Tucumán, Argentina (Aczél *1949a, b; 1950; 1951; 1952a, b, c, d; 1953a, b, c; 1954a, b; 1955a, b, c; 1958*). He began his studies with the Trypetinae and was systematically studying the fruit flies at the genus and species levels subfamily by subfamily until his untimely death in 1959.

The most recent comprehensive work (Foote *1967*) catalogs the 117 genus-group and 818 species-group names (82 and 680 valid names, respectively) known through 1965 but leaves a rather large number of taxa unclassified. Since 1960, very few new taxa or nomenclatural changes have been reported in the literature, most of them contributed by Bush and Huettel (*1970*), Foote (*1960b, 1978*), Hardy (*1968*), Korytkowski (*1971*), Steyskal (*1970; 1972a, b, c, d; 1974; 1977a, b*), Steyskal and Foote (*1977*), and Stoltzfus (*1977*).

In this publication, 11 of the 82 genera cataloged in 1967 are no longer recognized. *Lucumaphila* Stone 1939, *Phobema* Aldrich 1925, and *Pseudodacus* Hendel 1914 were synonymized with *Anastrepha* Schiner by Steyskal (*1977a*), and *Rhagoletoides* Foote 1960 is a synonym of *Oedicarena* Loew (Steyskal and Foote *1977*). *Neanomoia* Hendel 1914 (inadvertently omitted from Foote *1967*) and *Hamouchaeta* Blanchard 1929 were synony-

[1]Systematic Entomology Laboratory, c/o U.S. National Museum, Washington, D.C. 20560.

[2]The year in italic after the author's name refers to Literature Cited, p. 51.

mized with *Anomoia* Walker by Hardy (*1973*). As a result of the present study, *Ictericodes* Hering 1942 is found not to occur in the Neotropical Region; *Neoacanthoneura* Hendel 1914 is assigned to the family Otitidae; and the genera *Melanotrypana* Hering 1944, *Neohexachaeta* Lima 1953, *Tomoplagiodes* Aczél 1954, and *Ceratitoedaspis* Aczél 1953 are assigned to synonymy.

On the other hand, 17 valid genera not previously included in the 1967 catalog have been added to the neotropical and Mexican fauna. The genus *Ensina* Robineau-Desvoidy was recorded by Steyskal, and four genera were described as new by Foote (*1978*). In the present study, eight genera in the Nearctic Region are shown to have ranges extending into Mexico and the West Indies (*Chetostoma* Rondani, *Gymnocarena* Hering, *Myoleja* Rondani, *Neaspilota* Osten Sacken, *Orellia* Robineau-Desvoidy, *Oxyna* Robineau-Desvoidy, *Procecidocharoides* Foote, and *Xenochaeta* Snow); three genera (*Anomoia* Walker, *Gonioxyna* Hendel, and *Goniurellia* Hendel) have never been reported previously from the New World; and the genus *Dacus* Fabricius was not previously included in my catalog because of its status as an introduced genus.

The objective of this study is to provide a current means for identifying the genera of Tephritidae occurring in the Neotropical Region. Since most revisionary work on the tephritids of the Nearctic Region does not include Mexico, this publication encompasses all the land areas of the New World from the northern border of Mexico and the southern tip of Florida south to Tierra del Fuego. Thus it pertains to the southernmost part of the Nearctic Region proper, by including all of Mexico, as well as to the entire Neotropical Region.

This bulletin presents a diagnosis for each subfamily and in each subfamily having New World tribes it gives a key to those tribes. The keys to genera have a similar distribution in that where no tribes are discussed, the generic key is placed with the diagnosis and discussion of the subfamily, but the generic key appears with the tribe wherever there is a diagnosis and discussion at that level. Following this treatment at the supergeneric level, all the genera are arranged alphabetically, each genus represented by its synonymy, diagnosis, and discussion.

The synonymies present all the important literature known to me at the generic level. The initial synonymic entry is a citation to the original description of the genus. A statement of its type-species and how it was designated follows. The subsequent synonymic entries for each name are annotated briefly so the reader can judge the nature of the information presented in any particular publication. A special attempt has been made to make the generic synonymies complete.

The diagnoses are nested in that the taxonomic characters discussed in the diagnosis of a subfamily or tribe are not usually repeated in the generic diagnosis. Many of the taxonomic characters themselves were selected on the basis of their proven value, whereas others were used in an attempt to develop a new means for identification. A total of 44 characters was originally used as the ordinate of a 2-dimensional matrix, in which the nature of all characters for all genera was recorded. This matrix was then used to develop all the diagnoses and keys.

The discussion of each taxon presents information on its salient taxonomic characters, its major relationships, a brief summary of the taxonomic work that has been accomplished, and for each genus a mention of where keys to species may be found. When used in conjunction with the available nearctic and neotropical catalogs (Foote *1965a, 1967*), the present publication should provide a guide for the identification of half to two-thirds of the known tephritid species of the New World.

Table 1 represents the distribution of each tephritid genus occurring south of the United States by zoogeographic region and by country and island group. It is immediately evident that the range of many of the genera has been extended as a result of this study.

The following list represents the suprageneric structure of the family given in this publication:

SUBFAMILIES, TRIBES, AND GENERA OF TEPHRITIDAE

Subfamily Dacinae
- *Dacus* Fabricius
- *Toxotrypana* Gerstäcker

Subfamily Myopitinae
- *Urophora* Robineau-Desvoidy

Subfamily Oedaspidinae
- *Cecidocharella* Hendel
- *Cecidochares* Bezzi
- *Dracontomyia* Becker
- *Neorhagoletis* Hendel
- *Ostracocoelia* Giglio-Tos
- *Procecidochares* Hendel
- *Procecidocharoides* Foote

Subfamily Trypetinae
- *Anastrepha* Schiner
- *Anomoia* Walker
- *Blepharoneura* Loew
- *Ceratitis* Macleay
- *Ceratodacus* Hendel
- *Chetostoma* Rondani
- *Cryptodacus* Hendel
- *Cryptoplagia* Aczél
- *Epochrinopsis* Hering
- *Gerrhoceras* Hering
- *Gymnocarena* Hering
- *Hawardina* Aczél
- *Hetschkomyia* Hendel
- *Hexachaeta* Loew
- *Hexaresta* Hering
- *Ischyropteron* Bigot
- *Lexca* Foote
- *Molynocoelia* Giglio-Tos
- *Myoleja* Rondani
- *Oedicarena* Loew
- *Parastenopa* Hendel
- *Polionota* Wulp
- *Pseudophorellia* Lima
- *Pyrgotoides* Curran
- *Rhagoletis* Loew
- *Rhagoletotrypeta* Aczél
- *Stoneola* Hering
- *Tomoplagia* Coquillett
- *Trypeta* Meigen
- *Zonosemata* Benjamin

Subfamily Tephritinae
- Tribe Terelliini
  - *Neaspilota* Osten Sacken
  - *Orellia* Robineau-Desvoidy
- Tribe Ditrichini
  - *Cryptotreta* Blanc and Foote
  - *Dictyotrypeta* Hendel
  - *Eutreta* Loew
  - *Laksyetsa* Foote
  - *Neorhabdochaeta* Malloch
  - *Paracantha* Coquillett
  - *Pseudeutreta* Hendel
  - *Rhachiptera* Bigot
  - *Strobelia* Rondani
- Tribe Platensinini
  - *Acrotaenia* Loew
  - *Acrotaeniacantha* Hering
  - *Caenoriata* Foote
  - *Neotaracia* Foote
  - *Pseudacrotaenia* Hendel
- Tribe Tephritini
  - *Acinia* Robineau-Desvoidy
  - *Baryplegma* Wulp
  - *Celidosphenella* Hendel
  - *Dioxyna* Frey
  - *Dyseuaresta* Hendel
  - *Ensina* Robineau-Desvoidy
  - *Euaresta* Loew
  - *Euarestoides* Benjamin
  - *Euarestopsis* Hering
  - *Gonioxyna* Hendel
  - *Goniurellia* Hendel
  - *Homoeothrix* Hering
  - *Lamproxyna* Hendel
  - *Lamproxynella* Hering
  - *Neotephritis* Hendel
  - *Oxyna* Robineau-Desvoidy
  - *Paroxyna* Hendel
  - *Plaumannimyia* Hering
  - *Protensina* Hendel
  - *Tephritis* Latreille
  - *Tetreuaresta* Hendel
  - *Trupanea* Schrank
  - *Trypanaresta* Hering
- Tribe "Aciurini"
  - *Aciurina* Curran
  - *Chrysaciura* Aczél
  - *Lilloaciura* Aczél
  - *Polymorphomyia* Snow
  - *Pseudoedaspis* Hendel
  - *Pseudopolionota* Lima
  - *Rhithrum* Hendel
  - *Xanthaciura* Hendel
  - *Xenochaeta* Snow

KEY TO SUBFAMILIES OF TEPHRITIDAE

1. Following bristles not present: Ocellar, dorsocentral, presutural, katepisternal, and usually humeral ---------- **Dacinae (p. 4)**
   These bristles never simultaneously lacking ---------- 2

2. All the following must be present: Basal cubital cell closed transversely (fig. 118), vein R4+5 bare above, 1 pair upper fronto-orbital bristles, 1 pair dorsocentral bristles ---------- Myopitinae (p. 5)
   Basal cubital cell drawn to postero-apical point (fig. 6), *or* vein R4+5 setose above, *or* more than 1 pair upper fronto-orbital bristles, *or* more than 1 pair dorsocentral bristles ---------- 3
3. Scutellum strongly swollen in lateral view, usually polished black; wing with crossbanded pattern, usually at least one of hyaline fasciae passing uninterrupted across wing disk from anterior to posterior margins (fig. 42); never with a number of small, irregularly shaped marks near base ---------- Oedaspidinae (p. 5)
   Scutellum flat or gently rounded (except in *Ceratitis*, in wing base of which are a number of small, irregularly shaped marks (fig. 48)), color various; wing pattern various ---------- 4
4. Postocular bristles slender, sharply pointed, black (fig. 7) (yellow if other body and head hairs are yellow); wings usually banded, usually without reticulation; basal cubital cell often with postero-apical elongation longer than width of cell at base of elongation (fig. 6); dorsocentral bristles usually situated near transverse line through supra-alar bristles, or posterior to it ---------- Trypetinae (p. 6)
   Postocular bristles entirely whitish and swollen (fig. 8), or mixed with slender, dark, sharply pointed ones (fig. 9); reticulation usually present in wing pattern, although bands or combination of both may be present (fig. 36); elongation of basal cubital cell usually little longer than maximum width of elongation at its base; dorsocentral bristles usually situated close to transverse suture, but if closer to supra-alars, never posterior to transverse line through them ---------- Tephritinae (p. 9)

Subfamily DACINAE

Diagnosis.—Frons and face meeting at distinct angle in lateral view; postoculars slender, dark, sharply pointed; frons haired; 0–2 pairs lower fronto-orbitals; 1 pair upper fronto-orbitals; ocellars very short, fine, and dark, or lacking; face usually with dark spots and with distinct carina; 3d antennal segment rounded apically; mouthparts never geniculate; 1 pair acrostichals; 1 pair anepisternals; 1 pair anepimerals; 2 pairs notopleurals; humerals, presuturals, dorsocentrals, and katepisternals absent; scutellum normally flat, 1 pair scutellars; no rows of ventral spines or setae on middle or hind legs; wing usually rather narrow, with banded pattern; vein r–m situated well apicad of middle of discal cell; posterior extension of basal cubital cell equal in length to, or longer than, basal part of cell; bullae absent.

Discussion.—The subfamily is easily recognized in the New World by the reduced chaetotaxy and other characters previously stated. It is represented in the New World by the one indigenous genus, *Toxotrypana* Gerstäcker. The genus *Dacus* is included here because of the occasional introduction of two of its species (see discussion of *Dacus*). The subfamily, treated extensively in numerous publications by D. E. Hardy and others, reaches its maximum development in the Oriental, Pacific, and Afrotropical Regions, where its members are the most economically important tephritids infesting fruit.

KEY TO GENERA OF DACINAE

1. Ovipositor sheath longer than abdomen; vein R2+3 undulate and with at least 1 short auxiliary vein anterior to vein R2+3; basal medial and basal cubital cells about same width (fig. 114) ---------- *Toxotrypana* Gerstäcker
   Ovipositor sheath much shorter than abdomen; vein R2+3 nearly straight, without auxiliary veins; basal medial cell distinctly wider than basal cubital cell (fig. 55) ---------- *Dacus* Fabricius

Subfamily MYOPITINAE

Diagnosis.—Postoculars slender, sharply pointed, black; frons bare; 2 pairs lower fronto-orbitals; 1 pair upper fronto-orbitals; ocellars well developed; face without distinct carina; antenna as long as, or shorter than, face, 3d antennal segment rounded apically, arista bare; 1 pair dorsocentrals, situated between transverse lines through supra-alars and postalars; 1 pair acrostichals; 1 pair presuturals; 2 pairs notopleurals; 1 pair anepisternals; 1 pair katepisternals, 1 pair anepimerals; 2 pairs scutellars; middle and hind femora and tibiae without ventral rows of bristles; wing either distinctly banded or hyaline, either with dark spots or streaks or only the veins darkened; vein r–m at or near middle of discal cell; basal cubital cell closed transversely without posterior extension of any kind; mouthparts sometimes geniculate; bullae absent.

Discussion.—Members of this subfamily may be recognized rather easily by the transverse nature of vein Cu2, which closes the basal cubital cell distally without any cell elongation whatever along the anal vein (fig. 118) although the additional characters given in the key must also be present. Some species of Tephritini have a rather similar basal cubital cell, but a slight extension of the cell along the anal vein is always detectable, and the wings are nearly always reticulate in those species rather than banded as in many of the species of Myopitinae. Although five or more genera are commonly recognized throughout the world, only one, *Urophora* Robineau-Desvoidy, is recognized in the New World. Several palaearctic species of this genus have been introduced into North America as candidates for the control of noxious weeds.

Subfamily OEDASPIDINAE

Diagnosis.—In lateral view, frons meeting face in curve without distinct angle, except in *Ostracocoelia* Giglio-Tos, in which these 2 surfaces meet at angle of about 90°; frons matte; 2–3 pairs lower fronto-orbitals; 1–2 pairs upper fronto-orbitals; ocellars well developed; antenna never longer than face, 3d segment rounded apically, arista bare; usually 1 pair dorsocentrals; acrostichals present; 2 pairs notopleurals, usually unicolorous; 1–3 pairs anepisternals; scutellum shiny black, swollen, 2 pairs scutellars; hind tibia usually devoid of anteroventral hairs or spines; wing pattern banded, wing of nearly all species with complete or nearly complete transverse hyaline fascia basally, at midwing, or between midwing and apex; vein R4+5 usually bare.

Discussion.—The most easily used characters for the recognition of members of this subfamily are the markedly swollen, shining scutellum (usually black) and the presence of banded wings with at least one of the hyaline fasciae in almost all the species extending uninterrupted from the anterior to the posterior margins. No attempt has been made in this study to distinguish between the tribes Oedaspidini and Cecidocharini discussed by Hering (*1947b*) or to assess their relationships to the New World fauna. Aczél (*1953a, p. 107*) discussed many of the neotropical genera and species in a rather thorough taxonomic revision. According to G. E. Bush (personal communication), most if not all the species form galls on a wide variety of plants.

KEY TO GENERA OF OEDASPIDINAE

1. Vein r–m situated at about middle of discal cell; veins r–m and dm–cu separated by transverse hyaline fascia, or vein r–m lying within fascia; 2 pairs upper fronto-orbital bristles 2

   Vein r–m situated distinctly apicad of middle of discal cell; veins r–m and dm–cu covered by dark transverse fascia; 1–2 pairs upper fronto-orbital bristles 5

2. All postocular bristles slender, black, sharply pointed; anal cell without pronounced anal lobe; palpi enlarged 3
   Some postocular bristles whitish, enlarged; distinct anal lobe present; palpi not enlarged 4
3. One pair dorsocentral bristles; stigma reduced in size; costal margin depressed immediately distad of subcostal cell (fig. 90); veins r–m and dm–cu separated by transverse hyaline fascia ..... *Ostracocoelia* Giglio-Tos
   Two pairs dorsocentral bristles; stigma normal in size; costa normally convex distad of subcostal cell; only vein r–m situated in transverse hyaline fascia ..... *Neorhagoletis* Hendel
4. Vein R2+3 terminating in costa at about level of vein r–m; wing membrane heavily thickened and blackened in area of subcostal cell; cell R no more than 2½ times as long as its width at apex of subcostal cell (fig. 58) ..... *Dracontomyia* Becker
   Vein R2+3 terminating in costa well beyond level of vein r–m; wing membrane normally thin in area of subcostal cell; cell R more than 3 times as long as its width at apex of subcostal cell (fig. 42) ..... *Cecidocharella* Hendel
5. One pair upper fronto-orbital bristles; postocular bristles inflated, whitish; transverse hyaline band of wing pattern subapical (fig. 96) ..... *Procecidochares* Hendel
   Two pairs upper fronto-orbital bristles; postocular bristles either black, slender, and sharply pointed, whitish and inflated, or mixture of 2 types; transverse hyaline fascia of wing pattern, if present, at basal ⅓ or at center of wing disk 6
6. One pair dorsocentral bristles; postocular bristles all black and slender, or mixed with whitish, inflated ones ..... *Cecidochares* Bezzi
   Two pairs dorsocentral bristles; all postocular bristles whitish, inflated ..... *Procecidocharoides* Foote

Subfamily TRYPETINAE

Diagnosis.—Head higher than long; mouthparts nongeniculate; postoculars slender, black, sharply pointed (yellow in those species with body bristles entirely yellow); frons prominently haired in most genera; 2–4 pairs lower fronto-orbitals; 1–2 pairs upper fronto-orbitals; upper fronto-orbitals concolorous; 1 pair dorsocentrals, situated from slightly anterior to transverse line through supra-alars to one through acrostichals; acrostichals usually present; 1 pair humerals; 1 pair presuturals; 2 pairs notopleurals; 1–2 pairs anepisternals; 1 pair katepisternals; 1 pair anepimerals (all these bristles generally same color); 1–4 pairs scutellars; wing pattern banded rather than reticulate; posterior extension of basal cubital cell usually rather long, always longer than width of extension at its base; bulla absent.

Discussion.—All the species placed here possess (1) relatively thin, black, sharply pointed postocular setae without white, stouter setae mixed with them (for example, see Tephritinae: Ditrichini) and (2) a more or less distinctly elongated basal cubital cell. Scapulars are usually, though not invariably, present. Hering (*1947b*) divides the subfamily into four tribes, whereas Hardy (*1973*) uses seven for the Trypetinae of Southeast Asia based on somewhat different criteria. In the present study, I have found the tribal characters used by both authors to be so unstable that I have not been able to define a tribal structure in the Trypetinae at this time. For instance, the genus *Molynocoelia* Giglio-Tos may well be the sole New World representative of the tribe Gastrozonini, but it lacks one of the gastrozonine characters specified by Hardy—i.e., a setose scutellum. Likewise, the genera *Hexaresta* Hering, *Hexachaeta* Loew, and *Blepharoneura* Loew very probably belong to the tribe Acanthonevrini, but an assignment to that tribe in my opinion should be held in abeyance until the affinities of the unusual forms represented by *Ceratodacus* Hendel, *Pyrgotoides* Curran, and

Ischyropteron Bigot can be determined. Another genus, *Ceratitis* Macleay, is variously placed in a tribe Ceratitini or in a subfamily Ceratitinae, but I follow Hardy (*1973*, *1974*) and others who argue that character overlapping destroys the limits of that tribe, at least in the Oriental and Pacific Regions. The assemblage of genera and the way they are keyed presented here differ considerably from treatments of the New World fauna presented by other authors. By and large, members of this subfamily infest fleshy fruit of various plants rather than seeds or other plant parts, accounting for the fact that this subfamily contains most of the fruit flies of greatest economic importance in the New World.

KEY TO GENERA OF TRYPETINAE

1. Three pairs scutellar bristles 2
   One or 2 pairs scutellar bristles 6
2. Arista white, bare, thickened along almost its entire length (fig. 19); vein r–m situated near base of discal cell ..... *Ceratodacus* Hendel
   Arista bristlelike, slender, dark, usually distinctly haired; vein r–m situated near midpoint of discal cell or beyond 3
3. All tibiae, especially those of hind legs, swollen and densely covered with fine hairs (fig. 10); head and body bristles very short; abdominal terga bare except laterally ..... *Pyrgotoides* Curran
   Tibiae not unusually swollen or densely haired; head and body bristles of normal length; abdominal terga with evenly distributed, distinct setae 4
4. Arista moderately long haired, longest hairs longer than width of arista; ocellar bristle poorly developed, at most little longer than longest postocular ..... *Hexaresta* Hering
   Arista with shorter hairs; ocellar bristle strongly developed 5
5. Veins CuA2 and A with setae dorsally; in lateral view, middle third or half of parafacial hidden behind anterior margin of compound eye (fig. 17); anterior upper fronto-orbital bristle situated anterior to ⅓ distance between anterior ocellar triangle margin and antennal base ..... *Blepharoneura* Loew
   Veins CuA2 and A bare dorsally; entire length of parafacial visible in lateral view; anterior fronto-orbital bristle situated posterior to ⅓ distance between anterior ocellar triangle margin and antennal base ..... *Hexachaeta* Loew
6. Antenna distinctly longer than face (fig. 12) 7
   Antenna no longer than face, usually shorter 8
7. Three pairs upper fronto-orbital bristles; arista long haired, longest hairs longer than longest postorbital bristles (fig. 12) ..... *Molynocoelia* Giglio-Tos
   Two pairs upper fronto-orbital bristles; arista with hairs no longer than diameter of aristal shaft ..... *Lezca* Foote
8. Two pairs dorsocentral bristles, 1 anterior to suture; 4–5 pairs lower fronto-orbital bristles (fig. 30) ..... *Polionota* Wulp
   One pair dorsocentral bristles, posterior to suture; 2–3 pairs lower fronto-orbital bristles 9
9. Vein R4+5 curved anteriorly at apical margin of wing (figs. 6, 38) ..... *Anastrepha* Schiner
   Vein R4+5 entering apical wing margin without anterior curve 10
10. Ocellar bristle little longer or heavier than longest postocular bristle (fig. 13) 11
    Ocellar bristle well developed, distinctly longer and heavier than longest postocular bristle 14
11. Subcostal cell foreshortened, distinctly wider than long; arista distinctly haired; wing with large dark area at center (fig. 93) ..... *Parastenopa* Hendel
    Subcostal cell at least as long as greatest width, usually distinctly longer; arista bare or indistinctly haired; wing pattern various 12

12. Head and scutum heavily pollinose; lunule large, usually sunken below anterior margin of parafacial; parafacial at least half as wide as compound eye in lateral view (fig. 24) ..... *Gerrhoceras* Hering
Pollinosity of head and scutum various; lunule not unusually enlarged, lying flush with surface of frons; parafacial narrower than half width of compound eye 13
13. Two pairs upper fronto-orbital bristles; arista bare; wing pattern various ..... *Myoleja* Rondani
Three pairs upper fronto-orbital bristles; arista haired; apical half of wing mostly hyaline, with narrow, dark, C-shaped band (fig. 39) ..... *Anomoia* Walker
14. Acrostichal bristles absent; 1 pair upper fronto-orbital bristles 15
Acrostichal bristles present; 2 pairs upper fronto-orbital bristles 17
15. Wing hyaline basally, evenly dark apicad of vein dm–cu; vein r–m proximad of middle of discal cell ..... *Ischyropteron* Bigot
Wing pattern covering most of disk; vein r–m situated distad of middle of discal cell 16
16. Two pairs lower fronto-orbital bristles; arista bare; vein R4+5 bare; middle and hind femora lacking rows of outstanding setae or spines ..... *Hetschkomyia* Hendel
Three pairs lower fronto-orbital bristles; arista haired; vein R4+5 haired; middle and hind femora each with prominent row of spines ..... *Pseudophorellia* Lima
17. Third antennal segment with dorso-apical point (fig. 14) 18
Third antennal segment rounded apically 21
18. One or 2 pairs upper fronto-orbital bristles (if posterior pair present, they are very short); veins r–m and dm–cu close together and covered by same transverse brown band (fig. 74) ..... *Haywardina* Aczél
Two pairs well-developed upper fronto-orbital bristles; vein r–m situated at least its own length from vein dm–cu 19
19. Wing without short marginal brown mark in opening of S-shaped band (fig. 53) ..... *Cryptoplagia* Aczél
Wing pattern various, but if S-shaped band present, so also is short marginal brown mark in one of its openings 20
20. Dorsocentral bristle closer to transverse line through anterior supra-alars than to one through postalars; body black with yellow and white markings, or yellow with contrasting dark marks ..... *Rhagoletis* Loew (part)
Dorsocentral bristle closer to transverse line through postalars than to one through anterior supra-alars; body yellow with both black and creamy white markings ..... *Zonosemata* Benjamin
21. Scutum with white or yellowish streak broadening posteriorly to scutoscutellar suture ..... *Rhagoletotrypeta* Aczél
Scutum without such light streak 22
22. Wing irregularly crossbanded, especially apicalmost bands with distinct light spots (fig. 63) ..... *Epochrinopsis* Hering
Wing spotted or banded (if latter, bands without light spots) 23
23. Slightly curved dark band with darkened margins running diagonally from subcostal cell to posterior wing margin; veins r–m and dm–cu lying at distinct angle to each other (fig. 52) ..... *Cryptodacus* Hendel
Wing pattern otherwise; veins r–m and dm–cu more or less parallel 24
24. Dorsocentral bristles situated closer to suture than to transverse line through supra-alar bristles ..... *Tomoplagia* Coquillett
Dorsocentral bristles at most only slightly ahead of transverse line through supra-alars, or farther back 25
25. Dorsocentral bristles situated distinctly behind transverse line through supra-alars ..... *Oedicarena* Loew
Dorsocentral bristles in, or nearly in, transverse line through supra-alars 26
26. Facial carina absent 27
Facial carina present 29
27. Posterior extension of basal cubital cell expanded basad of apex (fig. 15); scutellum swollen, partly shining black ..... *Ceratitis* Macleay
Posterior extension of basal cubital cell narrowing gradually to apex; scutellum normally shaped, yellowish 28

28. Oral margin anterior to genal bristle with several black bristles larger and distinctly longer than longest postocular (fig. 20) ..... *Chetostoma* Rondani
Bristles anterior to genal bristle, if present, light in color and/or finer and shorter than postoculars (fig. 33) ..... *Trypeta* Meigen
29. Middle and hind femora without rows of prominent anteroventral or posteroventral spines ..... *Stoneola* Hering
Middle and hind femora with rows of prominent anteroventral and posteroventral spines 30
30. Vein r–m situated distinctly apicad of middle of discal cell (fig. 73); most body and head bristles yellow ..... *Gymnocarena* Hering
Vein r–m situated at or very close to middle of discal cell (fig. 103); most head and body bristles black ..... *Rhagoletis* Loew (part)

Subfamily TEPHRITINAE

Diagnosis.—In lateral view, head usually slightly to distinctly higher than long; face and frons usually matte; face without distinct carina; 1–5 pairs lower fronto-orbitals; 1–3 pairs upper fronto-orbitals, posterior pair often light colored; ocellars well developed; all postoculars white, expanded in diameter, or mixed with black, slender ones, never all black; antenna never longer than face, 3d segment rounded apically, arista bare; usually 1 pair dorsocentrals, situated between transverse suture and transverse line through supra-alars; 1 pair humerals; 1 pair presuturals; 2 pairs notopleurals, posterior pair often light colored; 1 pair acrostichals; 1–2 pairs anepisternals; 1 pair katepisternals; 1 pair anepimerals; scutellum normally shaped, 1–2 pairs scutellars; abdominal tergum matte to shining; wing pattern never with appearance of bands unless reticulation is present; posterior elongation of cubital cell usually short, rarely longer than its own width at base.

Discussion.—In contrast to the trypetines, most of the species of this subfamily possess postoculars that are mixed black and white or comprise only the whitish, expanded type of setae in addition to other significant characters expressed in the key to subfamilies and the diagnosis previously presented. The distinctions between these two subfamilies are clear except in a few Tephritinae, in which all the postoculars are dark, whereas all other characters indicate a clear tephritine relationship. Hering (*1947b*) used five tribes, of which three are in the present study. Hardy (*1973*) indicated that four tribes are represented in Southeast Asia, three of which are clearly represented in the New World. In addition, the tribe Terelliini is included here. Hering's subfamily Aciurinae is represented in the New World by species that I have assigned tentatively to the "Aciurini" (see discussion of that tribe). Very few species of Tephritinae use fleshy fruit as a food source, employing instead other parts of their plant hosts.

KEY TO TRIBES OF TEPHRITINAE

1. Head and body yellowish; scutum broadly black, black area almost entirely obscured by white dusting; posterior upper fronto-orbital bristles convergent; dorsocentral bristle in transverse line through supra-alars ... Terelliini (p. 10)
Color of head and body various; scutum differently ornamented; posterior upper fronto-orbital bristles reclinate or divergent; dorsocentral bristles usually anterior to transverse line through supra-alars 2
2. Both of following must be present: Postocular bristles mixed dark and white (fig. 9); dark spot (sometimes faint) on parafacial between eye and antennal base (figs. 23, 29); antennal bases often distinctly separated ..... Ditrichini (p. 10)
Postocular bristles white, expanded (fig. 8), or more slender and yellowish, *or* dark spot between eye and antennal bases on parafacial absent; antennal bases rarely distinctly separated 3

3. In lateral view, outline of head oval, frons and face curving into each other without visible angle (fig. 22); wing usually broad, reticulate in basal half or third, or dark with yellowish spots, sometimes with dark or light bands in addition (fig. 36) ---------- **Platensinini** (p. 12)
   In lateral view, face and frons meeting at angle (fig. 33), even if obtuse; wing usually rather narrow, either banded or reticulate, or both ---------- 4
4. Wing usually not predominantly dark, but if so, apical stellate mark (fig. 115) usually present, wing never with dark transverse bands unless they are reticulated; abdominal terga usually gray or brown, matte or shining (if shining, mouthparts distinctly geniculate (fig. 32)); scutum matte; in lateral view, frons and face meeting at rather distinct angle rarely exceeding 120° (fig. 27) (if more than 120° or rounded, frons swollen immediately before lunule (fig. 22)) ---------- **Tephritini** (p. 13)
   Wing predominantly dark with yellow or hyaline spots (fig. 119), or with dark marks or transverse dark fasciae on hyaline disk; abdominal terga, at least apical one, shining; black or with combination of several colors; scutum sometimes shining or subshining; in lateral view, meeting of frons and face variable ---------- "Aciurini" (p. 16)

Tribe TERELLIINI

Diagnosis.—Head about as long as high in lateral view; postoculars light colored; frons matte; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, posterior pair distinctly convergent, 2 pairs concolorous; face without carina, unspotted; gena, face, and parafacial subshining; mouthparts never geniculate; antenna shorter than face, 3d antennal segment rounded apically, arista bare; scutum with shiny black surface almost completely obscured in undamaged specimens by dense white pollen; 1 pair dorsocentrals, situated in or very close to transverse line through supra-alars; 1 pair presuturals; 2 pairs notopleurals; 2 pairs anepisternals; 1 pair katepisternals; 1 pair anepimerals (all these bristles concolorous); scutellum matte to subshining, 2 pairs scutellars, posterior pair nearly as long as anterior; row of short, slender setae only on hind tibia; vein r–m situated distinctly apicad of middle of discal cell; abdominal tergum subshining, yellow to brown, often with black marks laterally.

Discussion.—Species belonging to this tribe are distinguished by convergent upper fronto-orbital bristles and the distinctive scutal pattern described in the key and diagnosis of the tribe. Whether these two characters justify the use of a tribal designation remains to be seen as a result of a study of the world's fauna. As far as I am aware, the tribe occurs only in the Palaearctic Region and on the North American continent no farther south than Mexico.

KEY TO GENERA OF TERELLIINI

1. One to several setae at node; frons bare; wing rarely less than 4 mm long (fig. 89) ---------- *Orellia* Robineau-Desvoidy
   Node bare; frons haired; wing rarely as long as 4 mm (fig. 83) ---------- *Neaspilota* Osten Sacken

Tribe DITRICHINI

Diagnosis.—In lateral view, face and frons meeting at distinct angle greater than 90°; head higher than long; mouthparts never geniculate; face usually without distinct carina, sometimes shining and with distinct spots; commonly 3 pairs lower fronto-orbitals;

2–3 pairs upper fronto-orbitals; ocellars well developed; postocular setae mixed black and white; parafrontal with dark spot between antennal base and anterior margin of eye; antenna never longer than face, 3d segment sometimes concave on dorsal margin and drawn to distinct point, arista bare, antennal bases characteristically (but not always) distinctly separated; scutum matte; 1 pair dorsocentrals, situated between transverse suture and transverse line through supra-alars; 1 pair acrostichals; 1 pair presuturals; 2 pairs notopleurals, posterior pair nearly always whitish; 1–2 pairs anepisternals; 1 pair katepisternals; 1 pair anepimerals; scutellum normally shaped, never swollen, usually 2 pairs scutellars; wing pattern usually reticulate, sometimes with hyaline or dark fasciae in addition; subcostal cell always darkened, longer than wide but never long and slender; vein r–m at or near middle of discal cell.

Discussion.—Included here are the tephritines having mixed dark and white postocculars and a rather distinct dark spot on the parafacial between the eye and the base of the antenna. Some authors have indicated that the widely separated antennal bases is a significant character, but I have found it to be not consistently present in the tribe, and widely separated antennae appear frequently elsewhere in the family. *Paracantha* Coquillett, *Neorhabdochaeta* Malloch, and *Laksyetsa* Foote form a distinct subset of this tribe. In many ways these three genera resemble *Rhabdochaeta* de Meijere and its close congeners and thus perhaps should be placed in Schistopterinae. However, the species of *Paracantha* show very little resemblance to *Schistopterum moebiusi* Becker, having many more characters in common with other Tephritinae. I fully agree with H. K. Munro (personal communication) that the entire subfamily Schistopterinae requires a thorough investigation on a world basis. Relatively little is known about the hosts or biology of the ditrichines.

KEY TO GENERA OF DITRICHINI

1. One pair scutellar bristles; wing broadly oval, extensively dark 2
   Two pairs scutellar bristles; wing narrow or broad, pattern various 3
2. Wing with discrete, sharply bordered hyaline spots and marginal incisions (figs. 59–62); bulla prominent; 2 pairs lower fronto-orbital bristles ..... ***Dyseuaresta*** Hendel (part)
   Wing with apical or preapical hyaline arc and hyaline incisions in cell 2d C (fig. 99); bulla absent; 3 pairs lower fronto-orbital bristles ..... ***Pseudeutreta*** Hendel
3. Parafrontals, parafacials, much of frons, and all of face shining, usually yellow 4
   These head areas matte 8
4. Two pairs dark lower fronto-orbital bristles, never a third, light-colored one anterior to them 5
   Three pairs lower fronto-orbital bristles, anterior pair usually light colored 6
5. Wing very narrow, posterior border straight and area anterior to it hyaline; vein r–m lying at distinct angle to vein dm–cu (fig. 102) ..... ***Rhachiptera*** Bigot
   Wing oval, posterior margin convex, wing field dark to posterior margin; vein dm–cu curved, line drawn through its 2 ends nearly parallel with vein r–m (fig. 107) ..... ***Strobelia*** Rondani
6. Dorsocentral bristles closer to transverse line through supra-alar bristles than to suture; anterior upper fronto-orbital bristle short, never situated anterior to posterior lower fronto-orbital bristle; apical half of wing more or less evenly dark ..... ***Laksyetsa*** Foote
   Dorsocentral bristle closer to suture than to transverse line through supra-alar bristles; anterior upper fronto-orbital bristle long, always mesad and anterior to posterior lower fronto-orbital bristle; apical half or third of wing with narrow dark rays radiating to margin 7

7. Lunule continued to prominent cone between and below antennal bases; dorsocentral bristle very close to suture; dark rays radiating from center of cell R5 to wing apex; bulla concolorous with light brown surrounding it (fig. 84) ..... *Neorhabdochaeta* Malloch

   Lunule between and below antennal bases with at most slight swelling; dorsocentral bristles somewhat removed from suture; dark rays of wing radiating from apical third of cell R5; bulla usually darker than surrounding dark color (fig. 92) ..... *Paracantha* Coquillett

8. Apex of wing dark or with small, rounded hyaline spots (fig. 56) ..... *Dictyotrypeta* Hendel

   Apex of wing with extensive hyaline area, often in form of arc 9

9. Frons bare; bulla present; vein R4+5 haired below, if only at base; hyaline marks present immediately distad of subcostal cell in cell R1 (fig. 54) ..... *Cryptotreta* Blanc and Foote

   Frons haired; bulla absent; vein R4+5 haired above; at most yellowish cloud immediately distad of subcostal cell in cell R1 (fig. 69) ..... *Eutreta* Loew

Tribe PLATENSININI

Diagnosis.—In lateral view, head oval, usually distinctly higher than long with face smoothly curving into frons or meeting at angle of greater than 130°; frons and face matte; face usually without carina; postoculars white, expanded in diameter, in a few specimens mixed with fine black hairs; 3 or more pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars usually moderately well developed; antenna shorter than face, 3d segment rounded apically, arista slender, bare; mouthparts never geniculate, labella fleshy; scutum matte; usually 1 pair dorsocentrals, situated close to transverse suture; 1 pair humerals; 1 pair presuturals; 2 pairs notopleurals, both same color; 2 pairs anepisternals; 1 pair katepisternals; 1 pair anepimerals (all these bristles same color); scutellum matte to subshining, 2 pairs scutellars; usually row of delicate bristles or outstanding hairs on hind tibia; wing rather broad, disk generally dark with lighter markings; subcostal cell short and wide; vein R1 curving rather abruptly to costa; either or both veins R2+3 and R4+5 sinuate or with pronounced curve; vein R4+5 haired above, in some species below as well; abdominal tergum subshining.

Discussion.—The wings of all platensine genera are broad, usually with hyaline spots at least in the basal one-half or one-third of the dark field. A lateral view of the head shows it to be distinctly higher than long with the frons rounded into the face without any angle, or with only a very obtuse one, at the antennal bases, producing a distinctly long-oval outline. All the genera included here are assignable to the tribe without reservation except *Tetreuaresta* Hendel, which has a broad wing and long-oval head but which more closely resembles other genera of Tephritini. No review of the New World genera and species has ever been published. Almost nothing is known about the biology or hosts of these flies in the area covered by this study.

KEY TO GENERA OF PLATENSININI

1. Apical ⅓ to ½ of wing with brown and/or hyaline rays diagonally from posterior border of cell M, in addition to other markings basally (figs. 36, 85) 2

   Wing with dark rays radiating to wing margin from center or apical ⅓ of cell R5 (see fig. 37) 3

2. Several large, prominent bullae occupying cell 2d C, subcostal cell, and part of cell R1; apical half of wing light brown, basal half with numerous yellow or hyaline spots (fig. 36) ---------- *Acrotaenia* Loew
   Bullae absent from those cells, 1 hyaline incision at apex of costa, 1 at apex of R2+3, intervening costa bowed anteriorly and entirely dark; dark areas of wing unicolorous brown (fig. 85) ---------- *Neotaracia* Foote
3. Posterior lower fronto-orbital and anterior upper fronto-orbital bristles well separated; dark areas of wing unicolorous ---------- 4
   Anterior upper fronto-orbital bristle very close to, even with, or anterior to posterior lower fronto-orbital bristle; dark areas of wing several shades of brown ---------- 5
4. One pair dorsocentral bristles, postsutural; wing disk with bright, distinctly bordered hyaline spots and incisions (fig. 112) ---------- *Tetreuaresta* Hendel (part)
   Two pairs dorsocentrals, 1 of pairs presutural; wing disk with vaguely delimited lighter brown spots in dark-brown field (fig. 41) ---------- *Caenoriata* Foote
5. Distinct bulla present at junction of veins M and dm–cu; cell 2d C and basal half of wing disk with numerous small spots (fig. 37)---------- *Acrotaeniacantha* Hering
   Bulla absent; cell 2d C with wide, dark, transverse band; wing with 6–12 oval hyaline spots, many of them bordered with darker brown (fig. 98) ---------- *Pseudacrotaenia* Hendel

Tribe TEPHRITINI

Diagnosis.—In lateral view, head generally slightly higher than long, often giving appearance of being square in profile; face meeting frons at distinct angle, usually about 90°–110°; postoculars always white and enlarged in diameter; 1–5 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, posterior pair light colored in all but a very few species; ocellars well developed; antenna as long as, or shorter than, face, 3d segment relatively short and broad, rounded apically, arista bare; mouthparts short- or long-geniculate, or labella fleshy; 1 pair dorsocentrals in all but 1 genus, always situated at or very close to transverse suture; 1 pair humerals, 1 pair presuturals; 2 pairs notopleurals, posterior pair commonly light colored; 1–2 pairs anepisternals, both pairs commonly dark; 1 pair katepisternals and 1 pair anepimerals, both usually light colored; scutellum never swollen, usually matte, 1–2 pairs scutellars; middle and hind legs commonly without rows of spines or outstanding setae; wing pattern never banded; vein r–m usually situated apicad of middle of discal cell but rarely closer to vein dm–cu than length of r–m; veins R2+3 and R4+5 never markedly sinuate, latter haired dorsally in some species and ventrally rarely; posterior extension of basal cubital cell usually rather short; bulla usually absent.

Discussion.—Most of the species of Tephritini can be recognized by their relatively small size, matte thorax and abdomen, generally reticulated wings, and the placement of the dorsocentral bristles, which are close to the transverse suture. Most of the species possess white upper fronto-orbitals and white posterior notopleurals (the other of the two bristle pairs dark). In the New World and the Palaearctic Region there are relatively few really distinctive genera, most of the species resembling each other closely or the genera intergrading in so many characters that one is tempted to assign them to a single genus with various subgenera, species groups, etc. Techniques involving other than simple observation of currently employed morphological characters must be brought to bear before one can resegregate these closely similar aggregations of species into sensible groups above the species level. For instance, see discussion of the genus *Celidosphenella*. No up-to-date, comprehensive review of the New World genera and species is available. Nearly all species of which their biology is known infest the seeds of Compositae or closely related plants.

KEY TO GENERA OF TEPHRITINI

1. One pair scutellar bristles 2
   Two pairs scutellar bristles 9
2. Two pairs lower fronto-orbital bristles 3
   Three or more pairs lower fronto-orbital bristles 7
3. Head nearly as long as, to longer than, high; parafacial relatively wide; mouthparts usually distinctly geniculate 4
   Head higher than long; parafacial usually narrow; mouthparts at most short-geniculate or labella fleshy 5
4. Subcostal cell usually with rounded hyaline spot; 3 hyaline spots usually occupying cell R1 immediately distad of subcostal cell (fig. 108); head usually about as long as high, rarely higher than long (fig. 32) ..... *Paroxyna* Hendel (part)
   Subcostal cell often entirely dark; 2–3 hyaline spots occupying cell R1 immediately distad of subcostal cell; head usually longer than high ... *Dioxyna* Frey
5. Wing with dark preapical stellate mark, with narrow dark rays to anterior, apical, and posterior margins, and often various dark markings in basal half of disk (fig. 115); frons bare ..... *Trupanea* Schrank (part)
   Wing pattern otherwise; frons haired 6
6. Cell R5 dark at tip or with only small hyaline spot apically (fig. 78), bulla absent; abdominal terga subshining black ..... *Lamproxynella* Hering
   Cell R5 usually with broad hyaline apical spot (figs. 59–62), bulla present; abdominal terga subshining to matte ..... *Dyseuaresta* Hendel (part)
7. Mouthparts long-geniculate; abdominal tergum shining black ... *Lamproxyna* Hendel
   Mouthparts at most short-geniculate, labella often fleshy; abdominal terga subshining or matte 8
8. Wing with dark preapical stellate mark with narrow dark rays to anterior, apical, and posterior margins, and few or no dark basal markings (fig. 115) ..... *Trupanea* Schrank (part)
   Wing disk broadly dark, broken by relatively few hyaline incisions and discal spots, or large quadrate or subquadrate hyaline area immediately distad of subcostal cell, sometimes with 1 or 2 dark costal marks near its center, and apices of veins R4+5 and M with dark marks or forming rays to preapical dark area, or apex almost entirely dark (figs. 44–47) ..... *Celidosphenella* Hendel
9. Mouthparts distinctly geniculate; 1 pair dark, slender lower fronto-orbital bristles, although stouter yellowish or white ones may be present (fig. 28) ..... *Oxyna* Robineau-Desvoidy
   Mouthparts geniculate or not; 2 or more pairs dark, slender lower fronto-orbital bristles 10
10. Two pairs lower fronto-orbital bristles 11
    Three or more pairs lower fronto-orbital bristles 18
11. Cell R1 extremely wide at level of apex of subcostal cell, with large bullalike black spot enveloping subcostal cell and basal half of cell R1, subcostal cell with straight posterior border (fig. 71) ..... *Gonioxyna* Hendel
    Cells R1 and R2+3 about same width at level of apex of subcostal cell, subcostal cell and basal half of cell R1 without such black spot; posterior border of subcostal cell usually rounded 12
12. Wing with dark-brown or yellow preapical stellate mark as in "typical" *Trupanea* species, sometimes with other dark brown or yellow marks basally 13
    Wing more or less evenly reticulate preapically, although distinct preapical dark spot may be present 15
13. Frons bare; wing never with distinct bulla ..... *Tephritis* Latreille (part)
    Frons haired; wing often with bulla 14
14. Basal ⅔ of wing yellowish, or with irregular dark markings, or both (fig. 116); head and body brown to yellow; all head and body bristles brown to yellow, never black ..... *Trypanaresta* Hering

Preapical stellate mark connected to stigma by broad dark band which rarely extends basad of vein Sc; hyaline wedge from subcostal cell terminating in vein R2+3, or beyond in form of small hyaline droplet (fig. 72); head and body brown to dark brown; head and body bristles usually black ---------- *Goniurellia* Hendel

15. Head nearly as long as high (fig. 32); parafacial relatively wide; mouthparts usually distinctly geniculate; subcostal cell often with rounded yellowish spot; 3 rather distinct hyaline spots occupying cell R1 immediately distad of subcostal cell; apex of cell R5 dark or with rounded subapical hyaline spot (fig. 108) ---------- *Paroxyna* Hendel (part)

Head usually higher than long; parafacial relatively narrow; labella fleshy, or at most mouthparts short-geniculate; wing markings various ---------- 16

16. In lateral view, frons swollen anteriorly, usually meeting face at angle greater than 90° (fig. 22); fore femur of male distinctly enlarged; external genitalia of male with conspicuous striations in anal region ----- *Euaresta* Loew

In lateral view, frons rather flat, usually meeting face at distinct angle of not much more than 90°; male without characters cited above ---------- 17

17. Wing evenly reticulate; subcostal cell yellowish or hyaline basally and apically (fig. 94) ---------- *Plaumannimyia* Hering

Dark bar about as wide as length of subcostal cell covering subcostal cell and extending posteriorly at least to vein R2+3, sometimes beyond; subcostal cell dark, sometimes with rounded yellowish or hyaline spot (figs. 109–111) ---------- *Tephritis* Latreille (part)

18. One pair upper fronto-orbital bristles; mouthparts long-geniculate; head distinctly longer than high; wing disk hyaline, or with dark markings, or infumated, with indistinct lighter spots; antennal bases separated by distinct facial carina ---------- 19

Two pairs upper fronto-orbital bristles; labella fleshy, or mouthparts short-geniculate; head at least as high as long, usually higher; wing disk with contrasting dark and hyaline areas; antennal bases usually closely approximate ---------- 20

19. Head about 1.2 times as long as high (fig. 21); in profile, anterior border of parafacial longer than ½ length of frons ---------- *Ensina* Robineau-Desvoidy

Head more than 1.2 times as long as high (fig. 31); anterior border of parafacial less than ½ as long as frons ---------- *Protensina* Hendel

20. Wing disk yellowish, with many of hyaline spots narrowly ringed with darker yellow or brown; all head and body bristles yellow ---------- 21

Wing pattern otherwise; at least some of body bristles dark brown or black -- 22

21. Apex of cell R3 dark or with only small hyaline spot (fig. 34); scutellum entirely yellow; vein R4+5 bare or haired at base ---- *Acinia* Robineau-Desvoidy

Apex of cell R3 broadly hyaline; scutellum with pair of lateral black spots; vein R4+5 haired ---------- *Baryplegma* Wulp

22. Wing with dark areas more extensive than hyaline ones; in lateral view, frons and face meeting in curve, or at angle exceeding 120° ---------- 23

Wing disk equally light and dark, or more extensively hyaline than dark; in lateral view, frons and face meeting at angle of less than 120° ---------- 24

23. One pair dorsocentral bristles, postsutural; frons flat -------- *Tetreuaresta* Hendel

Two pairs dorsocentral bristles, 1 of them presutural; frons with median ridge along entire length ---------- *Euarestopsis* Hering

24. Vein R4+5 with rather long slender hairs ventrally to beyond vein dm–cu, and haired dorsally to at least same extent ---------- *Homoeothrix* Hering

Vein R4+5 haired ventrally but rarely ever beyond vein r–m; dorsally bare or with hairs only at base ---------- 25

25. Wing disk primarily hyaline with preapical stellate mark as in *Trupanea* and many dark markings in basal half of disk, or yellow markings basally; subcostal cell light yellow, without darker markings; vein R4+5 bare above and below (fig. 67) ---------- *Euarestoides* Benjamin

Wing disk essentially dark, with numerous hyaline spots; stigma dark with 1 or more light yellow spots (figs. 86, 87); vein R4+5 bare above and below, or at most 1–2 hairs dorsally and several not extending beyond vein r–m ventrally ---------- *Neotephritis* Hendel

Tribe "ACIURINI"

Diagnosis.—In lateral view, head higher than long; face and frons matte to subshining; face never spotted, rarely with carina; postocular row always containing white, expanded setae although they may be mixed with shorter dark ones; 2–3 pairs lower fronto-orbitals; 1–2 pairs upper fronto-orbitals; ocellars well developed; mouthparts never geniculate; antenna shorter than face, 3d segment almost always rounded apically, arista bare; scutum matte to shining; usually 1 pair dorsocentrals, situated anterior to transverse line through supra-alars and often close to transverse suture; 1 pair acrostichals; 1 pair presuturals; 2 pairs notopleurals; 1–2 pairs anepisternals; 1 pair katepisternals; 1 pair anepimerals; scutellum usually matte to subshining, 1–2 pairs scutellars; wing relatively narrow; subcostal cell longer than wide; vein r–m nearly always apicad of middle of discal cell; posterior extension of basal cubital cell not much longer than its width at base; abdominal tergum, at least posteriormost, shining, usually black but sometimes mixed with other colors.

Discussion.—This highly artificial group represents an assemblage of several different kinds of genera having few recognizable morphological relationships at the tribal level. It comprises a group of close relatives, which has defied the classification efforts of a number of prominent tephritid authorities. As an example, these genera appear as the subfamily Aciurinae in the work of Hering (*1947b*) and others, as part of the Tephritinae in that of Aczél (*1953b*), and as a tribe of the Trypetinae in that of Hardy (*1973*, *1974*). Munro (*1947*), even after conducting a careful study on the basis of measurable morphological characters, was unable to associate the "aciuroid" genera satisfactorily with other major supergeneric groups. The discovery of unstudied morphological characters, or the application of biosystematic studies, will be required to break this apparent impasse. Munro (in litt.) reported that the aciuroid genera infest only three plant families in South Africa, but a wider variety of plants is used by these flies in other zoogeographic regions.

KEY TO GENERA OF "ACIURINI"

1. Frons wider than long; upper fronto-orbital bristles set well mesad of lower fronto-orbitals, anterior upper fronto-orbital anterior to posterior lower fronto-orbital; dorsocentral bristles in or close to transverse line through supra-alar bristles; 3d antennal segment drawn to very sharp point dorsoapically (fig. 16) ---------- ***Xenochaeta*** Snow

   Frons at most as wide as long, usually narrower; anterior upper fronto-orbital bristle distinctly posterior to line through posterior pair of lower fronto-orbitals; dorsocentral bristles distinctly anterior to transverse line through supra-alar bristles; 3d antennal segment usually rounded, but if pointed, rarely sharply so ---------- 2

2. Wing disk essentially dark; cell R3 completely dark from base to vein dm–cu except tips of 2 inverted hyaline triangles in cell R1 distad of subcostal cell -- 3

   Wing disk various, but not mostly dark; cell R3 with various hyaline marks ---- 5

3. One pair upper fronto-orbital bristles; veins r–m and dm–cu closer together along vein M than length of vein r–m, these 2 veins lying at distinct angle to one another; head and body covered with heavy white hairs contrasting boldly with dark integument ---------- ***Polymorphomyia*** Snow

   One to 2 pairs upper fronto-orbital bristles; veins r–m and dm–cu removed from each other along vein M by more than length of vein r–m, almost parallel to each other; head and body hairs slender, delicate, not contrasting markedly with integument ---------- 4

4. Abdominal terga brown without other lighter or darker marks; vein r–m near middle of discal cell; dorsocentral bristle situated between suture and transverse line through supra-alars ---------- ***Pseudopolionota*** Lima

Abdominal terga black, or black with yellow markings; vein r–m distinctly apicad of middle of discal cell; dorsocentral bristle very close to suture (fig. 119) ---------- ***Xanthaciura*** Hendel

5. Apical half of cell R5 broadly hyaline without any dark transverse band; subcostal cell bicolored (fig. 105) ---------- ***Rhithrum*** Hendel

Apical half of wing mostly dark, or with transverse or oblique dark and/or hyaline bands; subcostal cell usually entirely dark ---------- 6

6. Hyaline marks in cell R1 immediately distad of subcostal cell about same size ---------- 7

One of hyaline marks distad of subcostal cell markedly longer than other; disk hyaline with transverse or oblique dark bands ---------- 8

7. Two pairs lower fronto-orbital bristles; 2 pairs dark anepisternal bristles; vein R4+5 at most gently curved apicad of vein r–m (fig. 51) ---- ***Chrysaciura*** Aczél

Three pairs lower fronto-orbital bristles; 1 pair dark anepisternal bristles; vein R4+5 bowed sharply anteriorly apicad of vein r–m ---------- ***Lilloaciura*** Aczél

8. One pair scutellar bristles; 2 pairs lower fronto-orbital bristles; dorsocentral bristles situated very close to suture ---------- ***Pseudoedaspis*** Hendel

Two pairs scutellar bristles; 3 pairs lower fronto-orbital bristles; dorsocentral bristles somewhat removed from suture ---------- ***Aciurina*** Curran

DESCRIPTIONS OF GENERA

Genus *Acinia* Robineau-Desvoidy

(Fig. 34)

Acinia Robineau-Desvoidy 1830: 775. Type-species, *jaceae* Robineau-Desvoidy (Rondani 1871: 4) = *corniculata* (Zetterstedt).—Benjamin 1934: 46 (discussion neotrop. species).—Hendel 1935: 53 (comment on type-species).—Hering 1941a: 124 (in key, Peruvian gen.).—Aczél 1949a: 271 (in neotrop. cat.).—Aczél 1958: 75 (rev.).—Foote 1967: 57.4 (in neotrop. cat.).

Baryplegma Wulp of Cole 1923: 473 (desc. of *maculipennis*, n. sp.) [=*picturata* (Snow)].

Trypanea (*Tephritis*) Group I of Malloch 1933: 276.

Diagnosis.—In profile, frons meeting face at angle of about 130°; frons haired; 3 or more pairs lower fronto-orbitals; posterior notopleural light colored; katepisternal and anepimeral light colored; 2 pairs scutellars, posterior pair longer than 0.5 times anterior; row of outstanding setae only on tibiae of hind leg; wing with scattered hyaline spots, each bordered with brown darker than general infuscation of disk; subcostal cell brown with light areas; vein R4+5 bare or haired only at base; bulla absent.

Discussion.—The New World species of this genus can be readily recognized by the wing pattern—all species exhibit reticulation in which each rounded discal hyaline spot is narrowly bordered by a shade of brown darker than the general background, and in most species a row of hyaline spots progresses through the subapical parts of cells R3, R5, and M, leaving the apices of these cells almost entirely dark (fig. 34).

The genus has about 10 species, one of which is widespread in the United States, northern Mexico, and the West Indies. It occurs widely throughout the New World and is commonly found in collections.

The genus *Baryplegma* Wulp is difficult to distinguish from *Acinia* and as a result of further studies may prove to be congeneric. The type-species, *gilva* Wulp, possesses characters that are not entirely characteristic of the congeners of *corniculata*.

Genus *Aciurina* Curran

(Fig. 35)

Aciurina Curran 1932: 9. Type-species, *trixa* Curran (orig. desig.).—Curran 1934b: 293 (in key to Amer. gen.).—Foote 1967: 57.5 (in neotrop. cat.).

Tephrella Bezzi of Aczél 1953a: 193 (rev.).

Tephrella, authors.

Aciura, authors (part).

Diagnosis.—In lateral view, frons and face meeting at obtuse angle; frons haired; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, posterior one light colored or whitish; row of postoculars comprising expanded,

light-colored hairs, sometimes mixed with shorter, more slender dark ones; 1 pair dorsocentrals, between suture and transverse line through supra-alars; 2 pairs notopleurals, both dark; 1 pair scutellars; wing disk generally dark with hyaline incisions and spots, often with small rounded ill-defined clouds of lighter brown, or hyaline with dark marks; veins R2+3 and R4+5 somewhat sinuate, latter bare or haired at base; bulla present in most species.

Discussion.—This principally North American genus is known south of the United States only by the single species *mexicana*, which Aczél (*1953a*) described as a *Tephrella* from Mexico. I have seen a male from "Oajaca," Mexico, that appears to represent an undescribed species. It is in extremely poor condition with many of the head, body, and leg bristles missing.

Eleven described species (and possibly others) of this strictly New World genus are restricted to the Western United States. Bates (*1935*) presented a key to all the species known at that time (as *Tephrella*), and Aczél described, illustrated, and discussed *mexicana* in considerable detail.

Genus *Acrotaenia* Loew

(Fig. 36)

Acrotaenia Loew 1873: 274. Type-species, *Trypeta testudinea* Loew (orig. desig.).—Wulp 1899: 414 (desc.).—Hendel 1914b: 94 (in key to world gen.).—Hendel 1914c: 58 (desc., rev.).—Bates 1934: 8 (taxon. notes).—Curran 1934b: 291 (in key, Amer. gen.).—Aczél 1949a: 268 (in neotrop. cat.).—Foote 1967: 57.5 (in neotrop. cat.).

Diagnosis.—Frons haired or bare; 3–4 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, concolorous; setae in postocular row mixed black and light colored; facial carina absent; 1 pair dorsocentrals, situated very slightly behind suture; both pairs notopleurals light colored; 2 pairs scutellars, equal in length; vein r–m apicad of middle of discal cell; vein R2+3 sinuate; posterior extension of basal cubital cell very short; bulla absent; basal half of wing dark with numerous hyaline spots, apical half with transverse brown bands; 3–5 bullae immediately posterior to costa in cells 2d C, R1, and R2+3.

Discussion.—Species of *Acrotaenia* occur in Florida and south of Texas through Central America, the West Indies, northern South America, and Brazil. Prior to this study, *Caenoriata* Foote and *Neotaracia* Foote were included in *Acrotaenia* (see discussions of those genera). As restricted by the descriptions of those genera (Foote, *1978*), the genus contains only those species with wings having oblique apical bands and basal reticulation. No key to the described species has been published.

Genus *Acrotaeniacantha* Hering

(Fig. 37)

Acrotaeniacantha Hering 1939: 188. Type-species, *radiosa* Hering (orig. desig.).—Aczél 1949a: 259 (in neotrop. cat.).—Foote 1967: 57.6 (in neotrop. cat.).

Diagnosis.—Frons haired; facial carina absent; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, both light colored, anterior pair anterior to and mesad of posterior pair of lowers; 2 pairs scutellars, posterior pair longer than 0.5 times anterior; wing disk dark in basal ⅔ with numerous small hyaline spots, apical third with prominent stellate mark; vein r–m apicad of middle of discal cell; posterior extension of basal cubital cell rather long; vein R4+5 haired ventrally; bulla present.

Discussion.—This genus resembles *Acrotaenia* Loew in head and body characters, but the wing pattern is different. *A. radiosa* is the only broad-winged New World tephritid I have seen with a dark second costal cell filled with numerous small yellowish or hyaline spots. The characters given in the diagnoses and the key will enable one to distinguish the two genera easily. The genus was originally described from Venezuela, and all specimens I have seen belong to *radiosa* from that country—there are no other described species.

Genus *Anastrepha* Schiner

(Figs. 1–6, 38)

Anastrepha Schiner 1868: 263. Type-species, *Dacus serpentinus* Wiedemann (orig. desig.).—Wulp 1899: 404 (discussion, 2 Mex. species).—Hendel 1914a: 66 (key, known species); 84 (in key, world gen.).—Hendel 1914c: 11 (in key, So. Amer. gen.).—Curran 1931: 14 (in key, Puerto Rican and Virgin Isl. gen.).—Curran 1934b: 287 (in key, Amer. gen.).—Curran 1934a: 432 (species, Brit. Guiana).—Lima 1934a: 487 (rev.).—Greene 1934: 127 (rev.).—Hering 1941a: 123 (in key, Peruvian gen.); 136 (key, Peruvian species).—Stone 1942: 11 (rev.).—Baker et al. 1944: 1 (biol., Mex. species).—Aczél 1949a: 198 (in neotrop. cat.).—Yepez 1953: 1 (review, Venezuelan species).—Aczél 1954a: 71 (in key, "Anastrepha group").—Bush 1962: 87 (cytotaxon., larvae).—Foote 1967: 57.6 (in neotrop. cat.).—Steyskal 1977a: 75 (synonymy).—Steyskal 1977b: 1 (pictorial key, all known species).

Acrotoxa Loew 1873: 227. Type-species, *Dacus fraterculus* Wiedemann (Bezzi 1909).

Trypeta (*Acrotoxa*) Loew: Osten Sacken 1878: 189.

Anastrepha, subg. *Pseudodacus* Hendel 1914b: 97. Type-species, *daciformis* Bezzi (orig. desig.).—Hendel 1914c: 66 (key, known species).—Stone 1939a: 282 (rev.).—Stone 1942: 10 (taxon. note).—Aczél 1949a: 236 (in neotrop. cat.).—Foote 1967: 57.38 (in neotrop. cat.).—Steyskal 1977a: 75 (synonymy).—Steyskal 1977b: 1 (key, known species).

Phobema Aldrich 1925: 7. Type-species, *atrox* Aldrich (orig. desig.).—Aczél 1949a: 238 (in neotrop. cat.).—Foote 1967: 57.35 (in neotrop. cat.).—Steyskal 1977a: 75 (synonymy).—Steyskal 1977b: 1 (key, known species).

Lucumaphila Stone 1939b: 340. Type-species, *sagittata* Stone (orig. desig.).—Stone 1942: 10 (taxon. note).—Aczél 1949a: 233 (in neotrop. cat.).—Foote 1967: 57.30 (in neotrop. cat.).—Steyskal 1977a: 75 (synonymy).—Steyskal 1977b: 1 (key, known species).

Diagnosis.—Large, yellow-bodied flies with few dark markings; frons swollen in lateral view, distinctly haired; 3–4 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars well developed; facial carina present; antenna usually no longer than face, 3d segment rounded apically, arista bare; dorsocentrals situated in or very close to transverse line through posterior alars; 2 pairs scutellars; wing typically with brown S-shaped and a V-shaped band; crossvein r-m typically apicad of middle of discal cell; vein R5 bare, curving anteriorly at apex.

Discussion.—The genus *Anastrepha* infests a wide range of host fruits, and the species are recognized, along with the Mediterranean fruit fly and those of *Rhagoletis*, as the most economically important fruit flies in the New World. The genus extends virtually uninterrupted from southern Texas and Florida into every country to the south. (The absence of records from French Guiana reflects only insufficient collecting or our lack of complete knowledge about the literature concerning the genus.)

The synonymy presented here reflects only the most important taxonomic references. A large body of literature concerning distribution, hosts, economic factors, biological information, and control is currently being cataloged.

With Steyskal's (*1977a*) placing of *Lucumaphila*, *Phobema*, and *Pseudodacus* in synonymy with *Anastrepha*, the recognition of the last named genus is considerably facilitated. All the species can now be recognized simply by the apex of vein M, which is turned anteriorly to merge with the costa without any visible angle (figs. 6, 38). Stone's revision (*1942*) is the standard reference to the species known at that time, presenting a key to the species of *Anastrepha* (strict sense), describing and illustrating each, and summarizing distribution and host data. Steyskal's (*1977b*) excellent pictorial key makes possible the accurate identification of the 155 species known to date.

Genus *Anomoia* Walker

(Fig. 39)

Anomoia Walker 1836: 80. Type-species, *Trypeta gaedii* Meigen (monotypy) = *permunda* (Harris).

Neanomoea Hendel 1914b: 84. Type-species, *approximata* Hendel (orig. desig.).—Hendel 1931: 41 (nomencl. note).—Aczél 1949a: 298 (in neotrop. cat.).—Aczél 1954a: 72 (in key to gen., Group 1 Trypetini).

Hamouchaeta Blanchard 1929: 458. Type-species, *oglobini* Blanchard (monotypy).—Hendel 1931: 41 (nomencl. note).—Foote 1967: 57.25 (in neotrop. cat.).

Diagnosis.—Frons swollen in profile, haired; 3 pairs lower fronto-orbitals; 3 pairs upper fronto-orbitals; ocellars short; no facial carina

present; antenna shorter than face, 3d segment rounded apically, arista haired; dorsocentrals between transverse lines between supra-alars and postalars; acrostichals present; 2 pairs scutellars; wing largely dark basally and with narrow brown apical arc; vein r–m distinctly apicad of middle of discal cell; vein R4+5 haired.

Discussion.—The synonymy given here is that of Hardy (*1973*), who also includes *Phagocarpus* Rondani, which is also abundantly represented in the Oriental and Pacific Regions. Although South American specimens do not appear to possess a strongly oblique vein dm–cu as described by Hardy, they correspond well in all other characters, especially the distinctive wing pattern. This genus is represented in South America only by *ogloblini* Blanchard from Argentina, not seen in this study, and by an undescribed species from Brazil, which may eventually prove to be conspecific with *Acidia brasiliensis* Lima.

Anomoia, as pointed out by Hardy, is closely related in many respects to *Myoleja*; that discussion should be consulted for further details.

Genus *Baryplegma* Wulp

Baryplegma Wulp 1899: 416. Type-species, *gilva* Wulp (monotypy).—Hendel 1914b: 95 (in key, world gen.).—Hendel 1914c: 8 (in key, So. Amer. gen.); 62 (cat., discussion).—Aczél 1949a: 274 (in neotrop. cat.).—Foote 1965b: 243 (desc., type-species).—Foote, 1967: 57.17 (in neotrop. cat.).
Baryphlegma, authors.

Diagnosis.—Head higher than long; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, anteriormost centrad of posterior upper fronto-orbital and about even with it; antenna shorter than face, 3d segment rounded apically, arista bare; 1 pair dorsocentrals very close to suture; 2 pairs scutellars; wing pattern *Acinia*-like with light brown background and with darker brown surrounding each hyaline spot; cell R5 with large light spot at apex, vein r–m apicad of middle of discal cell; vein R4+5 haired.

Discussion.—The characters in the diagnosis and key will allow separation of this genus from *Acinia*. I have seen the holotype of *gilva*, known only from Mexico, in the British Museum (Natural History) (Foote *1965b*), but that specimen now needs further study in the light of taxonomic characters being used here. A second species, described by Enderlain from Costa Rica, may be congeneric.

Genus *Blepharoneura* Loew

(Figs. 11, 17, 40)

Blepharoneura Loew 1873: 272. Type-species, *Trypeta poecilogastra* Loew (orig. desig.) = *poecilosoma* (Schiner).—Wulp 1899: 411 (species described, keyed).—Hendel 1914b: 82 (in key, world gen.).—Hendel 1914c: 20 (rev.).—Bates 1933: 48 (desc.).—Curran 1934b: 287 (in key, Amer. gen.).—Hering 1941a: 123, 132 (in key, Peruvian gen., rev.).—Aczél 1949a: 195 (in neotrop. cat.).—Aczél 1953a: 104 (in key, genera of Acanthonevrini).—Foote 1967: 57.17 (in neotrop. cat.).

Diagnosis.—Frons swollen in profile, haired; central third to half of parafacial hidden behind anterior margin of eye; 2 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars well developed; facial carina absent; antenna shorter than face, 3d segment rounded apically, arista haired; dorsocentrals between transverse lines across supra-alars and postalars; 3 pairs scutellars; wing pattern reticulate, hyaline spots not distributed evenly on dark field; subcostal cell as long as greatest width, or slightly longer; vein r–m very close to middle of discal cell; vein R4+5 haired; vein CuA1 haired; posterior extension of basal cubital cell rather long.

Discussion.—This genus is easily recognized by a combination of characters, including a haired arista and vein CuA1 and the half-hidden parafacial (lateral view). The habitus of these flies resembles that of *Hexachaeta* Loew, but the wing pattern, although variable, is rather different in most species (cf. figs. 40 and 75). A dozen or so species of *Blepharoneura* are found from Mexico south to Brazil, and individuals are commonly seen in general collecting. Despite their abundance, however, the genus has never been taxonomically revised.

Genus *Caenoriata* Foote

(Fig. 41)

Caenoriata Foote 1978: 31. Type-species, *Acrotaenia pertinax* Bates (orig. desig.).

Diagnosis.—Frons bare; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, concolorous; facial carina present; all setae in postocular row light colored; 2 pairs dorsocentrals, 1 anterior to suture; notopleural bristles unicolorous; 2 pairs scutellars, posterior pair longer than 0.5 times anterior; vein r–m apicad of middle of discal cell; vein R2+3 sinuate; posterior extension of basal cubital cell rather long; bulla absent; wing almost entirely dark from base to middle of cell R4+5, from which point narrow dark rays proceed to anterior, apical, and posterior margins of wing.

Discussion.—*Caenoriata pertinax* (Bates) is a distinctive species (see key) different in many important respects from those that are typically congeneric with *testudinea* (Loew), the type-species of *Acrotaenia*. *Caenoriata* is so far known only from Brazil.

Genus *Cecidocharella* Hendel

(Fig. 42)

Cecidocharella Hendel 1936: 74. Type-species, *elegans* Hendel (monotypy).—Aczél 1949a: 189 (in neotrop. cat.).—Aczél 1953a: 109 (in key, genera of Oedaspdinae); 114 (rev.).—Foote 1967: 57.18 (in neotrop. cat.).—Bush and Huettel 1970: 88 (rev.).

Diagnosis.—Frons haired; eye almost 2 times as high as wide in profile; face matte, facial carina present; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, posterior one light colored; postocular row with both light-colored and dark setae; 1 pair dorsocentrals very close to suture; notopleurals unicolorously dark; 2 pairs anepisternals; wing hyaline with dark transverse bands; subcostal cell longer than greatest width; vein r–m at or very close to middle of discal cell; veins R2+3 and R4+5 sinuate, latter bare; posterior extension of basal cubital cell short; bulla present; abdominal tergum subshining.

Discussion.—Previously known only from Texas, Argentina, Paraguay, and Brazil, this genus will probably be shown to exist throughout most of the Neotropical Region. I have seen a specimen in poor condition from Mexico, probably *borrichia* Bush and Huettel. Bush and Huettel (*1970*) reviewed the genus and keyed the three known species. They stated that its affinities lie most closely with the genera *Ostracocoelia* Giglio-Tos, *Neorhagoletis* Hendel, and *Dracontomyia* Becker.

Genus *Cecidochares* Bezzi

(Fig. 43)

Cecidochares Bezzi 1910: 20. Type-species, *Trypeta nigerrima* Loew (Hendel 1914c: 40) = *connexa* (Macquart).—Hendel 1914b: 87 (in key, world gen.).—Hendel 1914c: 40 (taxon. discussion).—Lima 1934b: 120 (taxon. discussion).—Aczél 1949a: 186 (in neotrop. cat.).—Aczél 1953a: 110, 126 (rev.).—Foote 1967: 57.19 (in neotrop. cat.).

Cecidochares subg. *Eucecidochares* Bezzi and Tavares 1916: 157, 159. Type-species, *Urophora connexa* Macquart (orig. desig.).

Costalimaia Hering 1947a: 4. Type-species, *Procecidochares fluminensis* Lima (orig. desig.).

Diagnosis.—Frons bare; face matte; facial carina absent; 3 pairs lower fronto-orbitals, 2 pairs upper fronto-orbitals, both dark; all postoculars dark, slender, sharply pointed; scutum shining, covered by expanded white setae in irregular rows; 2 pairs dorsocentrals, 1 presutural; both notopleurals dark; 2 pairs anepisternals; wing hyaline with fairly wide, dark, diagonal bands; subcostal cell longer than wide; vein r–m about its own length distant from vein dm–cu; veins R2+3 and R4+5 straight or nearly so, latter haired dorsally; bulla absent.

Discussion.—Eleven described species of *Cecidochares* are known in South America from Ecuador and Venezuela to Argentina and Brazil. The entire genus is neotropical. In this study I have seen specimens from Central America and Mexico that are yet to be identified. The wings of all but one of the known species are similar in having a hyaline fascia extending completely across the wing from the second costal through the anal cells and three or four dark, oblique bands apicad of

that fascia. Although distinctive, the genus is similar to *Procecidochares* Hendel and *Procecidocharoides* Foote.

Genus *Celidosphenella* Hendel

(Figs. 44–47)

Celidosphenella Hendel 1914b: 86 (1914c: 48). Type-species, *maculata* Hendel (orig. desig.).—Aczél 1949a: 258 (in neotrop. cat.).—Aczél 1953a: 148 (in key, genera of Group I Tephritinae).—Aczél 1953b: 273 (rev., *diespasmena* group).—Foote 1967: 57.20 (in neotrop. cat.).—Hardy 1968: 137 (*poecila*).

Trypanea (*Trypanea*) Group VII (part), Malloch 1933: 292 (keys, discusses 3 species, Chile, Patagonia).

Melanotrypana Hering 1944a: 14. Type-species, *Acanthiophilus benoisti* Seguy (orig. design.). NEW SYNONYMY.

Diagnosis.—In profile, face and frons meeting at distinct angle of about 90°; frons bare; 3 or more pairs lower fronto-orbitals; 1 pair scutellars; wing pattern resembling that of *Tephritis* but with a subrectangular hyaline area immediately beyond subapical cell, which descends into cell R4+5; subcostal cell entirely dark with dark area immediately posterior to it; vein R4+5 bare or haired; bulla absent.

Discussion.—As indicated in my catalog (Foote *1967*), *Celidosphenella* (and the synonyms discussed here) comprises six described species that have been recorded only from Ecuador, Chile, and Argentina. A rather large number of tephritines with three pairs of lower fronto-orbitals and one pair of scutellars appear to be congeneric with *C. maculata* Hendel, and additional ones exit to that genus in the key more because they definitely do not belong to *Lamproxyna* Hendel or to *Trupanea* Schrank.

Thus the genus as it stands will tend to become a 'dumping ground' unless revisionary work is undertaken to establish the true congeners of *maculata*. No guide to the identification of species is available.

The wing pattern of species fitting my concept of the genus has a dark subcostal cell with a more or less solid dark area posterior to it, as in *Tephritis*; a rectangular hyaline area, sometimes broken by much smaller dark marks, extending along cell R1 apicad of the subcostal cell (figs. 44–47); and often incomplete dark rays to the apical margin of the disk (fig. 44). Sexual dimorphism in the wing pattern is common (compare figs. 44 and 45, 46 and 47); the differences between the sexes are rather pronounced in some cases.

Genus *Ceratitis* Macleay

(Figs. 15, 18, 48)

Ceratitis Macleay 1829: 482. Type-species, *citriperda* Macleay (monotypy) = *capitata* (Wiedemann).—Hendel 1914b: 76 (in key, world gen.).—Hendel 1914c: 10 (in key, So. Amer. gen.).—Curran 1934b: 287 (in key, Amer. gen.).—Aczél 1949a: 190 (in neotrop. cat.).—Foote 1967: 57.20 (in neotrop. cat.).

Diagnosis.—In profile, frons and face meeting at curve rather than at angle, both matte; frons haired; 2 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, posterior pair comparatively short and slender, anterior pair (in males of *capitata*) enlarged and broadly capitate; ocellars well developed; face without carina; antenna shorter than face, 3d segment rounded apically, arista visibly haired; 1 pair dorsocentrals, in transverse line through anterior supra-alars; scutellum rather swollen; 2 pairs scutellars, about equal in length; wing moderately broad, disk hyaline with light brown transverse or oblique bands and small, dark, irregularly shaped spots at base; vein r–m near middle of discal cell; vein R4+5 bare; posterior extension of basal cubital cell long and somewhat swollen near its middle; bulla absent.

Discussion.—As far as is known, *capitata* (Wiedemann), the Mediterranean fruit fly, is the only species of *Ceratitis* or its related genera known to have occurred in this study area. The characters used and the information presented in this bulletin refer only to that species. It ranks with certain species of *Anastrepha* and *Rhagoletis* as one of the most economically important species of Tephritidae in the New World. In many parts of Central and South America, it does not cause appreciable damage to agriculture because it can exist in

many wild fruits. However, its recent appearance in southern Mexico has caused much concern among those engaged in protecting U.S. agriculture as it has on several occasions when introduced into California, Texas, and Florida. Two excellent articles (Anonymous *1975*, Rhode *1976*) summarize the history and significance of the Mediterranean fruit fly in the United States, Mexico, and Central America.

C. capitata is known to exist more or less permanently in almost all the South American countries. During this study I have seen specimens from Colombia, Surinam, and Ecuador; these three countries, along with Guyana and French Guiana, have never reported its presence.

Both sexes of the Mediterranean fruit fly are easily recognized by the characters given in the key and diagnosis.

Genus *Ceratodacus* Hendel

(Figs. 19, 49)

Ceratodacus Hendel 1914b: 81 (1914c: 10). Type-species, *longicornis* Hendel (orig. desig.).—Hering 1941a: 123 (in key, Peruvian gen.).—Aczél 1949a: 192 (in neotrop. cat.).—Aczél 1953a: 104 (in key to genera of Acanthoneurini).—Foote 1967: 57.20 (in neotrop. cat.).

Diagnosis.—In lateral view, face and frons meeting at about 90°; frons distinctly haired; face shining, spotted, with distinct carina; 2 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars well developed; antenna distinctly longer than face, 3d segment rounded apically, arista whitish, swollen along almost all its length; 1 pair dorsocentrals, very close to or in transverse line through postalars; scutellum rather rounded with indistinct cleft at apex; 3 pairs scutellars; vein r–m distinctly basad of middle of discal cell; vein R4+5 bare.

Discussion.—It is difficult to misidentify the type-species, known to date only from Peru, because of its very distinctive characteristics. Although I have not seen *longicornis*, a second, very similar species from Brazil has appeared during this study. It has a different wing pattern and may be undescribed.

Genus *Chetostoma* Rondani

(Figs. 20, 50)

Chetostoma Rondani 1856: 112. Type-species, *curvinerve* Rondani (orig. desig.).—Foote and Blanc 1963: 12 (rev., Calif.).—Foote 1965a: 677 (in No. Amer. cat.).
Chaetostoma, emendation.

Diagnosis.—In profile, face and frons meeting at angle of about 130°; frons rather narrow, haired; 3 pairs rather slender lower fronto-orbitals; 2 pairs upper fronto-orbitals, anterior pair strongly developed; ocellars well developed; face unspotted, facial carina absent; gena with several black bristles as long as, and anterior to, genal bristle; antenna shorter than face, 3d segment rounded apically, arista bare; 1 pair dorsocentrals, in transverse line through supra-alars; acrostichals present; 2 pairs scutellars, about equal in length; wing hyaline with narrow transverse brown bands; vein r–m distinctly apicad of middle of discal cell; vein R4+5 haired.

Discussion.—An unknown number of palaearctic species of *Chetostoma* complement the two known from the Western United States and Mexico, the latter by one specimen, as yet unidentified to species, as a result of this study. The species closely resemble those of nearctic *Trypeta* Meigen but have a slightly different wing pattern and a number of equally strong genal bristles.

Genus *Chrysaciura* Aczél

(Fig. 51)

Chrysaciura Aczél 1953a: 188. Type-species, *bipuncta* Aczél (orig. desig.).—Foote 1967: 57.21 (in neotrop. cat.).

Diagnosis.—In profile, frons and face meeting at angle of slightly more than 90°; frons bare; 2 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, posterior pair light colored; postoculars expanded, light colored; 1 pair dorsocentrals, very close to suture; posterior notopleurals light colored; 1 pair anepisternals; 1 pair scutellars; wing rather narrow; disk bicolored brown, narrow darker

band along costa to apex of cell R5, and short rounded hyaline incisions and discal spots; vein R2+3 with abrupt bend anteriorly to costa; vein R4+5 gently curved, bare; bulla absent.

Discussion.—Aczél (*1953a*) described, illustrated, and discussed *bipuncta* in considerable detail. The type-species, known only from Argentina, is the only known member of the genus. Paratypes in the U.S. National Museum, Washington, D.C., have been available for study.

Genus *Cryptodacus* Hendel

(Fig. 52)

Cryptodacus Hendel 1914b: 84 (1914c: 12). Type-species, *obliquus* Hendel (orig. desig.).—Aczél 1949a: 192 (in neotrop. cat.).—Aczél 1954a: 72 (in key to gen., Trypetini Group 1).—Foote 1967: 57.21 (in neotrop. cat.).

Diagnosis.—Three pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars well developed; antenna shorter than face, 3d segment rounded apically, arista bare; 1 pair dorsocentrals, in transverse line through postalars; acrostichals present; 2 pairs scutellars; wing hyaline with distinct transverse band at middle of disk; vein r–m apicad of middle of discal cell, lying at distinct angle to vein M.

Discussion.—The diagnosis given here and information in the discussion of the genus *Lezca* serve to distinguish this genus from its other close relatives, *Haywardina* and *Cryptoplagia*. Two species, one from Bolivia and one from Brazil, have previously been assigned to this American genus, but I have examined four specimens representing two distinct, apparently undescribed species, presumably from Colombia, which are certainly congeneric except for differences in wing patterns.

Genus *Cryptoplagia* Aczél

(Fig. 53)

Cryptoplagia Aczél 1951: 265. Type-species, *cuculiformis* Aczél (orig. desig.).—Foote 1967: 57.21 (in neotrop. cat.).

Diagnosis.—Frons somewhat swollen in lateral view, haired; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars well developed; facial carina present; antenna shorter than face, 3d segment pointed dorso-apically, arista bare; dorsocentrals in or very close to transverse line through supra-alars; 2 pairs scutellars; wing disk hyaline with brown transverse bands; vein r–m near middle of discal cell; vein R4+5 bare.

Discussion.—The holotype and allotype of *C. cuculiformis* Aczél are in the U.S. National Museum of Natural History, Washington, D.C. The genus is not likely to be confused easily with its close relatives *Lezca*, *Haywardina*, or *Cryptodacus*. Known previously only from Aczél's type-species from Peru, *Cryptoplagia* contains what appears to be a second but undescribed Peruvian species.

Genus *Cryptotreta* Blanc and Foote

(Fig. 54)

Cryptotreta Blanc and Foote 1961: 82. Type-species, *Eurosta pallida* Cole (orig. desig.).—Foote 1967: 57.21 (in neotrop. cat.).

Diagnosis.—In profile, face meeting frons at distinct angle of about 120°; frons matte, bare; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; face matte; parafacial spot present; 1 pair dorsocentrals, between suture and transverse line through supra-alars; 1–2 pairs anepisternals; 2 pairs scutellars, posterior pair longer than 0.5 times anterior pair; wing reticulate, often with distinct, large hyaline spot in basal posterior quarter of disk; vein R2+3 sinuate; vein R4+5 haired below only; posterior extension of basal cubital cell short to moderately long; bulla present but may be indistinct.

Discussion.—Only two species of *Cryptotreta*, *pallida* Cole from Baja California and *cislimitensis* Steyskal from San Ysidro, Calif., are known. The only new specimens seen in this study that are definitely assignable to this genus, also from Baja California, are probably *pallida*. The species generally resemble those of *Eutreta* Loew, but the differ-

ent wing pattern and other characters set them apart adequately for ready recognition. Specimens are rarely found in general collecting.

Genus *Dacus* Fabricius

(Fig. 55)

Dacus Fabricius 1805: 272. Type-species, *armatus* Fabricius (Hendel 1927: 24).

Diagnosis.—Brownish-yellow flies, body sometimes with black and/or bright yellow markings, wings usually with dark band along costa and often with other markings on wing disk; 2 pairs lower fronto-orbitals; 1 pair upper fronto-orbitals; ocellars, if present, very short, fine, hairlike; antenna at most little longer than face, arista bare; scutellum rather truncate, 1–2 pairs scutellars, situated posterior to middle of scutellum; basal M cell distinctly wider than basal cubital cell; vein R4+5 rather sinuate; cell R5 relatively wide.

Discussion.—This easily recognized genus is, or has been, found in all zoogeographic regions. In the Palaearctic Region it appears only in Egypt, the Near East, and along the union of the Palaearctic with the Oriental and Pacific Regions. The accidental introduction of two species represents the only occurrence of the genus in the New World. *D. dorsalis* Hendel has been found on several occasions in California followed by successful eradication campaigns. One specimen of *D. cucurbitae* Coquillett was trapped in Los Angeles County, Calif., in 1956, and several larvae were identified from material intercepted at quarantine, presumably originating in Acapulco, Mexico, in 1976. Both of these finds were followed up by intensive surveys without additional specimens being discovered. The genus is included here in the event that further introductions might be found. The information here centers on the characteristics of these two species, although it might well apply to several other species as well.

Viewed from a world standpoint, *Dacus* is probably the most economically important genus in the family; its species attack a very wide range of plants.

Genus *Dictyotrypeta* Hendel

(Fig. 56)

Dictyotrypeta Hendel 1914b: 93 (1914c: 49). Type-species, *syssema* Hendel (orig. desig.).—Hering 1941a: 124 (in key, Peruvian gen.); 148 (desc.).—Aczél 1949a: 259 (in neotrop. cat.).—Foote 1967: 57.21 (in neotrop. cat.).

Diagnosis.—Frons matte, haired; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals all dark, all light, or posterior pair light; face matte, sometimes spotted; 1 pair dorsocentrals, very close to suture; 2 pairs scutellars about equal in length; notum with bare patches devoid of setulae; wing relatively narrow; vein R2+3 sinuate; vein R4+5 straight, haired to level of vein dm–cu; basal cubital cell with very little extension; bulla present; abdominal tergum with long white setae.

Discussion.—The determination that the genus *Icterica* Loew does not occur south of the United States and that *Ictericodes* Hering, proposed to replace it for related neotropical species, is restricted to the Palaearctic Region, leaves *Dictyotrypeta* as the genus into which several species occurring from Mexico to Brazil may possibly be placed.

I have not seen a species that can definitely be identified with the type-species *syssema* Hendel, but several specimens representing two species are congeneric with *Dictyotrypeta* without any doubt. Additional material seen in this study indicates the possible existence of at least three closely related genera, if not congeneric. One of them has a yellowish head and body setae, the other a wing with the brown in two shades and a distinct bulla. Additional specimens are required for a deeper analysis.

This New World genus appears to be much more widespread (Mexico to Argentina and Brazil) than previously recognized.

Genus *Dioxyna* Frey

(Fig. 57)

Dioxyna Frey 1945: 62. Type-species, *Trypeta sororcula* Wiedemann (orig. desig.).—Foote 1967: 57.21 (in neotrop. cat.).—Novak 1974: 1 (rev., No. Amer.; some Mex. records).

Diagnosis.—In profile, face and frons meeting at rather distinct angle of more than 90°; head as long as high; parafacials relatively wide; frons bare; 2 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, posterior one light colored; antenna as long as face, 3d segment rounded apically; mouthparts distinctly geniculate; 1 pair dorsocentrals; notopleurals concolorously dark; 1 pair anepisternals; these, katepisternals, and anepimerals concolorously dark; 1 pair scutellars; no outstanding rows of setae on middle or hind legs; wing reticulate, subcostal cell commonly entirely dark without rounded light spot; vein r–m apicad of middle of discal cell; vein R4+5 bare; bulla absent.

Discussion.—This genus, widespread in the New World, is represented by five described species and several undescribed ones found during this study from numerous localities. Although Munro (*1957*) discussed this genus in detail and its relationships with *Paroxyna* Hendel in the Afrotropical Region, a thorough, detailed study of the two genera in the New World is required. Externally the species are very similar and therefore will probably require at least the examination of male and female postabdomens to reveal useful distinguishing characters. Species of *Dioxyna* always have only one pair of scutellars and usually a slightly longer head than those of *Paroxyna*, although that character is often difficult to use as a distinguishing one. Novak (*1974*) keyed and discussed the U.S. species, but no guide to those south of the United States is available.

Genus *Dracontomyia* Becker

(Fig. 58)

Dracontomyia Becker 1919: 193. Type-species, *riveti* Becker (monotypy).—Aczél 1949a: 312 (in neotrop. cat.).—Aczél 1953a: 109, 120 (rev.).—Foote 1967: 57.22 (in neotrop. cat.).

Diagnosis.—Frons haired; facial carina absent; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, posterior pair light colored; postoculars slender, sharply pointed; 1 pair dorsocentrals between suture and transverse line between supra-alars; posterior pair of notopleurals light colored; 1 pair anepisternals; wing hyaline with prominent dark transverse bands; vein r–m at or very close to middle of discal cell; veins R2+3 and R4+5 distinctly sinuate, latter bare; anal cell with very short posterior extension; bulla present.

Discussion.—This distinctive genus, known only by two species, one from Ecuador and one from Peru, is easily recognized by its unusual wing with its wide cell R1, sinuate veins R2+3 and R4+5, and distinctive pattern. No other genus appears to be closely related morphologically. The species may be identified by consulting Aczél's revision (*1953a*).

Genus *Dyseuaresta* Hendel

(Figs. 59–62)

Dyseuaresta Hendel 1928: 368. Type-species, *adelphica* Hendel (orig. desig.).—Curran 1931: 14 (in key to gen., Puerto Rico and Virgin Isl.).—Curran 1934b: 293 (in key, Amer. gen.).—Bates 1934: 15 (taxon. comment).—Benjamin 1934: 51 (diagnosis, discussion).—Hering 1941a: 125 (in key, Peruvian gen.); 156 (desc.).—Aczél 1949a: 279 (in neotrop. cat.).—Foote 1967: 57.22 (in neotrop. cat.).

Diagnosis.—In profile, face meeting frons at distinct angle of about 90°; frons haired; 2 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, posterior pair light colored; at least 1 species with parafacial spot at level of antennal base; notopleurals, katepisternals, and anepimerals light colored; 1 pair scutellars; wing predominantly brown, sometimes bicolored, with numerous hyaline incisions and rounded discal spots; stigma entirely dark; vein R4+5 haired in most species, occasionally to level of vein r–m, and sometimes ventrally as well; bulla present.

Discussion.—This entirely New World genus is represented by only one species in the United States. This study indicates that there are probably several undescribed species from Mexico south, but the limits of the genus are not well known. For instance, the genus runs in two places in the key owing to my assignment of a broad-winged species with a very dark disk and the head having a para-

facial spot at the level of the antennal bases. Another species, rather unlike *mexicana* (Wiedemann), is *Trupanea caracasana* Fernandez, which differs also from most *Dyseuaresta* species in that the wing disk resembles that of *Acinia* in comprising two shades of brown with many of the hyaline spots lying in the lighter shade and bordered by the darker brown. I also include a fourth species, *Dyseuaresta trinotata* Bates (fig. 59), which needs further study to determine its correct generic status.

Genus *Ensina* Robineau-Desvoidy

(Fig. 21)

Ensina Robineau-Desvoidy 1830: 751. Type-species, *Musca sonchi* L. (monotypy).—Wulp 1899: 416 (discussion, new species).—Hendel 1914b: 96 (in key, world gen.).—Hendel 1914c: 65 (in key, neotrop. gen.).—Curran 1931: 14 (in key, Puerto Rican and Virgin Isl. gen.).—Malloch 1933: 272 (taxon. discussion).—Hering 1941a: 124 (rev.).—Aczél 1949a: 274 (in neotrop. cat.).—Steyskal 1970: 158 (general discussion).

Diagnosis.—In profile, face and frons meeting at distinct angle of about 120°; head about as long as high; frons bare; 3 pairs lower fronto-orbitals; 1 pair upper fronto-orbitals; mouthparts distinctly geniculate; notopleurals concolorously dark; anepisternal dark; katepisternal and anepimeral both light colored; 2 pairs scutellars, posterior pair at least half as long as anterior pair; neither middle nor hind leg with rows of outstanding setae; wing mainly hyaline with several small, ill-defined dark areas; subcostal cell dark with lighter areas; vein r–m apicad of middle of discal cell; vein R4+5 bare; bulla absent.

Discussion.—Steyskal (*1970*) discussed the history and status of the *Ensina-Protensina* question in detail and thoroughly reviewed the literature. He concluded that *Ensina* is represented in the New World only by the ubiquitous *E. sonchi* (L.), which apparently occurs from the West Indies south to Brazil. I have seen nothing during this study to contradict these findings, but a closer study of material that has recently come to hand is required.

Genus *Epochrinopsis* Hering

(Fig. 63)

Epochrinopsis Hering 1939: 168. Type-species, *bicolorata* Hering (orig. desig.).—Aczél 1949a: 252 (in neotrop. cat.).—Aczél 1951: 256 (in key, genera of Tryptetini).—Aczél 1954a: 74 (rev. of previous key, desc.).—Foote 1967: 57.23 (in neotrop. cat.).

Epochrinopsis, subgenus *Epochrella* Hering 1961: 2. Type-species, *rivellioides* Hering (orig. desig.).—Foote 1967: 57.23 (in neotrop. cat.).

Diagnosis.—In profile, frons *Euaresta*-like, swollen, broad, haired; facial carina absent; 3 or more pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals set well mesad of lowers; ocellars very long and heavy, about 1.5 times as long as longest lower fronto-orbital; antenna shorter than face, 3d segment rounded apically, arista bare; dorsocentrals situated at suture; acrostichals present; 2 pairs scutellars; wing with rather diffuse brown bands that are rather heavily reticulated with hyaline spots, such spots also evident in subhyaline areas between bands; vein r–m at or little beyond middle of discal cell; vein R4+5 haired.

Discussion.—Neither of Hering's type-species was found in this study. However, I have seen a single female from Quito, Ecuador, which is closely related to, but doubtfully conspecific with, *rivellioides* Hering. Hering's distinction between *Epochrella* and typical *Epochrinopsis* does not seem to justify the erection of a subgenus. A final decision is hereby reserved until the type-species can be examined. The genus has not undergone revision since its original description.

Genus *Euaresta* Loew

(Figs. 8, 22, 64–66)

Euaresta Loew 1873: 296. Type-species, *Trypeta festiva* Loew (Coquillett 1910: 540).—Wulp 1900: 423 (species, Mex.).—Coquillett 1910: 540 (type-desig.).—Hendel 1914b: 96 (in key, world gen.).—Hendel 1914c: 70 (in key, So. Amer. gen.).—Curran 1928: 70 (in key, Puerto Rican gen.).—Curran 1931: 14 (in key, Puerto Rican and Virgin Isl. gen.).—Benjamin 1934: 49 (desc., taxon. discussion).—Aczél 1949a: 281 (in neotrop. cat.).—Quisenberry 1950: 9 (rev., No. Amer.).—Aczél 1952d: 147 (rev.).—Foote 1967: 57.23 (in neotrop. cat.).—Steyskal 1972a: 130 (taxon. comment).

Camaromyia Hendel 1914b: 95 (1914c: 63). Type-species, *Trypeta bullans* Wiedemann (orig. desig.).—Malloch 1933: 273 (taxon. discussion, key to Chilean species).—Hering 1941a: 126 (in key, Peruvian gen.); 166 (desc.).—Aczél 1949a: 295 (in neotrop. cat.).—Aczél 1952a: 130 (in neotrop. cat. sup.).

Euaresta, subgenus *Setigeresta* Benjamin 1934: 50. Type-species, *Trypeta aequalis* Loew (orig. desig.).

Diagnosis.—In profile, frons and face meeting in curve or at very obtuse angle, frons noticeably swollen near lunule; frons haired; 2 pairs lower fronto-orbitals; 2 pairs scutellars, posterior pair longer than 0.5 times anterior pair; tibiae without rows of outstanding setae; fore femur of male distinctly enlarged; wing dark with discrete hyaline spots; subcostal cell usually with light mark; vein R4+5 haired; bulla present or absent.

Discussion.—I follow Aczél (*1952a*) in considering *Camaromyia* Hendel and *Setigeresta* Benjamin as synonyms of *Euaresta*. All three appear to be congeneric based on characters that are not the property of one sex alone. It is of interest to note that the enlarged fore femora and distinctive external genitalia of males are characters that appear elsewhere in the Tephritini (see discussion of *Plaumannimyia*, for instance), and I have also seen them in a badly damaged male belonging to an unknown genus of Trypetinae. During this study, I have also seen some specimens of *Euaresta* from South America that resemble *Euaresta bella* (Loew) of North America more closely than the widespread *bullans* (Wiedemann). Such species were not included in Aczél's revision (Aczél *1952a*) of *Euaresta*, which was confined to close relatives of *bullans*. Further study may show that my concept of *Euaresta* is actually a complex of discrete groups at the generic or subgeneric level in the New World.

Genus *Euarestoides* Benjamin

(Figs. 67, 68)

Trupanea, subgenus *Euarestoides* Benjamin 1934: 57. Type-species, *Trypeta abstersa* Loew (orig. desig.).—Hering 1941a: 125 (rev.).—Aczél 1949a: 292 (in neotrop. cat.).—Foote 1958: 288 (rev., No. Amer. species).—Foote 1967: 57.24 (in neotrop. cat.).

Diagnosis.—In profile, face and frons meeting at distinct angle of about 120°; frons haired; 3 pairs lower fronto-orbitals; posterior notopleural light colored; both katepisternal and anepimeral light colored; 2 pairs scutellars, posterior pair more than 0.5 times as long as anterior pair; hind tibia with row of delicate setae; wing reticulate, subcostal cell characteristic yellowish, shiny; vein R4+5 haired only at base; bulla absent.

Discussion.—Very closely related to *Neotephritis* Hendel, *Euarestoides* is easily recognized by the characteristic wing pattern and the presence in some species of extensive yellow areas basally. In the latter respect, some species resemble those of *Trypanaresta* Hering but can be distinguished by the presence, among other characters, of three pairs of lower fronto-orbitals. The North American species are very common in collections; they have been keyed by Foote (*1958*). The genus is widespread in the Neotropical Region, and further studies will probably show it to be ubiquitous.

Genus *Euarestopsis* Hering

Euarestopsis Hering 1937: 299. Type-species, *paupera* Hering (orig. desig.).—Aczél 1949a: 283 (in neotrop. cat.).—Foote 1967: 57.24 (in neotrop. cat.).

Diagnosis.—In lateral view, head *Euaresta*-like, with swollen frons; frons bare, with elevated ridge from ocellar triangle to lunule; 3 pairs lower fronto-orbitals, 2 pairs upper fronto-orbitals, both light colored; 2 pairs dorsocentrals, 1 presutural; 2 pairs notopleurals, posterior pair light colored; 1 pair dark anepisternals; 2 pairs scutellars, posterior pair longer than half length of anterior pair; wing disk broad, pattern as in *Tetreuaresta;* stigma with lighter marks; vein r–m distinctly apicad of middle of discal cell; vein R4+5 haired; bulla absent.

Discussion.—In his comments on the type-specimen of *paupera* (male, Costa Rica), Hering (*1937*) indicated that the frons above the lunule is "stark vorgeschwollen" and appears to be narrowed anteriorly. He further stated that if this condition is not due to shrinkage, the character might be considered to have generic value.

The frons of the only specimen examined in

this study, a female from São Paulo, Brazil, exhibits a similar condition. One's first impression certainly is of shrinkage, since the antennal bases and lunule are deeply sunken below the level of the frons, a condition that might possibly cause the ridge to appear along the length of the frons. However, because this character has appeared in both sexes and at such widely separated localities, I accept the condition as normal pending the examination of additional specimens.

Hering's illustration and description of *paupera* indicate that the female from Brazil is a different, very probably undescribed, species.

Genus *Eutreta* Loew

(Figs. 23, 69)

Icaria Schiner 1868: 276. Type-species, *Trypeta sparsa* Wiedemann (orig. desig.); preocc. Saussure 1853.

Eutreta Loew 1873: 276. Type-species, *Trypeta sparsa* Wiedemann (Coquillett 1910: 543).—Wulp 1899: 413 (2 species discussed).—Coquillett 1910: 543 (type desig.).—Hendel 1914b: 93 (in key, world gen.).—Hendel 1914c: 54 (in key, So. Amer. gen., desc.).—Lima 1934b: 126 (biol. notes).—Curran 1934b: 291 (in key, Amer. gen.).—Hering 1941a: 124 (in key, Peruvian gen.); 149 (desc.).—Aczél 1949a: 264 (in neotrop. cat.).—Foote 1967: 57.24 (in neotrop. cat.).—Stoltzfus 1977: 369 (rev., New World species).

Eutreta, subgenus *Phasmatocephala* Hering 1937: 297. Type-species, *rhinophora* Hering (orig. desig.).—Stoltzfus 1977: 374 (rev., New World species).

Diagnosis.—Frons matte, haired; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, posterior pair light colored; face matte, spotted or not; parafacial spot present; 1 pair dorsocentrals, between suture and transverse line through supra-alars; 2 pairs scutellars, about equal in length; wing rather broad, dark-brown disk with apical hyaline arc and numerous small hyaline and/or light-brown spots; vein R2+3 sinuate; vein R4+5 haired; bulla absent.

Discussion.—The genus *Eutreta* is restricted to the New World, where it occurs from Canada south to Brazil. It has been found commonly during this study, and it is often taken in general collecting in the Nearctic Region. All the North American species are distinctive in having a broad wing, the dark-brown field with numerous small light-brown or hyaline spots, and a narrow hyaline arc apically. In some neotropical species, however, only a partial apical hyaline arc is present, or it is represented by a hyaline spot that is not shaped like a sickle. Stoltzfus (*1977*) should be consulted for keys to the species of the New World.

I have seen a headless female from Minas Gerais, Brazil, in which the *Eutreta*-like wing is light at the base, a character uncommon to the known species.

Genus *Gerrhoceras* Hering

(Figs. 24, 70)

Gerrhoceras Hering 1941b: 474. Type-species, *paradoxa* Hering (orig. desig.).—Aczél 1949a: 252 (in neotrop. cat.).—Aczél 1954a: 73 (taxon., key, rev.).—Foote 1967: 57.25 (in neotrop. cat.).

Diagnosis.—In profile, face and frons meeting in curve rather than at angle; parafacial at least 0.5 times as wide as eye; lunule usually sunken below level of frons; frons haired; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; facial carina absent; antenna shorter than face, 3d segment pointed apically, arista bare; 1 pair dorsocentrals, in transverse line through supra-alars; acrostichals present; 2 pairs scutellars; wing rather narrow, hyaline with dark transverse and oblique bands and some reticulation in dark areas; vein r–m apicad of middle of discal cell; vein R4+5 bare; posterior extension of basal cubital cell rather long.

Discussion.—Previously known only from Bolivia and Peru, this unusual genus is also represented by specimens, as yet unidentified to species, from Mexico as a result of this study. Except for the wing pattern, the habitus of this genus closely resembles that of the North American genus *Eurosta* Loew in having a dark head and body covered in older specimens with what appears to be an oily substance that obscures the color and detail of the surface. The genus is distinctive as indicated in the diagnosis and key, and it has no close relatives in Mexico or South America.

Genus *Gonioxyna* Hendel

(Fig. 71)

Gonioxyna Hendel 1927: 160. Type-species, *magnipennis* Hendel (orig. desig.).—Zia 1937: 195 (taxon. discussion, desc.).—Zia and Chen 1938: 114 (taxon. discussion, desc.).

Diagnosis.—In profile, frons meeting face at distinct angle of about 135°; mouthparts geniculate; frons bare; 2 lower fronto-orbitals; both pairs notopleurals dark; katepisternal dark; anepimeral light colored; 2 pairs scutellars, posterior pair less than 0.5 times as long as anterior pair; few delicate outstanding setae on hind femur only; wing reticulate, costa bowed forward in region of subcostal cell, cell R1 in this region extremely wide; bulla present.

Discussion.—Prior to this study, *Gonioxyna* was known only from the eastern Palaearctic Region; at least four species have been described from Mongolia, China, and Japan. Foote and Blanc (*1979*) reviewed the three New World species, which range from Guatemala north to Wyoming. The genus is easily recognized by its geniculate mouthparts and the greatly expanded cell R1.

Genus *Goniurellia* Hendel

(Fig. 72)

Trypanea, subgenus *Goniurellia* Hendel 1927: 198. Type-species, *Trypeta augur* Frauenfeld (orig. desig.; misident.) = *tridens* Hendel (application to Commission pending; see below).—Munro 1957: 1043 (desc., taxon.).—Freidberg and Kugler 1977: 208 (nomencl., discussion of type-species).

Trypanea (*Tephritis*) Group II (part), Malloch 1933: 278 (discussion, desc. of species, Chile).

Diagnosis.—In profile, face and frons meeting at distinct angle of about 90°; frons haired; 2–3 pairs lower fronto-orbitals; posterior pair notopleurals light colored; katepisternals and anepimerals light colored; 1–2 pairs scutellars; wing *Trupanea*-like, with subcostal cell connected to apical stellate mark by broad dark band, hyaline wedge in cell R1 rarely crossing vein R2+3 into cell R3; vein R4+5 bare; bulla usually absent.

Discussion.—In describing this taxon as a subgenus of *Trypanea* [sic], Hendel (*1927*) apparently misidentified *Trypeta augur* Frauenfeld, the designated type-species, which, according to Freidberg and Kugler (*1977*) and Munro (*1957*) properly belongs to the African genus *Dectodesis* Munro in having long-geniculate mouthparts, a bare frons, and two pairs of scutellars. Freidberg and Kugler (*1977*) explained this situation in requesting the International Commission on Zoological Nomenclature to designate, as type of *Goniurellia*, the species *tridens* Hendel, with which the material in this study is more properly associated.

This palaearctic genus has not heretofore been recorded from the Neotropical Region. During the preparation of this publication, evidence has been presented to me by Amnon Freidberg (pers. commun.) that Old World *Goniurellia* species are not congeneric with the species included under this heading. However, from descriptions and wing patterns as figured in the literature, a number of species representing localities as widespread as Mexico, Ecuador, Chile, and Argentina outwardly resemble Old World species. A thorough study of males is required to establish generic limits on a world basis. I am aware of no characters that indicate any neotropical species are associated with *Dectodesis*. Specimens appear to be rather rare in collections.

Genus *Gymnocarena* Hering

(Figs. 25, 73)

Gymnocarena Hering 1940a: 4. Type-species, *Oedicarena diffusa* Snow (orig. desig.).—Foote 1960d: 112 (rev., No. Amer. species).

Oedicarena Snow (error), Curran 1934b: 289 (in key, Amer. gen.).

Tomoplagiodes Aczél 1954a: 91. Type-species, *mexicanus* Aczél (orig. desig.).—Foote 1967: 57.48 (in neotrop. cat.). NEW SYNONYMY.

Diagnosis.—Large yellow-bodied flies with few or no dark markings, all head and body bristles yellow; frons markedly swollen immediately posterior to lunule in lateral view (fig. 25); frons bare; 3–4 pairs lower fronto-

orbitals; 2 pairs upper fronto-orbitals; ocellars well developed; face receding in profile, with broad carina; antenna shorter than face, 3d segment rounded apically, arista bare; dorsocentrals about in transverse line through supra-alars; 2 pairs scutellars; tibia of hind leg with row of rather delicate posteroventral setae; wing hyaline, dark pattern broken, sometimes consisting only of apical patch of brown; vein r–m distinctly apicad of middle of discal cell; vein R4+5 haired dorsally and ventrally to level of vein dm–cu.

Discussion.—The genus *Gymnocarena* is rarely found in collections and is represented in the region under study here only by the species *mexicana* Aczél. It may be readily recognized by characters presented in the key, despite its great similarity to one or more species of *Oedicarena*. I am indebted to George C. Steyskal for suggesting the possibility that *Tomoplagiodes* Aczél is a synonym.

Genus *Haywardina* Aczél

(Fig. 74)

Haywardina Aczél 1951: 258. Type-species, *Tomoplagia cuculi* (orig. desig.).—Foote 1967: 57.25 (in neotrop. cat.).

Diagnosis.—In lateral view, frons and face meeting at angle of about 135°; frons haired; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars well developed; gena about 0.3 times eye height; facial carina present; antenna shorter than face, 3d segment pointed apically, arista bare; dorsocentrals in or close to transverse line through supra-alars; 2 pairs scutellars; wing hyaline with 2 narrow brown bands; vein r–m distinctly apicad of middle of discal cell; vein R4+5 bare.

Discussion.—The characters in this diagnosis serve to distinguish *Haywardina* from all closely related genera (see discussion of *Lezca* for further information on this genus). Known only from Argentina, the type-species is the only representative. The genus was not seen in this study.

Genus *Hetschkomyia* Hendel

Hetschkomyia Hendel 1914b: 86 (1914c: 33). Type-species, *maculipennis* Hendel (orig. desig.).—Hering 1941a: 123 (in key, Peruvian gen.).—Aczél 1949a: 241 (in neotrop. cat.).—Aczél 1951: 254 (in key, genera of Trypetini).—Aczél 1952a: 126 (in neotrop. cat.).—Foote 1967: 57.26 (in neotrop. cat. as *Hexachaeta*, error).

Brachytes Hendel 1914c: 33 and explanation of plates following p. 84 (preocc. Westwood 1842). Nomen nudum.

Diagnosis.—Two pairs lower fronto-orbitals; 1 pair upper fronto-orbitals; ocellars well developed; antenna shorter than face, 3d segment rounded apically, arista bare; acrostichals absent; scutellum somewhat swollen, rounded in lateral view; 2 pairs scutellars; wing hyaline with irregular patches of brown not in definite pattern; vein r–m apicad of middle of discal cell; vein R4+5 bare.

Discussion.—I have not seen any specimens assignable to this genus during this study. *Hetschkomyia* belongs in a group of genera including *Ischyropteron* Bigot and *Pseudophorellia* Lima, which lack acrostichals entirely. Characters in the key serve to distinguish these three genera. The genus is known only by its type-species, recorded to date only from Cuzco, Peru.

Genus *Hexachaeta* Loew

(Fig. 75)

Hexachaeta Loew 1873: 219. Type-species, *Trypeta eximia* Wiedemann (Coquillett 1910: 552).—Wulp 1899: 402 (key to, discussion of 6 species, Mex.).—Hendel 1914b: 82 (in key, world gen.).—Hendel 1914c: 23 (taxon. discussion, So. Amer. species).—Bates 1933: 50 (desc.).—Lima 1933: 382 (taxon.).—Curran 1934b: 287 (in key, Amer. gen.).—Lima 1935a: 235 (rev.).—Hering 1941a: 123 (in key, Peruvian gen.); 134 (rev.).—Aczél 1949a: 192 (in neotrop. cat.).—Aczél 1952a: 123 (in sup., neotrop. cat.).—Lima and Leite 1952: 297 (key to, desc. of, known species).—Aczél 1953a: 104 (in key, genera of Acanthonevrini).—Lima 1953c: 557 (rev., "Group 1").—Lima 1954: 281 (keys to species, "socialis" group).—Foote 1967: 57.26 (in neotrop. cat. as *Hetschkomyia*, error).

Neohexachaeta Lima 1953c: 566. Type-species, *guatemalensis* Lima (orig. desig.).—Foote 1967: 57.31 (in neotrop. cat.). NEW SYNONYMY.

Diagnosis.—In profile, frons definitely swollen, haired; facial carina absent; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars short and fine; antenna shorter than face, 3d segment rounded apically, arista haired; 1 pair dorsocentrals, between transverse lines through supra-alars and post-alars; acrostichals present; 3 pairs scutellars;

wing hyaline with distinctive dark transverse bands and usually 1 or 2 large hyaline triangles in cell R1 distad of subcostal cell; vein r–m at or close to middle of discal cell; vein R4+5 haired; femur of hind leg usually with cluster of dorsal preapical bristles.

Discussion.—Previous to this study, the 25 described species of *Hexachaeta* were known principally from Mexico, Central America, and northern South America. I have seen specimens from Guyana, Ecuador, Bolivia, and Argentina in addition to the previously recorded distribution. The genus is easily recognized by its wing pattern and other characters given in the key.

Loosely translated, Lima's (*1953c*) description of *Neohexachaeta guatemalensis* is short and lacks detail: "...the general characters of *Hexachaeta*, from which it is distinguished by the presence of 4 pairs of scutellar bristles...the single male is in too poor condition to permit a complete description...." The wing is typically *Hexachaeta* in pattern and venation, and as shown by Lima's figures, there is little to distinguish the postabdomen from that of *eximia* (Wiedemann). The holotype, said to be deposited in the U.S. National Museum, Washington, D.C., cannot be found.

Many specimens of *Hexachaeta* found in this study have an extra unpaired bristle on one side or the other of the scutellum. Since Lima apparently saw only one specimen and since there is a general tendency toward the presence of more than three pairs of scutellars, I consider *Neohexachaeta* and *Hexachaeta* congeneric.

Genus *Hexaresta* Hering

Hexaresta Hering 1941c: 18. Type-species, *juanita* Hering (orig. desig.).—Aczél 1949a: 191 (in neotrop. cat.).—Aczél 1953a: 104 (in key to genera of Acanthonevrini).—Foote 1967: 57.28 (in neotrop. cat.).

Diagnosis.—Two pairs lower fronto-orbitals; 1 pair upper fronto-orbitals; antenna shorter than face, 3d segment rounded apically, arista long haired, longest hairs longer than width of 3d antennal segment; 1 pair dorsocentrals, about halfway between lines through supraalars and postalars; 3 pairs scutellars; wing dark with hyaline incisions and discal spots, somewhat reminiscent of *Tetreuaresta* or *Xanthaciura;* vein r–m at or close to middle of discal cell; vein R4+5 bare.

Discussion.—Without doubt, Hering's description of this distinctive type-species places it in the Acanthonevrini. I have not yet seen this monotypic genus, known only from Surinam.

Genus *Homoeothrix* Hering

(Fig. 76)

Homoeothrix Hering 1944a: 7 (as *Homoeothrlx*, emended by Hering 1947a: 7). Type-species, *Euribia lindigi* Hendel (orig. desig.).—Aczél 1949a: 284 (in neotrop. cat.).—Foote 1967: 57.28 (in neotrop. cat.).

Diagnosis.—In lateral view, face and frons meeting at angle of about 120°; 3 pairs lower fronto-orbitals; both pairs upper fronto-orbitals dark; both pairs notopleurals dark; 2 pairs anepisternals, 1 pair katepisternals, 1 pair anepimerals, both pairs dark; 2 pairs scutellars, posterior pair more than 0.5 times as long as anterior pair; delicate setae in rows on femora and tibiae of midlegs and hind legs; wing dark with irregular reticulation; subcostal cell with light marks; vein R4+5 haired dorsally and ventrally; bulla absent.

Discussion.—This little-known genus from Colombia and Venezuela is known only by its type-species, *lindigi* (Hendel). Several specimens from Colombia seen in this study are closely related but have light-colored or white upper fronto-orbitals, and vein r–m is farther removed from vein dm–cu than its own length. These specimens probably represent an undescribed species, but their generic relationships bear further study.

Genus *Ictericodes* Hering

Ictericodes Hering 1942: 6. Type-species, *Trypeta japonica* Wiedemann (=*schneideri* (Lw.)).—Aczél 1952a: 120 (taxon. discussion).—Foote 1967: 57.28 (in neotrop. cat.).

Discussion.—The designation by Hering of *Trypeta japonica* Wiedemann as the type-species restricts *Ictericodes* to the Palaearctic

Region, and I have seen no neotropical specimens that can be considered congeneric. Hering's and Loew's descriptions and Loew's wing figure of *japonica* make rather difficult the distinguishing of *Ictericodes* from *Tephritis*, which is actually somewhat distantly related. The actual relationships of these two genera must await further studies.

All the New World species formerly assigned to *Ictericodes* by Aczél (*1950*, *1952a*) and Foote (*1967*) belong to other genera in this study.

Genus *Ischyropteron* Bigot

Ischyropteron Bigot 1889a: xxix. Type-species, *nigricaudatum* Bigot (monotypy).—Foote 1967: 57.29 (in neotrop. cat.).

Calopteromyia Bigot 1889b: xciii (unjustified new name for *Ischyropteron* Bigot). Type-species, *Ischyropteron nigricaudatum* Bigot (automatic).

Ischyropterum (error or emendation) Hendel 1914b: 93 (in key, world gen.).—Hendel 1914c: 49 (in key, So. Amer. gen.).—Aczél 1949a: 258 (in neotrop. cat.).

Diagnosis.—An unusual large yellowish fly with long, broad distinctively patterned wings and extremely slender legs; 1 pair dorsocentrals, halfway between transverse lines through anterior supra-alars and postalars; acrostichals absent; 2 pairs anepisternals; katepisternals absent; scutellum shining, flat sided, 2 pairs long, black scutellars; legs long, slender, without rows of setae, even on fore femur; wing hyaline with only tip darkened; subcostal cell very long, narrow; vein r–m basad of middle of discal cell; vein R4+5 distinctly haired; basal cubital cell wide; bulla absent.

Discussion.—The holotype of *nigricaudatum*, borrowed from the Bigot collection at Cambridge, England, is headless, leaving the true affinities of this extremely unusual fly a mystery. Its placement in the Trypetini in this study is entirely arbitrary. Except for the sharply bent subcostal vein, one is tempted to state that almost every other taxonomic character is unusual for not only the tribe but the family as well. The diagnosis and key characters explain the nature of these differences. The genus is known only from Brazil.

Genus *Laksyetsa* Foote

(Fig. 77)

Laksyetsa Foote 1978: 29. Type-species, *trinotata* Foote (orig. desig.).

Diagnosis.—Head higher than long; frons and face meeting in profile at angle of about 120°; face shining, spotted, oral margin markedly projecting, carina absent; frons haired, wider than long; 3 pairs lower fronto-orbitals, anterior one white; 2–3 pairs upper fronto-orbitals, all light colored; postoculars mixed black and white; parafacial spot present; antenna as long as face, 3d segment triangular but apex not sharply pointed, arista bare; 1 pair dorsocentrals, in transverse line through supra-alars; 3 pairs anepisternals, 1 pair katepisternals, 2 pairs anepimerals; 2 pairs scutellars, posterior pair as long as anterior; bulla present; vein R2+3 bent forward around it; vein r–m apicad of middle of discal cell; vein R4+5 bare; posterior extension of basal cubital cell nearly 2 times as long as its width at base.

Discussion.—The genus was described from a series of specimens from Oaxaca, Mexico, that are very closely related, especially in head characters, to several species of *Paracantha* Coquillett. The wing pattern and key characters will distinguish the genus readily. Only one species is known; it has no close relatives in the Nearctic Region.

Genus *Lamproxyna* Hendel

Lamproxyna Hendel 1914b: 96 (1914c: 64). Type-species, *nitidula* Hendel (orig. desig.).—Hering 1941a: 125 (in key, Peruvian gen.); 153 (rev., Peru).—Aczél 1949a: 275 (in neotrop. cat.).—Foote 1967: 57.29 (in neotrop. cat.).

Diagnosis.—In lateral view, frons curving into face without angle; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; mouthparts distinctly geniculate; 1 pair dorsocentrals, postsutural; 1 pair scutellars; wing pattern reticulate; stigma entirely dark; vein r–m apicad of middle of discal cell; bulla absent; abdominal tergum shining black, "nearly unhaired" (Hendel *1914c*).

Discussion.—The outstanding characteristics are the short-geniculate mouthparts and the shining black abdomen. The wing is largely dark with one or two rather large hyaline spots distad of the stigma in cell R1, a large one at the apex of vein R2+3 in cell R3, and numerous small hyaline spots scattered throughout the rest of the wing disk, clustered more closely in cell CuA1 and anal cell than elsewhere.

Neither of the two described species, both from Peru and Bolivia, was seen in this study.

Genus *Lamproxynella* Hering

(Fig. 78)

Lamproxynella Hering 1941a: 163. Type-species, *Euribia heliodes* Hendel (orig. desig.).—Hering 1942: 11 (key to species).—Aczél 1949a: 290 (in neotrop. cat.).—Foote 1967: 57.29 (in neotrop. cat.).—Steyskal 1974: 49 (desc., discussion of species).

Diagnosis.—In profile, face and frons meeting at distinct angle of about 90°; frons haired; 2 pairs lower fronto-orbitals; posterior notopleurals light colored; katepisternals and anepisternals light colored; 1 pair scutellars; delicate outstanding setae on hind tibia; wing reticulate, usually rather extensive though sometimes broken hyaline area immediately distad of subcostal cell in cell R1, apex of cell R5 usually with only small hyaline spot; vein R4+5 bare or haired; bulla absent.

Discussion.—Among the genera of Tephritini having one pair of scutellars and two pairs of lower fronto-orbitals, *Lamproxynella* is rather distinctive in its wing pattern. Many of the species have a rather extensive hyaline area in cell R1 immediately distad of the subcostal cell, often not broken by dark marks. Some wings, however, remind one of *Neotephritis* with a rather large light mark at the apex of cell R5. The genus appears to intergrade in some respects with *Dyseuaresta*, but these two genera, along with representatives of others bearing close resemblance, require a great deal of study. As defined here, the genus occurs in Central America, Colombia, and countries across mid-South America.

Genus *Lezca* Foote

(Figs. 26, 79)

Lezca Foote 1978: 27. Type-species, *tau* Foote (orig. desig.).

Diagnosis.—Head higher than long, in profile, face meeting frons at distinct angle of about 135°; frons haired; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars poorly developed; face shining, spotted, with deep antennal fovea and broadly rounded carina; antenna distinctly longer than face, 3d segment elongated and narrow, arista bare; 1 pair dorsocentrals, between transverse lines between supra-alars and postalars; acrostichals present; 1 pair anepisternals; 2 pairs scutellars; wing hyaline with prominent transverse 2-toned brown band and other dark marks; vein r–m closer to vein dm–cu than length of former; vein R2+3 slightly sinuate; vein R4+5 haired; posterior extension of basal cubital cell long.

Discussion.—A very distinctive trypetine, the single known species from Mexico is readily identifiable by use of the key characters. *Lezca* rather closely resembles *Cryptodacus* Hendel (Hendel *1914a, b*), *Cryptoplagia* Aczél (Aczél *1951*), and *Haywardina* Aczél (Aczél *1951*). However, veins r–m and dm–cu in *Cryptodacus* and *Cryptoplagia* are far removed from each other and are covered by separate transverse brown bands, whereas those of *Lezca* and *Haywardina* are situated very close together and are covered by a single brown band. The last two genera differ from each other in that the transverse brown band of *Haywardina* is very narrow and a second partial brown band is completely lacking.

Genus *Lilloaciura* Aczél

Lilloaciura Aczél 1953a: 191. Type-species, *curvinervis* Aczél (orig. desig.). Foote 1967: 57.30 (in neotrop. cat.).

Diagnosis.—In lateral view, face and frons meeting at angle of about 120°; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; postoculars expanded, whitish; mesonotum rather shining; 2 pairs anepisternals; 1 pair

scutellars; wing predominantly dark with large marginal incisions and hyaline discal spot; vein dm–cu at distinct angle to vein R4+5; vein R2+3 bent forward; veins R4+5 and M sinuate, latter haired; bulla absent.

Discussion.—No specimens representing this genus were seen during the study, but *curvinervis* and its possible congeners should not be difficult to recognize from the characters given in the key. The genus is known only by its type-species from Argentina. I have seen a female from Chubut Province, Argentina, which runs unsatisfactorily in the key to this genus. It is rather large, and the wing (about 7 mm) has a largely dark field with broad, bright hyaline incisions and rounded discal spots, more extensive and differently arranged than in *curvinervis*.

Genus *Metasphenisca* Hendel

(Fig. 80)

Metasphenisca Hendel 1914b: 92. Type-species, *Trypeta gracilipes* Loew (orig. desig.).—Malloch 1933: 265 (desc., discussion of *flexuosa* Bigot).—Munro 1947: 127 (rev., Africa).—Aczél 1953a: 184 (discussion of *flexuosa* Bigot).

Discussion.—The genus is included here because of its association with *flexuosa* Bigot made by Malloch (*1933*). Both Munro (*1947*) and Aczél (*1953a*) showed evidence that the association is incorrect and that no species of *Metasphenisca* actually occur in the New World.

Munro left unsolved the generic status of *flexuosa*, but Aczél expressed the possibility that it is a species of *Pseudoedaspis*. Taking into account the generic characters used in this study, this is not an acceptable solution as the latter genus possesses only one pair of scutellars and two pairs of lower fronto-orbitals (two and three, respectively, in *flexuosa*). Several specimens in very poor condition seen in this study are probably congeneric with *flexuosa*, but they possess wing patterns that differ in important details. Additional study material is needed to solve this problem.

Genus *Molynocoelia* Giglio-Tos

(Figs. 12, 81)

Molynocoelia Giglio-Tos 1893: 11. Type-species, *lutea* Giglio-Tos (monotypy).—Giglio-Tos 1895: 59 (desc.).—Hendel 1914b: 80 (in key to world gen.).—Hendel 1914c: 10 (in key, So. Amer. gen.).—Curran 1934b: 287 (in key, Amer. gen.).—Aczél 1949a: 191 (in neotrop. cat.).—Foote 1967: 57.31 (in neotrop. cat.).

Diagnosis.—Frons haired, in profile distinctly swollen; 2 pairs lower fronto-orbitals; 3 pairs upper fronto-orbitals; ocellars well developed; facial carina absent; antenna distinctly longer than face, 3d segment rounded apically, arista long haired; 1 pair dorsocentrals, in transverse line through postalars; acrostichals present; scutellum flat with vertical sides, 2 pairs scutellars; wing hyaline with prominent Y- and inverted V-shaped bands; vein r–m at or near middle of discal cell; vein R4+5 haired; posterior extension of basal cubital cell rather long.

Discussion.—The habitus of this genus resembles that of *Blepharoneura* Loew and *Hexachaeta* Loew, but the scutellum has only two pairs of bristles. The arista, mounted on an antenna distinctly longer than the face, is furnished with setulae longer than on any neotropical tephritid I have seen to date. It probably is the only neotropical representative of the trypetine tribe Gastrozonini. To date the genus has been known only by its type-species from Mexico, but I have recently seen an undescribed species from Brazil.

Genus *Myoleja* Rondani

(Figs. 13, 82)

Myoleja Rondani 1856: 112. Type-species, *Tephritis lucida* Fallén (orig. desig.).—Steyskal 1972d: 207 (key, No. Amer. species).

Myioleja, *Myioleia*, *Myiolia*, *Myolia*, errors or emendations.

Euleia, authors, not Walker.

Diagnosis.—In lateral view, frons and face meeting at angle of about 135°, frons rather swollen, haired; facial carina absent; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars fine, short; antenna as long

as, or shorter than, face, 3d segment rounded apically, arista bare; 1 pair dorsocentrals, slightly anterior to transverse line through postalars; acrostichals present; 2 pairs scutellars; wing hyaline with rather heavy brown transverse bands; vein r–m distinctly apicad of middle of discal cell; vein R4+5 haired; posterior extension of basal cubital cell long.

Discussion.—Most of the species of *Myoleja* in the New World may be recognized by the very short, slender ocellar bristle in combination with an elongated basal cubital cell and a fairly large, relatively unbroken dark area proximad of vein r–m extending from the costa to at least vein CuA1. In some respects, *Myoleja* resembles *Anomoia* Walker, especially as these two genera belong to a group of New World flies having very short, fine ocellars and some other associated characters. In fact, Hardy (*1973*, *1974*) indicated that in parts of the Oriental and Pacific Regions the two may eventually prove to be congeneric. His discussions of this situation should be consulted for further details. However, in the New World they may be separated easily by the characters given in the key. It is obvious that a solution to this interesting problem can be obtained only by a study of the fauna of both genera for the entire world.

The genus *Myoleja* is worldwide, with four nearctic species. Previous to this study it has never been reported south of Texas and Florida. I have seen specimens undoubtedly referable to the genus from the West Indies and Brazil, the latter probably an undescribed species. As specimens of the genus are not commonly seen, it would not be surprising to discover that *Myoleja* occurs throughout the Neotropical Region.

Genus *Neaspilota* Osten Sacken

(Fig. 83)

Aspilota Loew 1873: 286 (preocc. Förster 1862). Type-species, *Trypeta alba* Loew (Coquillett 1910: 511).

Neaspilota Osten Sacken 1878: 192 (new name for *Aspilota* Loew).—Curran 1934b: 289 (in key, Amer. gen.).—Benjamin 1934: 34 (desc., key to No. Amer. species).—Quisenberry 1949b: 83 (key, No. Amer. species).—Foote and Blanc 1963: 33 (rev., Calif.).

Aspilomyia Hendel 1907: 98 (new name for *Aspilota* Loew). Type-species, *Trypeta alba* Loew (automatic).

Neoaspilota, error or emendation.

Diagnosis.—Frons haired; head and body bristles generally light colored; palpi not usually projecting anteriorly beyond oral margin; wing rarely more than 4 mm long; disk hyaline, stigma usually with yellowish cast; pattern, if present, consisting at most of partial dark bands or isolated dark marks; vein R4+5 bare.

Discussion.—Ten species of this strictly New World genus are distributed throughout the United States and southern Canada. The species in Mexico have not yet been identified, but there is no doubt of their association with this genus. Benjamin (*1934*), Quisenberry (*1949b*), and Foote and Blanc (*1963*) presented keys to all or some of the North American species.

Genus *Neoacanthoneura* Hendel

Neoacanthoneura Hendel 1914b: 82 (1914c: 32). Type-species, *magnipennis* Hendel (orig. desig.).—Hering 1941a: 123 (in key, Peruvian gen.); 126 (desc.).—Aczél 1949a: 182 (in neotrop. cat.).—Foote 1967: 57.31 (in neotrop. cat.).

Discussion.—The genus is included here because of its previous association with the Tephritidae by Hendel, Hering, Aczél, and myself. The venation and pattern of the wing shown by Hendel (*1914b*) indicate that *Neoacanthoneura* without doubt is an otitid closely related to the genus *Aciuroides* Hering (Hering *1941d*), as pointed out by my colleague George C. Steyskal.

Genus *Neorhabdochaeta* Malloch

(Fig. 84)

Neorhabdochaeta Malloch 1941b: 124. Type-species, *anduzei* Malloch (orig. desig.).—Aczél 1949a: 181 (in neotrop. cat.).—Foote 1967: 57.31 (in neotrop. cat.).

Diagnosis.—Frons matte, bare; 3 pairs lower fronto-orbitals, anteriormost pair rather small and light colored; 3 or more pairs upper fronto-orbitals, all light colored; face shining, spotted; lunule projecting into small triangle between antennal bases; parafacial spot present; 1 pair dorsocentrals, very close to suture; 2 pairs scutellars in addition to long, expanded, whitish hairs at base of scutellum; femora of front legs with long, expanded, whitish hairs; scutum with setulae arranged

to leave numerous bare patches; wing rather narrow, pattern similar to species of *Paracantha;* veins R2+3 and R4+5 sinuate; posterior extension of basal cubital cell rather long; bulla present; abdomen with long, expanded, whitish hairs laterally and sometimes along posterior margins of tergites.

Discussion.—*Neorhabdochaeta* has been placed in the Schistopterinae by several authors owing more to the rather deep costal break than for any other reason. Its affinities with *Paracantha*, however, are so close that to place the two genera in separate subfamilies is strictly untenable. *Paracantha* Coquillett, *Neorhabdochaeta* Malloch, and *Laksyetsa* Foote form a distinct group, which is more closely allied to other genera of Ditrichini and naturally exits in the key in that tribe. *Neorhabdochaeta*, previous to this study known only from Venezuela, is also represented by a single specimen in very poor condition from Central America. Further study and additional specimens will be required to determine its taxonomic status.

Genus *Neorhagoletis* Hendel

Neorhagoletis Hendel 1914b: 91 (1914c: 30). Type-species, *latifrons* Hendel (orig. desig.).—Aczél 1949a: 240 (in neotrop. cat.).—Aczél 1953a: 109 (in key, genera of Oedaspidinae).—Foote 1967: 57.31 (in neotrop. cat.).

Diagnosis.—Three pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; 2 pairs dorsocentrals, one of them presutural; subcostal cell much longer than wide; vein r–m at, or very close to, middle of discal cell; vein R4+5 bare; extension of basal cubital cell rather long; bulla absent; abdominal tergum shining black.

Discussion.—This distinctive genus, known only by its type-species from Bolivia, was not seen in this study. However, I have seen a female specimen from Salesopolis, State of São Paulo, Brazil, with a badly shrunken head, which at least superficially resembles this genus in sharing many characters, including the two pairs of dorsocentrals. It can hardly be considered congeneric, however, as it has only two pairs of lower fronto-orbitals, vein r–m is situated distinctly apicad of the middle of the discal cell, and the wing bands are more diagonally placed as in species of *Cecidochares*. This specimen is not in good enough condition for description.

Genus *Neotaracia* Foote

(Fig. 85)

Neotaracia Foote 1978: 31. Type-species, *Acrotaenia imox* Bates (orig. desig.).

Diagnosis.—Frons bare; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, posterior pair light colored; all setae in postocular row light colored; 1 pair dorsocentrals, emerging directly from suture; both pairs notopleurals unicolorous; 2 pairs scutellars, posterior pair less than 0.5 times as long as anterior; vein r–m at, or near, middle of discal cell; vein R2+3 straight or nearly so; posterior extension of basal cubital cell very short; bulla absent; costa remarkably bowed anteriorly near middle of wing, most of cell R1 dark except small hyaline spot immediately apicad of subcostal cell and one at extreme apex descending into cell R2+3; several other hyaline marks present.

Discussion.—This genus was established to recognize the distinctive nature of *imox* (Bates), which differs from *Acrotaenia testudinea* (Loew) in several important respects other than the wing pattern. This strictly New World genus is known from Mexico, Central America, the West Indies, northern South America, and Brazil. Foote (in press) has revised the New World species.

Genus *Neotephritis* Hendel

(Figs. 27, 86, 87)

Neotephritis Hendel 1935: 54. Type-species, *Trypeta finalis* Loew (orig. desig.).—Hering 1947a: 6 (taxon. note).—Aczél 1949a: 284 (in neotrop. cat.).—Foote 1967: 57.31 (in neotrop. cat.).—Steyskal 1972c: 414 (key to known species).

Diagnosis.—In profile, frons and face meeting at distinct angle of about 110°; frons haired; 3 pairs lower fronto-orbitals; posterior pair notopleurals light colored; katepisternals and anepimerals both dark; 2 pairs scutellars, posterior pair longer than 0.5 times anterior

pair; hind tibia with row of delicate, outstanding setae; wing surface dark, reticulate, a number of hyaline marks immediately distad of subcostal cell semicoalescing to form rather distinct inverted triangle, apex of cell R5 usually dark; vein R4+5 bare; bulla absent.

Discussion.—This strictly New World genus is represented by three species in the United States. *N. finalis* (Loew) is common in collections, is widespread in the States, and extends into northern Mexico; *N. inornata* (Coq.) is primarily western United States in distribution; and *N. rava* Foote is known so far only from Arizona. Congeners also occur farther south into Central America and northern South America, some of which very probably have not yet been described. Steyskal (*1972c*) presents a very useful key to the 11 described species based on material then in the U.S. National Museum. This key and the generic concept presented here include a number of South American species that lack the typical dark area in the apex of cell R5 and the distinctive inverted hyaline triangle apicad of the subcostal cell. Whether the latter species are truly congeneric with *finalis* (Loew) remains to be determined.

Genus *Oedicarena* Loew

(Fig. 88)

Oedicarena Loew 1873: 247. Type-species, *Trypeta tetanops* Loew (orig. desig.).—Curran 1934b: 289 (in key, Amer. gen.).—Aczél 1949a: 251 (in neotrop. cat.).—Aczél 1954a: 74 (in partial key to gen.).—Foote 1960c: 145 (taxon. discussion).—Foote 1967: 57.32 (in neotrop. cat.).—Steyskal and Foote 1977: 152 (key to known species, discussion).

Rhagoletoides Foote 1960c: 145. Type-species, *Spilographa latifrons* Wulp (orig. desig.).

Diagnosis.—Medium-sized to large brownish-yellow flies with few or no dark body markings; frons swollen in lateral view, haired; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars well developed; face with prominent carina, swollen at middle in lateral view; gena about as high as eye; antenna shorter than face, 3d segment rounded apically, arista bare; 1 pair dorsocentrals, between transverse lines across supra-alars and postalars; acrostichals present; 2 pairs scutellars; wing hyaline with prominent S-shaped band; vein r-m at about middle of discal cell; vein R4+5 haired only at base.

Discussion.—Long known to occur only in the Southwestern United States and Mexico, *Oedicarena* is also represented in the West Indies by a possibly undescribed species. It is a distinctive genus easily identified by the key characters. Steyskal and Foote (*1977*) keyed the known species.

Genus *Orellia* Robineau-Desvoidy

(Fig. 89)

Orellia Robineau-Desvoidy 1830: 765. Type-species, *flavicans* Robineau-Desvoidy (monotypy) = *punctata* Schrank.—Curran 1934b: 291 (in key, Amer. gen.).—McFadden and Foote 1961: 253 (rev., No. Amer.).—Foote and Blanc 1963: 38 (rev., Calif.).—Steyskal and Foote 1977: 146 (taxon. note).

Diagnosis.—Frons bare; oral margin produced anteriorly; palpi usually projecting anterior to anterior oral margin; head and body bristles comparatively dark; 2–3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars well developed; wing rarely less than 4 mm long, pattern of dark transverse bands or combination of bands and spots on hyaline field; vein R4+5 haired only at extreme base.

Discussion.—One of only three New World genera in the tephritine tribe Terelliini, *Orellia* is primarily palaearctic, where more than 15 species are widespread. Only three species occur in North America, as far as is known. One of these is holarctic. McFadden and Foote (*1961*) keyed the North American species, but *undosa* (Coq.) has been referred to the genus *Chaetostomella* by Steyskal and Foote (*1977*). *Orellia* is represented in this study by a single female from near Guadalajara, Mexico, the only member of the genus I have ever seen south of the United States.

Genus *Ostracocoelia* Giglio-Tos

(Fig. 90)

Ostracocoelia Giglio-Tos 1893: 10. Type-species, *mirabilis* Giglio-Tos (monotypy).—Giglio-Tos 1895: 44 (redesc., figure of wing).—Foote 1967: 57.32 (in neotrop. cat.).

Ceratitoedaspis Aczél 1953a: 111. Type-species, *palpalis* Aczél (orig. desig.).—Foote 1967: 57.20 (in neotrop. cat.).

Diagnosis.—Frons bare; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; all postoculars dark, slender, pointed; face spotted; facial carina present; 1 pair dorsocentrals, between transverse lines through supra-alars and postalars; notopleurals concolorously dark; 1 pair anepisternals; wing distinctive in that subcostal cell is shorter than its greatest width, and costa is markedly depressed apicad of it; hyaline with transverse dark bands; veins R2+3 and R4+5 rather sinuate, latter bare; bulla absent; vein r-m at or very close to middle of discal cell.

Discussion.—Although I have not been able to examine the holotype of *mirabilis* Giglio-Tos, his description and figure of the wing of that species leave no doubt that it is congeneric with Aczél's *Ceratitoedaspis*. A determination of the conspecificity of the two type-species should be made to prove out the synonymy given here. Previously known only from Mexico and Guatemala, *Ostracocoelia* is represented in the U.S. National Museum collection by specimens from several Mexican localities and one specimen, very probably also congeneric, from Argentina.

Genus *Oxyna* Robineau-Desvoidy

(Figs. 28, 91)

Oxyna Robineau-Desvoidy 1830: 755. Type-species, *Musca parietina* Linnaeus (Rondani 1856: 110).—Hendel 1914b: 96 (in key, world gen.).—Quisenberry 1949a: 71 (rev., No. Amer.).—Foote and Blanc 1963: 40 (rev., Calif.).

Diagnosis.—In lateral view, face and frons meeting at distinct angle of slightly more than 90°; head about as high as long; frons bare; only 1 dark pair lower fronto-orbitals, although some stout, rather long white bristles may also be present; 2 pairs concolorous upper fronto-orbitals; mouthparts distinctly geniculate; anterior notopleural dark, posterior light colored; katepisternals black; anepimerals light colored; 2 pairs scutellars, posterior pair more than 0.5 times as long as anterior pair; legs completely without rows of spines; wing pattern tending to be banded, but bands definitely reticulate; vein R4+5 haired at base; bulla absent.

Discussion.—*Oxyna*, rather closely related to *Dioxyna* and *Paroxyna*, is distinctive among all New World genera in having species with only one dark lower fronto-orbital, although some of the white parafrontal setulae may be nearly as long. The genus is primarily eastern palaearctic. Quisenberry (*1949a*) published a key to the three North American species, which are known only from the Western United States. I have seen an unidentified specimen from Mexico, the only record of the genus from south of Texas.

Genus *Paracantha* Coquillett

(Figs. 9, 29, 92)

Paracantha Coquillett 1899: 264. Type species, *Trypeta culta* Wiedemann (orig. desig.).—Cresson 1914: 277 (taxon., nomencl. comments).—Hendel 1914b: 93 (in key, world gen.).—Hendel 1914c: 50 (in key, So. Amer. gen.).—Malloch 1933: 270 (rev., Chilean species).—Curran 1934b: 291 (in key, Amer. gen.).—Benjamin 1934: 29 (desc.).—Hering 1940b: 53 (key to known species).—Malloch 1941a: 32 (key, known species).—Aczél 1949a: 260 (in neotrop. cat.).—Aczél 1952b: 199 (partial rev.).—Foote 1967: 57.32 (in neotrop. cat.).

Carphotricha, authors, not Loew.

Diagnosis.—Frons wide, bare; 3 pairs lower fronto-orbitals, anterior pair smaller than other 2 and light colored; 3 pairs upper fronto-orbitals definitely mesal to lowers, anterior pair anterior to anterior pair of uppers, all light colored; face shining, spotted; 1 pair dorsocentrals, between suture and transverse line through supra-alars; 2 pairs scutellars, posterior pair more than 0.5 times as long as anterior pair; scutal setulae arranged to leave bare spots; wing rather narrow, bicolored brown with characteristic dark rays to anterior and apical margin; vein R2+3 tending to be sinuate especially in species with bulla; vein R4+5 bare or haired only at base; many species with large, expanded, light-colored bristles laterally on abdomen.

Discussion.—This genus, together with *Neorhabdochaeta* Malloch and *Laksyetsa* Foote, forms a group of genera that has its main affinities with the Ditrichini, despite the fact that *Neorhabdochaeta* has been placed by

several authors in the Schistopterinae (see discussion of that genus). Several closely related palaearctic genera, *Noeeta* Robineau-Desvoidy among them, are also closely related to *Paracantha* and require further study. One is tempted to believe that all these genera may eventually be shown to constitute a supergeneric group within or equivalent to the Ditrichini.

Species assignable to *Paracantha* occur most frequently in North America (including Mexico), Central America, and northern and central South America. Malloch (*1941a*) keyed the (then) known species, and Aczél (*1952b*) presented a partial revision.

During this study I have seen a single male from Peru with a typical *Paracantha*-like wing pattern, but the face and frons are entirely matte, the face is unspotted, and the anterior pair of upper fronto-orbitals is long and black. More specimens are required to determine its generic status.

Genus *Parastenopa* Hendel

(Fig. 93)

Parastenopa Hendel 1914b: 88 (1914c: 27). Type-species, *arcuata* Hendel (orig. desig.).—Hendel 1931: 17 (taxon.).—Lima 1934b: 127 (biol. note).—Aczél 1949a: 248 (in neotrop. cat.).—Aczél 1951: 254 (in generic key).—Aczél 1955c: 167 (rev.).—Foote 1967: 57.33 (in neotrop. cat.).

Mesaraelia Blanchard 1929: 461. Type-species, *elegans* Blanchard (orig. desig.).—Hendel 1931: 17 (taxon. note).

Mesrelia, error.

Kartabia Curran 1934a: 434. Type-species, *anastrephoides* Curran (orig. desig.).

Diagnosis.—Frons and face meeting in curve without visible angle; frons haired; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; face without carina; ocellars weak, short; antenna as long as face, 3d segment rounded apically, arista bare; 1 pair dorsocentrals, very close to transverse line through supra-alars; acrostichals present; 2 pairs scutellars; wing relatively broad, mostly dark at center with 2 narrow dark oblique rays to margin; subcostal cell not as long as greatest width; vein r–m distinctly apicad of middle of discal cell; vein R4+5 haired.

Discussion.—This distinctive neotropical genus is known to occur in Guyana, Colombia, Bolivia, Argentina, and Brazil. Specimens are not collected in large numbers, but six species have been described. Aczél (*1955c*) keyed and described the known species. The broad wing is mainly dark with hyaline marks as shown in figure 93. The wing patterns of all species are similar but show differences at the species level.

Genus *Paroxyna* Hendel

(Figs. 32, 108)

Paroxyna Hendel 1927: 146. Type-species, *Trypeta tessellata* Loew (orig. desig.).—Benjamin 1934: 40 (diagnosis; discussion of some neotrop. species).—Curran 1934b: 293 (in key, Amer. gen.).—Hering 1941a: 125 (in key, Peruvian gen.); 158 (key, Peruvian species).—Hering 1944a: 6 (taxon.).—Aczél 1949a: 286 (in neotrop. cat.).—Munro 1957: 919 (desc.; key and discussions, African species).—Foote and Blanc 1963: 46 (key, Calif. species).—Foote 1967: 57.34 (in neotrop. cat.).—Novak 1974: 1 (rev., U.S. and Canada).

Ensina, authors, not Robineau-Desvoidy.

Diagnosis.—In lateral view, face meeting frons at distinct angle of about 120°; frons bare; 2 pairs lower fronto-orbitals; proboscis always geniculate; both pairs notopleurals dark; katepisternal bristle dark; anepimeral bristle light colored; 2 pairs scutellars, posterior pair less than 0.5 times as long as anterior pair; delicate setae present in rows on tibiae and femora of midlegs and hind legs; wing with dark disk, which is more or less evenly reticulated, usually with 3 hyaline spots in cell R1 apicad of subcostal cell, usually rounded hyaline spot in subcostal cell; vein R5 bare; bulla absent.

Discussion.—The genus *Paroxyna* is worldwide in distribution; Hardy (*1974*) indicated that more than 190 species have been described. However, the Mexican and neotropical species are not well described, and I am convinced there is a large number of undescribed species in addition to the 20 or so that are widespread south of Texas and Florida. The genus is commonly found, but details of biology are largely unknown. Novak (*1974*) revised the genus in the United States and Canada, but no guide to species south of the United States is available.

Genus *Plaumannimyia* Hering

(Fig. 94)

Plaumannimyia Hering 1938: 190. Type-species, *pallens* Hering (orig. desig.).—Hering 1941a: 158 (part) (desc.).—Aczél 1949a: 283 (part) (in neotrop. cat.).—Foote 1967: 57.35 (part) (in neotrop. cat.).—Steyskal 1972a: 130 (generic relationships).

Diagnosis.—In profile, face and frons meeting at distinct angle of about 90°; frons bare; 2 pairs lower fronto-orbitals; posterior pair notopleurals light colored; katepisternals and anepimerals light colored; 2 pairs scutellars, posterior pair less than 0.5 times as long as anterior pair; midtibiae and hind tibiae without rows of outstanding setae; wing light brown with reticulation consisting of small hyaline spots; vein R4+5 bare; bulla absent.

Discussion.—I have seen a series of males and females from Nova Teutonia, Brazil, possessing all the characteristics of *pallens* Hering, which was originally described from the same location. Hering's illustration of the wing pattern is not precise, but the distribution of hyaline spots is almost exactly the same, and other characters agree completely. Strictly speaking, this genus is known only from Brazil. *Trypanea* [sic] *reticulata* Hendel has been commonly regarded as belonging to this genus but is clearly not congeneric with *pallens*. It differs in having a differently shaped head, haired frons, the enlarged fore femora and distinctive external male genitalia of *Euaresta*, a much broader and shorter stigma, R4+5 haired, and a rather obliquely situated vein r–m. Steyskal (*1972a*) discussed this in considerable detail and has assigned this species to *Euaresta* based on the associated male characters and other features. *Tephritis apicata* Becker, the only other species ever assigned to *Plaumannimyia*, may eventually be proved to be a synonym of *reticulata*.

Genus *Polionota* Wulp

(Figs. 30, 95)

Polionota Wulp 1899: 409. Type-species, *Acrotoxa mucida* Giglio-Tos (orig. desig.).—Hendel 1914b: 87 (in key, world gen.).—Hendel 1914c: 26 (in key, So. Amer. gen.).—Curran 1934b: 291 (in key, Amer. gen.; taxon. note).—Hering 1953: 7 (key, known species).—Foote 1967: 57.36 (in neotrop. cat.).

Polyonota; Aczél 1949a: 247 (in neotrop. cat.; error or emendation).

Diagnosis.—In profile, frons distinctly swollen, bare; 3 pairs lower fronto-orbitals, very strongly developed, mounted on narrow raised ridge; 2 pairs upper fronto-orbitals; ocellars well developed; postoculars yellowish, as are most body bristles; facial carina present; antenna shorter than face, 3d segment rounded apically, arista bare; 2 pairs dorsocentrals, one of them presutural; acrostichals present; 2 pairs scutellars; wing dark with single hyaline triangle in cell R1 immediately apicad of subcostal cell and prominent hyaline incisions along posterior border; vein r–m apicad of middle of discal cell; vein R4+5 haired.

Discussion.—The genus *Polionota* is readily recognized by the two pairs of dorsocentrals, a character shared by few neotropical genera, and the more or less "aciuroid" wing pattern. The bodies of all the specimens I have seen are rather dark. In his description of *mucida*, Giglio-Tos stated, "... Torace nero, coperto di pubescenza cenerina...," but none of the specimens before me have a frankly black thorax. In other respects, however, the brief description fits all the specimens I consider to be congeneric.

The aciuroid wing pattern departs from that of most trypetines; the slender, dark, sharply pointed postoculars place the genus in the Trypetinae, however arbitrary that decision. Two of the males I have seen from Mexico have an extremely unusual antenna.

Four described species occur in Mexico, Central America, and Bolivia.

Genus *Polymorphomyia* Snow

Polymorphomyia Snow 1894: 165. Type-species, *basilica* Snow (monotypy). Wulp 1899: 410 (in generic key).—Hendel 1914b: 87 (in key, world gen.).—Hendel 1914c: 28 (in key, So. Amer. gen.; discussion).—Curran 1931: 14 (in key, Puerto Rico and Virgin Isl.).—Bates 1933: 51 (desc.).—Curran 1934b: 291 (in key, Amer. gen.).—Aczél 1949a: 249 (in neotrop. cat.).—Aczél 1951: 255 (in key, Trypetini).—Aczél

1953a: 148 (rev.).—Foote 1967: 57.36 (in neotrop. cat.).—Korytkowski 1971: 446 (desc., key to known species).

Diagnosis.—Distinctive species with anteriorly bowed costa resulting in very broad wing with dark disk and narrow anteroapical hyaline arc; in lateral view, head narrow-oval, frons and face curved into each other rather than meeting at distinct angle; frons haired; 3 pairs lower fronto-orbitals; 1 pair upper fronto-orbitals; postoculars expanded, whitish; mesonotum and abdominal tergum subshining black, overlayed with contrasting expanded white setulae; 1 pair dorsocentrals, between suture and transverse line through supra-alars; posterior notopleural light colored; 2 pairs anepisternals; 2 pairs scutellars; vein R2+3 sinuate; vein R4+5 bare, veins r–m and dm–cu close together, latter at distinct angle to former; bulla absent.

Discussion.—Korytkowski (*1971*) offers the most recent key and revision of the four known species that occur only in Mexico, the West Indies, and from Ecuador south to Brazil. This broad-winged genus closely resembles *Pseudeutreta* Hendel in having a very broad, dark wing with an apical hyaline arc, but it differs from that genus in lacking the head characters that would otherwise place it in the Ditrichini. Aczél (*1953a*) provided additional data on the species.

Genus *Procecidochares* Hendel

(Fig. 96)

Procecidochares Hendel 1914b: 91 (1914c: 42). Type-species, *Trypeta atra* Loew (orig. desig.).—Aldrich 1929: 1 (rev.).—Lima 1934b: 123 (desc., biol.).—Curran 1934b: 291 (in key, Amer. gen.).—Aczél 1949a: 188 (in neotrop. cat.).—Aczél 1953a: 110 (in key, genera of Oedaspidinae); 125 (rev.).—Foote 1967: 57.36 (in neotrop. cat.).

Oedaspis, authors, not Loew.

Diagnosis.—Frons bare; 2 pairs lower fronto orbitals; 1 pair dark upper fronto-orbitals; postoculars light colored, slender, pointed; facial carina absent; scutum and scutellum shining; 1–2 pairs dorsocentrals, 1 presutural; both notopleural pairs dark; 1 pair anepisternals; wing hyaline with distinct brown oblique bands; vein r–m apicad of middle of discal cell; vein R2+3 sinuate, vein R4+5 gently bent, bare; bulla absent.

Discussion.—*Procecidochares* is a strictly New World genus, having 11 described species and several additional undescribed ones in the United States and Canada. The genus has been known only from Mexico in the area studied here, but I have recently seen additional specimens from Colombia and Peru that may represent undescribed species. The key characters serve to distinguish the genus from *Cecidochares* Bezzi, which it rather closely resembles.

Genus *Procecidocharoides* Foote

(Fig. 97)

Procecidocharoides Foote 1960g: 671. Type-species, *Trypeta (Oedaspis) penelope* Osten Sacken (orig. desig.).

Diagnosis.—Frons bare; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, both either light or dark; postoculars light colored, expanded; facial carina absent; notum and abdominal tergum shining; 2 pairs dorsocentrals, 1 of them presutural; both pairs notopleurals dark; 1 pair anepisternals; wing rather slender, hyaline with prominent dark transverse and oblique bands; vein r–m apicad of middle of discal cell; veins R2+3 and R4+5 gently curved, latter bare; bulla absent.

Discussion.—Prior to this study, this genus has not been reported from south of the United States, although it might well have been expected to occur at least in Mexico. I have seen three specimens from Pueblo, Mexico, which I have identified without hesitation as *pullata* Foote. The four species, three from the Western United States and the fourth widespread from the east coast west to Michigan, have been keyed by Foote (*1960g*).

Genus *Protensina* Hendel

(Fig. 31)

Protensina Hendel 1914b: 95 (1914c: 64). Type-species, *longiceps* Hendel (orig. desig.).—Hering 1941a: 152 (taxon.).—Aczél 1949a: 274 (in neotrop. cat.).—Foote, 1967: 57.37 (in neotrop. cat.).—Steyskal 1970: 158 (taxon.).

Diagnosis.—In profile, frons and face meet at distinct angle of about 90°; head distinctly longer than high; parafacial about 0.5 times as wide as eye; frons bare; 3 pairs lower fronto-orbitals; 1 pair upper fronto-orbitals (all relatively slender and short); mouthparts not geniculate, labella extending posteriorly beyond head margin; notopleurals concolorously dark; anepisternal, katepisternal, and anepimeral bristles concolorously dark; 2 pairs scutellars, about equal in length; wing disk mainly hyaline with small indistinct dark spots; subcostal cell dark with lighter marks; vein r–m apicad of middle of discal cell; vein R4+5 bare; bulla absent.

Discussion.—Steyskal (*1970*) discussed the history and status of this Peruvian genus in detail. Of all characters used in this study to define generic limits, the profile of the head as described in the key is apparently the only one that distinguishes this genus from *Ensina*. A much more detailed study of the species is required. In addition to the type-species, I have seen another Peruvian specimen that may be undescribed. See also discussion of *Ensina*.

Genus *Pseudacrotaenia* Hendel

(Fig. 98)

Acrotaenia, subgenus *Pseudacrotaenia* Hendel 1914b: 98 (1914c: 58). Type-species, *Carphotricha vespillo* Schiner (orig. desig.).—Bates 1934: 8 (taxon.).—Hendel 1935: 54 (taxon. note).—Hering 1941a: 124 (in key, Peruvian gen.); 150 (key to species, Peru).—Aczél 1949a: 269 (in neotrop. cat.).—Foote 1967: 57.37 (in neotrop. cat.).

Diagnosis.—Frons haired; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, anterior pair anterior to posterior pair of lowers, both light colored; postoculars mixed black and expanded white; facial carina absent; 2 pairs scutellars, apical pair longer than 0.5 times basal pair; wing principally dark with small hyaline discal spots and marginal incisions, especially apically; vein r–m apicad of middle of discal cell; bulla absent.

Discussion.—The 10 described species of this strictly New World genus occur from Mexico south to Brazil. This relatively large number of species is remarkable because the genus is seldom found or represented in collections. Its affinities lie most closely with *Acrotaenia* Loew, from which it can easily be distinguished by characters given in the key and respective diagnoses. The genus has not been recently revised. Hering (*1941a*) keyed only the species known in Peru.

Genus *Pseudeutreta* Hendel

(Fig. 99)

Pseudeutreta Hendel 1914b: 86 (1914c: 56). Type-species, *Trypeta adspersa* Wiedemann (orig. desig.).—Bates 1933: 51 (desc.).—Aczél 1949a: 266 (in neotrop. cat.).—Foote 1967: 57.38 (in neotrop. cat.).

Polymorphomyia (part), Aczél 1953a: 149 (desc., key to species).

Diagnosis.—Frons matte, haired; 3 or more pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, posterior pair light colored; face subshining, unspotted; parafacial spot present; 1 pair dorsocentrals, very close to suture; 1 pair scutellars; wing relatively broad with apical or subapical hyaline arc and often numerous small discal hyaline spots; vein r–m at or near middle of discal cell; veins R2+3 and R4+5 sinuate, latter haired dorsally; bulla absent.

Discussion.—Aczél (*1953a, p. 155*) revised and keyed the known species, including them in his key to the species of *Polymorphomyia* Snow. However, despite their general resemblance, these two genera are abundantly distinct as shown by characters presented in the key (see also discussion of *Polymorphomyia*). Previous to this study, species of *Pseudeutreta* were known only from Bolivia to Brazil, but I have seen specimens recently from Mexico and Chile as well.

Genus *Pseudoedaspis* Hendel

(Fig. 100)

Pseudoedaspis Hendel 1914b: 86 (1914c: 44). Type-species, *biseta* Hendel (orig. desig.).—Aczél 1949a: 257 (in neotrop. cat.).—Aczél 1953a: 148 (rev.).—Foote 1967: 57.39 (in neotrop. cat.).

Diagnosis.—Frons and face meeting at distinct angle somewhat more than 90°; frons

bare; 2 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, posterior pair light colored; postocular row with mixed black and whitish setae; 1 pair dorsocentrals, very close to suture; posterior notopleurals light colored; 1 pair scutellars; veins R2+3 and R4+5 gently bowed, latter bare; bulla absent.

Discussion.—Since members of this genus are not commonly found, the forms are not well known. All three species were originally described from Argentina, but I have seen several Chilean specimens (as yet unidentified to species) that add the only new material to the genus since Aczél (*1953a*) revised it and keyed the species. The wing patterns of *Pseudoedaspis* very closely resemble those of many species of *Aciurina* Curran, but the two genera can be distinguished easily by chaetotaxic characters.

Genus *Pseudophorellia* Lima

(Fig. 191)

Pseudophorellia Lima 1934c: 139. Type-species, *maculata* Lima (orig. desig.).—Aczél 1949a: 249 (in neotrop. cat.).—Foote 1967: 57.39 (in neotrop. cat.).

Diagnosis.—In lateral view, face and frons meeting at about 150°; face with distinct carina; 3 pairs lower fronto-orbitals; 1 pair upper fronto-orbitals; antenna about as long as face, 3d segment rounded apically, arista haired; 1 pair dorsocentrals, in transverse line through postalars; acrostichals absent; scutellum flat, with vertical sides, 2 pairs scutellars; wing hyaline with brown transverse bands; vein r–m apicad of middle of discal cell, vein R4+5 haired; extension of basal cubital cell long.

Discussion.—The haired arista and absence of acrostichals place this genus as similar, in several additional respects, to *Hetschkomyia* Hendel, but I have seen no specimens in complete enough condition to be able to study its true relationships. Lima (*1934c*, *1953b*) described the two known species, one from Panama and one from Brazil. Two specimens in poor condition, one from Puerto Rico and one from Jamaica, appear to be congeneric except possibly for the presence of a second, well-developed, upper fronto-orbital bristle. The condition of *stonei* (Lima), the Panamanian species, does not allow a proper comparison.

Genus *Pseudopolionota* Lima

Pseudopolionota Lima 1935b: 200. Type-species, *radians* Lima (orig. desig.).—Aczél 1949a: 257 (in neotrop. cat.).—Aczél 1953a: 149 (in key to Group I Tephritinae).—Foote 1967: 57.39 (in neotrop. cat.).

Diagnosis.—Frons somewhat swollen in lateral view; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; postoculars light colored, somewhat expanded; scutum subshining; 1 pair dorsocentrals, between suture and transverse line through supra-alars; 2 pairs anepisternals; 2 pairs scutellars; wing mainly dark with marginal hyaline incisions and discal spots; vein r–m at middle of discal cell; veins R2+3 and R4+5 gently recurved, latter haired dorsally; bulla absent.

Discussion.—This Brazilian genus, no specimens of which were seen in this study, has a wing pattern rather similar to that of *Xanthaciura* Hendel with two large inverted triangles in cell R1 immediately distad of the subcostal cell and three diagonal hyaline fascia in the distal one-fourth of the wing disk. Lima's original description is the only detailed information available, but it is sufficient to justify a separate generic status for *radians*.

Genus *Pyrgotoides* Curran

(Fig. 10)

Pyrgotoides Curran 1934a: 289. Type-species, *crassipes* Curran (orig. desig.).—Aczél 1949a: 251 (in neotrop. cat.).—Aczél 1954a: 74 (taxon.).—Foote 1967: 57.40 (in neotrop. cat.).

Diagnosis.—In lateral view, frons rounded into face, 2 not meeting at angle; frons bare; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars well developed; face shining, without carina, spotted; antenna shorter than face, 3d segment rounded apically, arista bare; 1 pair dorsocentrals, in transverse line through supra-alars; acrostichals present; scutellum swollen, rounded

in profile, 3 pairs scutellars; vein r–m apicad of middle of discal cell; vein R4+5 bare; all tibiae swollen; abdomen with inconspicuous dorsal setation, widest at posterior margin of 3d segment.

Discussion.—This extremely rare species, the only known member of the genus and known only from Panama, is distinctive enough to be recognized by means of the key characters and illustrations. The species is aptly named because of its close resemblance to species of Pyrgotidae. Only two specimens are known to exist in collections.

Genus *Rhachiptera* Bigot

(Fig. 102)

Rhachiptera Bigot 1859: 313. Type-species, *limbata* Bigot (monotypy).—Hendel 1914b: 93 (in key, world gen.).—Hendel 1914c: 53 (in key, neotrop. gen.).—Aczél 1949a: 263 (in neotrop. cat.).—Foote 1967: 57.40 (in neotrop. cat.).

Percnoptera Philippi 1873: 307. Type-species, *angustipennis* Philippi = *limbata* Bigot (monotypy).

Eupterocalla Brèthes 1916: 12. Type-species, *opazoi* Brèthes = *limbata* Bigot (orig. desig.).

Diagnosis.—Frons shining, bare; 2 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, posterior pair light colored; face shining, spotted; parafacial spot present; 1 pair dorsocentrals, very close to transverse line through supra-alars; 2 pairs scutellars, about equal in length; wing rather narrow, disk mostly of 2 shades of brown but posterior margin of wing hyaline and rather straight; vein r–m at or near middle of discal cell; vein R4+5 haired; bulla absent.

Discussion.—Species of this rather distinctive genus occur, as far as is known, only in South America and have been recorded from Chile, Bolivia, Argentina, and Brazil. Based on specimens seen in this study, as yet unidentified to species, this range has been expanded to include Colombia and Peru. In many respects the genus closely resembles *Strobelia* Rondani, from which it is distinguished by the hyaline, relatively straight, posterior wing margin, and evidence suggests that some species of *Strobelia* may actually be congeneric. In any case, these two genera represent a complex of species deserving further study.

Genus *Rhagoletis* Loew

(Figs. 7, 103)

Rhagoletis Loew 1862: 44. Type-species, *Musca cerasi* Linnaeus (monotypy).—Wulp 1899: 408 (desc. of *striatella* Wulp).—Hendel 1914b: 91 (in key, world gen.).—Hendel, 1914c: 29 (in key, So. Amer. gen.); 67 (discussion of 3 species).—Cresson 1929: 401 (rev.).—Malloch 1933: 264 (taxon. discussion).—Benjamin 1934: 12 (diagnosis, discussion of *pomonella* ex Mex.).—Curran 1934b: 289 (in key, Amer. gen.).—Hering 1941a: 124 (in key, Peruvian gen.); 141 (rev., Peruvian species).—Aczél 1949a: 239 (in neotrop. cat.).—Azcél 1951: 257 (in key, genera of Trypetini).—Aczél 1954a: 75 (taxon., key to neotrop. species).—Bush 1966: 431 (rev., No. Amer. and north. Mex.).—Foote 1967: 57.40 (in neotrop. cat.).

Diagnosis.—Frons somewhat swollen in lateral view, distinctly haired; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars well developed; distinct facial carina present; antenna shorter than face, 3d segment usually pointed dorsoapically but rounded apically in a few species, arista bare; dorsocentrals anywhere between transverse lines through supra-alars and postalars but typically closer to former; 2 pairs scutellars; wing hyaline with narrow to broad, distinct transverse brown bands; vein r–m close to middle of discal cell; vein R4+5 bare.

Discussion.—*Rhagoletis*, economically one of the most important tephritid genera, is widely distributed over the Palaearctic and Nearctic Regions. Twenty-one named species occur in Mexico, West Indies, and throughout most of South America; Foote (in press) has revised the species that occur south of the United States. Its closest relatives are *Zonosemata* Benjamin and *Rhagoletotrypeta* Aczél in the New World, and several palaearctic genera also closely resemble it. Bush (*1966*) provided detailed information on a wide variety of subjects concerning the nearctic members of the genus in his excellent revision.

The genus appears in two separate places in the key because a few species possess an apically rounded rather than pointed third antennal segment.

Genus *Rhagoletotrypeta* Aczél

(Fig. 104)

Rhagoletotrypeta Aczél 1950: 313. Type-species, *xanthogastra* Aczél (orig. desig.).—Aczél 1951: 256 (in key, genera of Trypetini).—Aczél 1954b: 138 (discussion, desc.).—Foote 1966: 803 (rev.).—Foote 1967: 57.41 (in neotrop. cat.).

Serpentinographa Aczél 1950: 308. Type-species, *argentinensis* Aczél (orig. desig.).—Aczél 1951: 256 (in key to genera of Trypetini).

Chaetorhagoletis Blanchard, in Aczél 1954b: 138. Nomen nudum.

Diagnosis.—Frons somewhat swollen in lateral view, distinctly haired; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars well developed; distinct facial carina present; antenna shorter than face, 3d segment rounded apically, arista bare; dorsocentrals between transverse lines through supra-alars and postalars; scutum with narrow yellow wedge-shaped longitudinal mark; 2 pairs scutellars; wing hyaline with dark transverse bands; vein r–m rather close to middle of discal cell; vein R4+5 bare.

Discussion.—Species of this strictly New World genus are rarely seen. Three of the known species were described originally from Argentina, one from Mexico, and one (apparently introduced) from the Eastern United States. No records of the South American species have appeared subsequent to their original descriptions during the early 1950's except a single unidentified specimen in poor condition from Uruguay that was seen during this study. Foote (*1966*) keyed and discussed the known species.

Genus *Rhithrum* Hendel

(Fig. 105)

Rhithrum Hendel 1914b: 85 (1914c: 45). Type-species, *rivulatum* Hendel (orig. desig.).—Hering 1941a: 125 (in key to Peruvian gen.).—Aczél 1949a: 253 (in neotrop. cat.).—Aczél 1953a: 148 (in key, Tephritinae); 175 (rev.).—Foote 1967: 57.42 (in neotrop. cat.).

Diagnosis.—In profile, frons and face meeting at about 90°; frons bare; 2 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, posterior pair light colored; scutum subshining; 1 pair dorsocentrals, rather close to suture; posterior notopleural pair light colored; 2 pairs anepisternals; 2 pairs scutellars, posterior pair less than 0.5 times as long as anterior; hyaline of wing disk about one-half covered by brown banding and other marks, apical half of cell R5 almost entirely hyaline; veins R2+3 and R4+5 gently curved, latter bare; bulla absent.

Discussion.—The two species of this genus, known only from Peru, Bolivia, and Argentina, are rarely obtained in general collecting. The genus can be recognized among the Aciurini by the extensive hyaline area in the apical half of cell R5, but its position in the key may not reflect its true affinities. See Aczél (*1953a*) for detailed information.

Genus *Stoneola* Hering

(Fig. 106)

Stoneola Hering 1941a: 123. Type-species, *Anastrepha fuscobasalis* Hering (orig. desig.).—Stone 1942: 10 (taxon. note).—Aczél 1949a: 236 (in neotrop. cat.).—Aczél 1951: 254 (in key to genera of Trypetini).—Foote 1967: 57.42 (in neotrop. cat.).

Diagnosis.—Three pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; facial carina present; antenna shorter than face, 3d segment rounded apically, arista bare; 1 pair dorsocentrals in transverse line through supra-alars or somewhat behind that line; acrostichals present; 2 pairs scutellars; wing hyaline with pale brown bands slightly resembling those of *Anastrepha*; vein r–m at or rather close to middle of discal cell; vein R4+5 haired; posterior extension of basal cubital cell rather long.

Discussion.—The type-species, previously known only from Peru, was found during this study in Argentina. It is a rather large yellow fly with a very distinctive wing pattern somewhat resembling that of *Anastrepha* but with major differences; moreover, the apex of vein R4+5 is not turned anteriorly as in the latter genus. *S. fuscobasalis* is still the only known member.

Genus *Strobelia* Rondani

(Fig. 107)

Strobelia Rondani 1868: 29. Type-species, *baccharidis* Rondani (Hendel 1914b: 93).—Hendel 1914b: 93 (in key to world gen.).—Hendel 1914c: 50 (rev.).—Hering 1941a: 124 (in key to Peruvian gen.).—Aczél 1949a: 261 (in neotrop. cat.).—Foote 1967: 57.42 (in neotrop. cat.).

Diagnosis.—Frons shining, bare; 2 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, posterior one light; face shining, spotted; parafacial spot present; 1 pair dorsocentrals, between transverse lines between supra-alars and postalars; 2 pairs scutellars, posterior pair more than 0.5 times anterior; wing relatively narrow, disk brown with numerous hyaline or lighter brown spots to posterior margin, which is rounded; vein R2+3 rather sinuate; vein R4+5 haired; bulla absent.

Discussion.—The seven species currently placed in *Strobelia* were described before 1929 and have been known since then only from Peru south to Brazil. In this study an apparently undescribed species was seen from Mexico, leading one to believe the genus may prove to be more widely distributed than previously thought. It is closely related to, and closely resembles, *Rhachiptera* Bigot, from which it may be separated by the key characters (but see discussion of *Rhachiptera*). The species have not been keyed or treated taxonomically in a single publication.

Genus *Tephritis* Latreille

(Figs. 109–111)

Tephritis Latreille 1804: 196. Type-species, *Musca arnicae* Linnaeus (Cresson 1914: 278).—Wulp 1900: 419 (part) (discussion, Mex. species).—Hendel 1914b: 90 (in key, world gen.).—Hendel 1914c: 31 (part) (in key, So. Amer. gen.).—Cresson 1931: 3 (taxon. discussion).—Curran 1934b: 291 (in key, Amer. gen.).—Hering 1941a: 126 (in key, Peruvian gen.).—Hering 1944b: 17 (key to species, world).—Hering 1947a: 7 (taxon. discussion).—Aczél 1949a: 296 (part) (in neotrop. cat.).—Foote 1960a: 71 (diagnosis, comparison with other gen.).—Foote 1967: 57.43 (in neotrop. cat.).

Trypanea (*Tephritis*) Group II (part), Malloch 1933: 278 (key to species, Chile).

Diagnosis.—In profile, face and frons meeting at distinct angle of 90°–120°; frons bare; 2 pairs lower fronto-orbitals; 2 pairs scutellars, posterior pair longer than 0.5 times anterior pair; hind tibia usually with row of short, delicate setae; wing relatively narrow, dark with hyaline areas discrete and usually covering up to ½ of disk, usually with solid dark area immediately posterior to subcostal cell; vein R4+5 bare or with few setae at extreme base; bulla absent.

Discussion.—The genus *Tephritis*, with over 75 described species, is found in nearly all the zoogeographical regions of the world and occurs in Mexico, Peru, Chile, and Argentina. Since specimens are fairly common in collections, it is rather surprising to find that this genus has not been found from a number of South American countries in my study material.

The species are most readily recognized by the wing pattern, which usually has an unmarked dark area extending posteriorly from the subcostal cell. A few species, however, possess wings more closely resembling those of *Trupanea*, and I have seen other specimens with an intermediate pattern as well.

I have diagnosed the genus and discussed the North American species (Foote *1960a*). Hering (*1944b*) presented a key to nearly all the described species of the world.

Genus *Tetreuaresta* Hendel

(Fig. 112)

Tetreuaresta Hendel 1928: 368. Type-species, *Trypeta obscuriventris* Loew (orig. desig.).—Curran 1931: 14 (discussion, in key to genera of Puerto Rico and Virgin Isl.).—Bates 1933: 53 (brief desc.).—Bates 1934: 8, 15 (taxon. notes).—Curran 1934b: 291 (in key, Amer. gen.).—Hering 1941a: 125 (in key, Peruvian gen.); 154 (rev.).—Aczél 1949a: 276 (in neotrop. cat.).—Foote 1967: 57.43 (in neotrop. cat.).—Steyskal 1972b: 403 (key to known species).

Diagnosis.—In profile, head higher than long, face and frons meeting in continuous curve; frons bare; 3 or more pairs lower fronto-orbitals; both pairs notopleurals usually dark; katepisternals and anepimerals dark; 2 pairs scutellars, posterior pair of varying length; wing usually broad, dark with distinctly bordered hyaline spots; vein R4+5 prominently haired; bulla usually absent.

Discussion.—Species of *Tetreuaresta* are rather easily identified by the oval head, dark broad wing with discrete hyaline spots and vein R4+5 haired, and three or more pairs of lower fronto-orbitals. A large number of described species occur from Mexico south to southern Brazil. They have never been critically studied as a group, but Steyskal (*1972b*) presented a useful key to all the described species, which are restricted to the New World.

Genus *Tomoplagia* Coquillett

(Fig. 113)

Plagiotoma Loew 1873: 252 (preoccupied Dujardin 1841). Type-species, *Trypeta obliqua* Say (Coquillett 1910: 591).—Wulp 1899: 405 (*obliqua* (Say) treated).—Lutz and Lima 1918: 9 (key to species).—Curran 1931: 14 (in key, Puerto Rican and Virgin Isl. gen.).

Tomoplagia Coquillett 1910: 591, 615 (new name for *Plagiotoma* Loew). Type-species, *Trypeta obliqua* Say (automatic).—Hendel 1914b: 88 (in key, world gen.).—Hendel 1914c: 33 (in key, So. Amer. gen.).—Benjamin 1934: 32 (desc., discussion of Fla. species).—Curran 1934b: 291 (in key, Amer. gen.).—Hering 1941a: 124 (in key, Peruvian gen.); 143 (desc., discussion of species).—Aczél 1949a: 241 (in neotrop. cat.).—Aczél 1951: 255 (in key, genera of Trypetini).—Aczél 1955a: 321 (rev.).—Aczél 1955b: 139 (comparative morphol. of species).—Foote 1967: 57.45 (in neotrop. cat.).

Plagiostoma, error.

Diagnosis.—Small to medium-sized yellowish flies with few black spots on thorax and abdomen and wings with characteristically diagonal bands; frons swollen in lateral view, bare; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars well developed; face matte, without carina; antenna shorter than face, 3d segment rounded apically, arista bare; 1 pair dorsocentrals, between suture and transverse line through supra-alars, commonly closer to former than to latter; acrostichals present; 2 pairs scutellars; vein r-m apicad of middle of discal cell; vein R4+5 bare; posterior extension of basal cubital cell rather long.

Discussion.—Specimens seen in this study from Trinidad, Venezuela, and Chile leave only Uruguay and the three "Guianas" as not being represented in the distribution of this extremely widespread New World genus. Two species are known from the United States, one widespread and one from the Western States, and 44 additional ones are known south of Texas and Florida. The wings of almost all the species are distinctive in that three to four prominent yellow-to-dark-brown bands obliquely occupy most of the disk. Aczél's (*1955a*) revision makes possible their satisfactory identification, and his morphological study of the genus (*1955b*) is one of the most complete in scope and size that I have seen on the Tephritidae.

Genus *Toxotrypana* Gerstäcker

(Fig. 114)

Toxotrypana Gerstäcker 1860: 191. Type-species, *curvicauda* Gerstäcker (monotypy).—Hendel 1914b: 74 (in key, world gen.).—Hendel 1914c: 10 (in key, So. Amer. gen.).—Curran 1931: 14 (in key, genera of Puerto Rico and Virgin Isl.).—Benjamin 1934: 10 (diagnosis).—Curran 1934b: 293 (in key, Amer. gen.).—Hering 1941a: 123 (in key, Peruvian gen.); 126 (discussion).—Aczél 1949a: 180 (in neotrop. cat.).—Aczél 1952a: 123 (in neotrop. cat.).—Blanchard 1959: 33 (rev.).—Foote 1967: 57.48 (in neotrop. cat.).

Mikimyia Bigot 1884: xxix. Type-species, *furcifera* Bigot (monotypy) = *curvicauda* Gerstäcker.

Toxotrypanea, error or emendation.

Diagnosis.—Large brownish flies, female with greatly elongated, downwardly curved ovipositor sheath, abdomen of both sexes relatively long, constricted at base; lower fronto-orbitals absent; antenna distinctly longer than face, arista distinctly haired; ocellars short, fine, hairlike; scutellum shining, scutellars situated apicad of middle of scutellum; wing long and narrow, hyaline, with broad, light-brown costal band; vein R2+3 distinctly sinuate, with at least 1 small, anteriorly directed, accessory vein; vein R4+5 straight; basal M cell and basal cubital cell about equal in width.

Discussion.—This distinctive genus, which is restricted to the New World, is easily recognized by the characters in the diagnosis and key. The taxonomy and biology of *T. curvicauda* in the Southern United States, Mexico, and the West Indies are discussed in several reports. Blanchard (*1959*) revised the genus, described six new species from Argentina and Brazil (the only ones added to the genus subsequent to its original description), and keyed the known species of the Neotropical Region.

Genus *Trupanea* Schrank

(Fig. 115)

Trupanea Guettard 1762: 170–173. Unavailable name (author not binominal).

Trupanea Schrank 1795: 147. Type-species, *radiata* Schrank (monotypy) = *stellata* (Fuessley).—Curran 1928: 70 (in key, Puerto Rican gen.).—Curran 1931: 14 (in key, Puerto Rican and Virgin Isl. gen.).—Curran 1934b: 293 (in key, Amer. gen.).—Aczél 1949a: 298 (in neotrop. cat.).—Aczél 1953c: 273 (rev., Argentina group).—Foote 1960: 1 (rev., U.S. species).—Munro 1964: 1 (rev., African species).—Foote 1967: 57.48 (in neotrop. cat.).

Trypanea, emendation.

Trypanea (*Trypanea*) Groups III, IV, VI, and VII (part), Malloch 1933: 282, 284, 290, 292 (desc., keys to Chilean species).

Urellia Robineau-Desvoidy 1830: 774. Type-species, *calcitrapae* Robineau-Desvoidy (Coquillett 1910: 618) = *stellata* (Fuessley).—Wulp 1900: 426 (desc., Mex. species).—Brèthes 1908: 367 (key to species, Argentina).

Diagnosis.—In profile, face and frons meeting at distinct angle of about 90°; frons bare; 3 pairs lower fronto-orbitals in all but a very few species that possess only 2 pairs; 1 pair rather long scutellars; tibiae without rows of setae; wing pattern very characteristic, having dark area at center of wing from which narrow bands reach to anterior, apical, and posterior margins, and sometimes other dark marks basally; vein R4+5 bare; bulla absent.

Discussion.—The genus *Trupanea*, with over 100 described species, occurs in all the major geographic regions of the world and is found, or will prove to be found, in every country in the region under study here. Most of the species can be recognized by the wing pattern, which has a characteristic dark preapical stellate mark with narrow dark rays attaining the anterior, apical, and posterior wing margins, and by the three pairs of lower fronto-orbitals and one pair of scutellars. The genus appears twice in the key to accommodate a few specimens that appear to have only two pairs of lower fronto-orbitals, or in which vein R4+5 is haired. None of the neotropical species has been keyed for the region, but Foote (*1960e*) presented a key to the nearctic fauna and Foote and Blanc (*1963*) a key to the California species.

Genus *Trypanaresta* Hering

(Fig. 116)

Trypanaresta Hering 1940a: 10. Type-species, *imitatrix* Hering (orig. desig.).—Hering 1941a: 125 (in key, Peruvian gen.); 156 (rev.).—Aczél 1949a; 293 (in neotrop. cat.).—Foote 1967: 57.53 (in neotrop. cat.).

Trypanea (*Tephritis*), Group II (part) of Malloch 1933: 278 (desc. of species).

Diagnosis.—In profile, frons and face meeting at angle of about 120°; frons distinctly haired; 2 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; posterior notopleural light colored; katepisternals and anepimerals concolorously dark; 2 pairs scutellars, posterior pair shorter than 0.5 times anterior; wing with rather typical *Trupanea* pattern but with yellowish or darker markings proximally in addition; subcostal cell entirely dark; bulla absent or present.

Discussion.—At first glance, species of *Trypanaresta* are similar to those species of *Euarestoides* having the proximal half of the wing yellowish. In some species, the dark fascia from the subcostal cell to the starlike mark may be missing, but if so, the yellow area has a sharp margin apically. The starlike mark can be yellow rather than black, but in that event, a black spot or bulla is present centrally in it.

Hering's original description of the type-species and subsequent study of its congeners leave little doubt that *Trypanaresta* is distinct; the presence of only two lower fronto-orbitals is additional supporting evidence. Hering (*1940a*) published a key to some of the neotropical species.

Genus *Trypeta* Meigen

(Figs. 33, 117)

Trypeta Meigen 1803: 277. Type-species, *Musca artemisiae* Fabricius (Coquillett 1910: 618).—Cresson 1914: 276 (nomencl., taxon. comment).—Curran 1934b: 289 (in key, Amer. gen.).—Hendel 1935: 53 (taxon. notes).—Foote 1960f: 253 (rev. No. Amer. species).—Foote 1967: 57.53 (in neotrop. cat.).

Forelia Robineau-Desvoidy 1830: 760. Type-species, *onopordi* Robineau-Desvoidy (Rondani 1870: 7) = *artemisiae* (Fabricius).

Phorellia, emendation; Aczél 1949a: 250 (in neotrop. cat.).

Spilographa Loew 1862b: 39. Type-species, *Trypeta hamifera* Loew (Coquillett 1910: 607).—Wulp 1899: 406 (in key, Mex. species).
Siplographa, error.
Euribia, authors, not Meigen.

Diagnosis.—Medium-sized flies with brownish or yellowish body and hyaline wing with either complete or partial S-shaped band or isolated brown spots; vertex rounded in lateral view; frons swollen in lateral view, haired; face matte, with distinct carina; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars well developed; 3d antennal segment shorter than face, 3d segment rounded apically, arista bare; 1 pair dorsocentrals, situated from slightly ahead to slightly behind transverse line through supra-alars; 2 pairs scutellars; vein r–m at about middle of discal cell; vein R4+5 bare.

Discussion.—The genus *Trypeta* has been recogized under a wide variety of generic names for about 200 years in Europe, where numerous species abound on a variety of hosts. It is apparently holarctic, with seven species described from the United States and Canada (Foote *1960f*) and three from Mexico (Wulp *1899*). Additional Mexican material, unidentified to species, was seen in this study, indicating that the genus does not extend much farther south. Species of New World *Trypeta* are not easily recognized except for the banded or spotted wing and the more or less receding face. Suspect specimens should be examined carefully when using the key and diagnostic characters.

Genus *Urophora* Robineau-Desvoidy

(Fig. 118)

Euribia Meigen 1800: 36. Type-species, *Musca cardui* Linnaeus (Hendel 1927: 41). Suppressed by Internatl. Comn. Zool. Nomencl. 1963: 339.—Hendel 1914b: 96 (in key, world gen.).—Hendel 1914c: 66 (in key, So. Amer. gen.).—Hering 1941a: 127 (in key, Peruvian species).—Aczél 1949a: 182 (part) (in neotrop. cat.).
Urophora Robineau-Desvoidy 1830: 769. Type-species, *sonchi* Robineau-Desvoidy (Westwood 1840: 149) = *cardui* (Linnaeus).—Bezzi 1923: 1 (desc.; key, Amer. species).—Foote 1967: 57.54 (in neotrop. cat.).

Diagnosis.—See diagnosis of subfamily.

Discussion.—The species of this genus, occurring in all the zoogeographical regions of the world, have a wide distribution in the New World from the United States to Brazil. Five known species, including at least 1 introduced from Europe for the biological control of weeds, occur in the Western United States and 16 additional ones are known to the south. There are a number of undescribed species, as the genus occurs rather frequently in general collecting and there has been no recent taxonomic investigation.

In the New World, no other genus of Tephritidae lacks completely an extension of the basal cubital cell. However, in some tephritines this extension is so short as to be nearly undetectable, but the additional characters in the key will enable one to recognize the species of this genus.

Genus *Xanthaciura* Hendel

(Fig. 119)

Xanthaciura Hendel 1914b: 86 (1914c: 45). Type-species, *Trypeta chrysura* Thomson (orig. desig.).—Bates 1933: 55 (desc.).—Malloch 1933: 266 (rev.).—Benjamin 1934: 43 (diagnosis, discussion).—Curran 1934b: 293 (in key, Amer. gen.).—Hering 1941a: 124 (in key, Peruvian gen.); 147 (rev., Peruvian species).—Aczél 1949a: 253 (in neotrop. cat.).—Aczél 1949b: 111 (rev.).—Aczél 1952c: 245 (morphol., further rev.).—Aczél 1953a: 148 (in key, genera of Group I Tephritinae); 184 (taxon. discussion).—Foote 1967: 57.54 (in neotrop. cat.).
Tetraciura Hendel 1914b: 90 (1914c: 48). Type-species, *quadrisetosa* Hendel (orig. desig.; as *quadriseta*, error).
Aciura, subgenus *Eucosmoptera* Phillips 1923: 131. Type-species, *Aciura tetraspina* Phillips (Bates 1933: 55).
Aciura Robineau-Desvoidy of Curran 1928: 70; Curran 1931: 14; and other authors.

Diagnosis.—In profile, frons and face meeting in curve rather than angle; frons narrow, bare; 3 pairs lower fronto-orbitals; 1 pair upper fronto-orbitals; postoculars expanded, light colored; scutum shining to subshining, usually black; 1 or 2 pairs dorsocentrals, if only 1 pair, it is close to suture; notopleurals concolorously dark; 1 pair anepisternals; 1 pair scutellars; characteristically dark wing with 2 inverted hyaline triangles in cell R1 immediately apicad of subcostal cell, cell R3 entirely dark except sometimes tips of these triangles, and 2 or more hyaline incisions

along posterior border of wing; vein R2+3 sometimes rather sinuate; vein R4+5 bare; bulla absent.

Discussion.—This is a very distinctive New World genus. Three species occur in the southern half of the United States, Mexico, and the West Indies, and 13 are found throughout the Neotropical Region south to and including Brazil. The genus is common in general collecting, and the wing patterns of nearly all the species are similar, appearing as in figure 119. Aczél (*1949b, 1952c, 1953a*) keyed and reviewed most of the neotropical species.

Genus *Xenochaeta* Snow

(Figs. 16, 120)

Xenochaeta Snow 1894: 166. Type-species, *dichromata* Snow (monotypy).—Hendel 1914c: 6 (in key to neotrop. gen.).—Curran 1934b: 287 (in key, Amer. gen.).—Foote 1960d: 107 (taxon. discussion).

Diagnosis.—In profile, frons and face meeting at about 90°; frons very wide, haired; 3 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals, unicolorously dark, uppers mesad of lowers, anterior upper pair anterior to posterior lower pair; postoculars expanded, light colored; antenna shorter than face, 3d segment with short, dorsoapical spine; 1 pair dorsocentrals, in transverse line through supra-alars; posterior pair of notopleurals light colored; 2 pairs anepisternals; scutellum swollen, shining; 2 pairs scutellars, posterior pair more than 0.5 times as long as anterior; wing dark with scattered hyaline spots; vein r–m angular; veins R2+3 and R4+5 gently curved, latter haired only at base; bulla absent; abdominal tergum with long, light-colored setae.

Discussion.—Prior to this study this genus was known only by its two described species from the Western United States. I have recently seen an undescribed male from Chihuahua, Mexico, the first record of the genus south of the United States. The species are rarely found in general collecting but usually can be recognized by the presence of a short, stout spine at the dorsal apex of the third antennal segment (fig. 16) in combination with the extremely wide frons and the yellowish abdomen with prominent dark spots.

Genus *Zonosemata* Benjamin

(Figs. 14, 121)

Zonosemata Benjamin 1934: 17. Type-species, *Trypeta electa* Say (orig. desig.).—Curran 1934b: 289 (in key, Amer. gen.).—Aczél 1951: 257 (taxon. discussion).—Aczél 1954b: 152 (taxon. comments).—Bush 1965: 307 (rev.).—Foote 1967: 57.56 (in neotrop. cat.).
Zonosema Loew of authors.
Phorellia Hendel (part).
Spilographa Loew (part).

Diagnosis.—Frons somewhat swollen in lateral view, haired; 3–4 pairs lower fronto-orbitals; 2 pairs upper fronto-orbitals; ocellars well developed; distinct facial carina present; antenna shorter than face, 3d segment pointed dorsoapically, arista bare; dorsocentrals distinctly behind transverse line through supra-alars; acrostichals present; 2 pairs scutellars; notum and pleurae yellow, brown, and black; wing disk with S-shaped band, in costal opening of which is small brown mark; vein r–m rather close to middle of discal cell; vein R4+5 bare.

Discussion.—This New World genus is closely related to *Rhagoletis* Loew, *Rhagoletotrypeta* Aczél, *Oedicarena* Loew, and, according to Bush (*1965*), to the palaearctic genus *Carpomyia* Rondani. As far as is known, its hosts are solanaceous plants. The genus is distinctive and is readily identified by use of the key characters. Bush (*1965*) keyed the species known from the United States, Mexico, and Jamaica, but specimens, possibly undescribed, from Central America and Colombia have been seen in this study.

LITERATURE CITED

ANONYMOUS.
1975. MEDITERRANEAN FRUIT FLY IN THE U.S. – 1975. U.S. Dept. Agr. Coop. Econ. Insect Rpt. 25 (43): 835–839, illus.

ACZÉL, M.
1949a. CATALOGO DE LA FAMILIA "TRYPETIDAE" DE LA REGION NEOTROPICAL. Acta Zool. Lilloana 7: 177–328, illus.

ACZÉL, M.
1949b. THE GENUS "XANTHACIURA" BASED ON ARGENTINE SPECIES. Acta Zool. Lilloana 8: 111–146, illus.

1950. GENEROS Y ESPECIES DE LA TRIBU "TRYPETINI." I. DOS GENEROS Y TRES ESPECIES NUEVOS DE LA ARGENTINA. Acta Zool. Lilloana 9: 307–323, illus.

1951. GENEROS Y ESPECIES NEOTROPICALES DE LA TRIBUS "TRYPETINI." II. DOS GENEROS Y UNA ESPECIE NUEVOS. Acta Zool. Lilloana 12: 253–278, illus.

1952a. SUPLEMENTO AL "CATALOGO DE LA FAMILIA TRYPETIDAE DE LA REGION NEOTROPICAL." Acta Zool. Lilloana 12 (1951): 117–133, illus.

1952b. REVISION PARCIAL DEL GENERO AMERICANO PARACANTHA COQUILLETT. Acta Zool. Lilloana 10: 199–243, illus.

1952c. FURTHER REVISION OF THE GENUS XANTHACIURA HENDEL. Acta Zool. Lilloana 10: 245–280, illus.

1952d. EL GENERO EUARESTA LOEW (=CAMAROMYIA HENDEL) EN LA REGION NEOTROPICAL. Rev. Chilena Ent. 2: 147–172, illus.

1953a. LA FAMILIA TEPHRITIDAE EN LA REGION NEOTROPICAL. I. Acta Zool. Lilloana 13: 97–200, illus.

1953b. THE GENUS TRUPANEA SCHRANK IN THE NEOTROPICAL REGION. 1. THE DIESPASMENA GROUP. Dusenia 4: 273–286, illus.

1953c. THE GENUS TRUPANEA IN THE NEOTROPICAL REGION. 2. THE ARGENTINA GROUP. Dusenia 4: 365–387, illus.

1954a. GENEROS Y ESPECIES DE LA TRIBUS "TRYPETINI." 3. SOBRE LOS GENEROS RHAGOLETIS, "PHORELLIA," Y TOMOPLAGIODES. Dusenia 5: 71–94, illus.

1954b. GENEROS Y ESPECIES DE LA TRIBUS TRYPETINI. 4. EL GENERO RHAGOLETOTRYPETA Y NUEVAS ESPECIES DE TOMOPLAGIA Y ZONOSEMATA. Dusenia 5: 137–164, illus.

1955a. FRUIT FLIES OF THE GENUS TOMOPLAGIA COQUILLETT. U.S. Natl. Mus. Proc. 104 (No. 3343): 321–411, illus.

1955b. THE COMPARATIVE MORPHOLOGY OF THE TOMOPLAGIA COQUILLETT SPECIES. Dusenia 6: 139–170, illus.

1955c. THE GENUS PARASTENOPA HENDEL. Wasmann Jour. Biol. 13: 167–187, illus.

1958. REVISION OF THE AMERICAN SPECIES OF THE GENUS ACINIA ROBINEAU-DESVOIDY. Rev. Brasil. de Ent. 8: 75–106, illus.

ALDRICH, J. M.
1925. NEW DIPTERA OR TWO-WINGED FLIES IN THE UNITED STATES NATIONAL MUSEUM. U.S. Natl. Mus. Proc. 66 (Art. 18): 1–36, illus.

1929. A REVISION OF THE TWO-WINGED FLIES OF THE GENUS PROCECIDOCHARES IN NORTH AMERICA WITH AN ALLIED NEW GENUS. U.S. Natl. Mus. Proc. 76 (Art. 2): 1–13, illus.

BAKER, A. C., STONE, W. E., PLUMMER, C. C., and MCPHAIL, M.
1944. A REVIEW OF STUDIES ON THE MEXICAN FRUIT-FLY AND RELATED MEXICAN SPECIES. U.S. Dept. Agr. Misc. Pub. 531, 155 pp., illus.

BATES, M.
1933. NOTES ON AMERICAN TRYPETIDAE II. Psyche 40: 48–56, illus.

1934. NOTES ON AMERICAN TRYPETIDAE IV. ACROTAENIA AND SIMILAR GENERA. Rev. de Ent. 4: 1–17, illus.

1935. NOTES ON AMERICAN TRYPETIDAE (DIPTERA) III. THE GENUS TEPHRELLA. Pan-Pacific Ent. 11: 103–114, illus.

BECKER, T.
1919. DIPTERES, BRACHYCERES. Mission du Serv. Géog. de l'Armée Mesure d'un Arc Méridien Equatorial en Amer. du Sud 10 (2): 163–214, illus.

BENJAMIN, F. H.
1934. DESCRIPTIONS OF SOME NATIVE TRYPETID FLIES WITH NOTES ON THEIR HABITS. U.S. Dept. Agr. Tech. Bul. 401, 95 pp., illus.

BEZZI, M.
1909. LE SPECIE DEI GENERI CERATITIS, ANASTREPHA E DACUS. Portici R. Scuola Super. di Agr., Lab. Zool. Gen. e Agr. Bol. 3: 273–313, illus.

1910. RESTAURAZIONE DEL GENERE CARPOMYIA (ROND.) A. COSTA. Portici R. Scuola Super. di Agr., Lab. Zool. Gen. e Agr. Bol. 5: 1–32, illus.

1923. THE GENUS UROPHORA ROBINEAU-DESVOIDY IN AMERICA. Amer. Ent. Soc. Trans. 49: 1–6, illus.

——— and TAVARES, A. S.
1916. ALGUNS MUSCIDEOS CECIDOGENICOS DO BRASIL. Brotéria, Sér. Zool. 14: 155–170, illus.

BIGOT, J.
1859. DIPTERORUM ALIQUOT NOVA GENERA. Rev. et Mag. de Zool., No. 7, pp. 305–315, illus.

———
1884. (DESCRIPTION D'UN NOUVEAU GENRE ET D'UN NOUVELLE ESPECE DE DIPTERES DE LA FAMILLE DES ORTALIDAE.) Soc. Ent. de France Ann., ser. 6, 4 (Bul.): xxix–xxx.

———
1889a. NOVUM GENUS DIPTERORUM, EX TRYPETIDIS, GENUS CHAETOSTOMAE (RONDANI) SAT VICINUM. Soc. Ent. de France Bul. (1889): xxix–xxx.

———
1889b. (CHANGE OF GENERIC NAME). Soc. Ent. de France Ann., ser. 6, 9 (Bul.): xciii.

BLANC, F. L., and FOOTE, R. H.
1961. A NEW GENUS AND FIVE NEW SPECIES OF CALIFORNIA TEPHRITIDAE. Pan-Pacific Ent. 37: 73–83, illus.

BLANCHARD, E. E.
1929. DESCRIPTIONS OF ARGENTINE DIPTERA. Physis 9: 458–465, illus.

———
1959. EL GENERO "TOXOTRYPANA" EN LA REPUBLICA ARGENTINE. Acta Zool. Lilloana 17: 33–44, illus.

BRETHES, J.
1908. EL GENERO URELLIA (DIPTERA) EN LA PLATA. Buenos Aires Mus. Nac. Ann. 16: 367–374, illus.

———
1916. DESCRIPTION D'UN NOUVEAU GENRE ET D'UN NOUVELLE ESPECE D'ORTALIDAE DU CHILE. An. de Zool. Aplicada 3: 12–13, illus.

BUSH, G. L.
1962. THE CYTOTAXONOMY OF THE LARVAE OF SOME MEXICAN FRUIT FLIES IN THE GENUS ANASTREPHA. Psyche 69: 87–101, illus.

———
1965. THE GENUS ZONOSEMATA, WITH NOTES ON THE CYTOLOGY OF TWO SPECIES. Psyche 72: 307–323, illus.

———
1966. THE TAXONOMY, CYTOLOGY AND EVOLUTION OF THE GENUS RHAGOLETIS IN NORTH AMERICA (DIPTERA: TEPHRITIDAE). Harvard Univ. Mus. Compar. Zool. Bul. 134 (11): 431–562, illus.

——— and HUETTEL, M. D.
1970. CYTOGENETICS AND DESCRIPTION OF A NEW NORTH AMERICAN SPECIES OF THE NEOTROPICAL GENUS CECIDOCHARELLA (DIPTERA: TEPHRITIDAE). Ent. Soc. Amer. Ann. 63: 88–91, illus.

COLE, F. R.
1923. DIPTERA FROM THE ISLANDS AND ADJACENT SHORES OF THE GULF OF CALIFORNIA. II, GENERAL REPORT. Calif. Acad. Sci. Proc., ser. 4, 12: 457–481, illus.

COQUILLETT, D. W.
1899. NOTES AND DESCRIPTIONS OF TRYPETIDAE. N.Y. Ent. Soc. Jour. 7: 259–268.

———
1910. THE TYPE-SPECIES OF THE NORTH AMERICAN GENERA OF DIPTERA. U.S. Natl. Mus. Proc. 37: 499–647.

CRESSON, E. T., JR.
1914. SOME NOMENCLATORIAL NOTES ON THE DIPTEROUS FAMILY TRYPETIDAE. Ent. News 25: 275–279.

———
1929. A REVISION OF THE NORTH AMERICAN SPECIES OF FRUIT FLIES OF THE GENUS RHAGOLETIS (DIPTERA; TRYPETIDAE). Amer. Ent. Soc. Trans. 55: 401–414, illus.

———
1931. NOTES ON THE ABSTERSA GROUP OF THE GENUS TEPHRITIS, AND A DESCRIPTION OF A NEW SPECIES FROM CALIFORNIA (DIPTERA: TRYPETIDAE). Ent. News 42: 3–5.

CURRAN, C. H.
1928. DIPTERA, OR TWO-WINGED FLIES. Porto Rico, Virgin Isl., Sci. Survey, v. 11, pt. 1, Insects. 118 pp., illus. N.Y. Acad. Sci.

———
1931. FIRST SUPPLEMENT TO THE 'DIPTERA OF PORTO RICO AND THE VIRGIN ISLANDS.' Amer. Mus. Nat. Hist., Amer. Mus. Novitates 456: 1–23, illus.

———
1932. NEW SPECIES OF TRYPANEIDAE, WITH KEY TO THE NORTH AMERICAN GENERA. Amer. Mus. Nat. Hist., Amer. Mus. Novitates 556: 1–19, illus.

———
1934a. THE DIPTERA OF KARTABO, BARTICA DISTRICT, BRITISH GUIANA, WITH DESCRIPTIONS OF NEW SPECIES FROM OTHER BRITISH GUIANA LOCALITIES. Amer. Mus. Nat. Hist. Bul. 66: 287–532, illus.

———
1934b. THE FAMILIES AND GENERA OF NORTH AMERICAN DIPTERA 512 pp. Ballou Press, New York. (Rev. 1964.)

FABRICIUS, J. C.
1805. SYSTEMA ANTLIATORUM SECUNDUM ORDINES, GENERA, SPECIES. 373 pp. Brunswick, Germany.

FOOTE, R. H.
1958. THE GENUS EUARESTOIDES IN THE UNITED STATES AND MEXICO. Ent. Soc. Amer. Ann. 51: 288–293, illus.

———
1960a. THE GENUS TEPHRITIS LATREILLE IN THE NEARCTIC REGION NORTH OF MEXICO: DESCRIPTIONS OF FOUR NEW SPECIES AND NOTES ON OTHERS. Kans. Ent. Soc. Jour. 33: 71–85, illus.

———
1960b. THE TEPHRITIDAE AND OTITIDAE OF THE BAHAMA ISLANDS. N.Y. Ent. Soc. Jour. 68: 83–99, illus.

FOOTE, R. H.
1960c. A NEW TEPHRITID GENUS, RHAGOLETOIDES, WITH NOTES ON ITS DISTRIBUTION AND SYSTEMATIC POSITION. Ent. News 71: 145–149, illus.

———
1960d. NOTES ON SOME NORTH AMERICAN TEPHRITIDAE, WITH DESCRIPTIONS OF TWO NEW GENERA AND TWO NEW SPECIES. Wash. Biol. Soc. Proc. 73: 107–118, illus.

———
1960e. A REVISION OF THE GENUS TRUPANEA IN AMERICA NORTH OF MEXICO. U.S. Dept. Agr. Tech. Bul. 1214, 29 pp., illus.

———
1960f. THE GENUS TRYPETA MEIGEN IN AMERICA NORTH OF MEXICO (DIPTERA, TEPHRITIDAE). Ent. Soc. Amer. Ann. 53: 253–260, illus.

———
1960g. A NEW NORTH AMERICAN FRUIT FLY GENUS, PROCECIDOCHAROIDES (DIPTERA: TEPHRITIDAE). Ent. Soc. Amer. Ann. 53: 671–675, illus.

———
1965a. FAMILY TEPHRITIDAE. *In* Stone, A., et al., eds., A Catalog of the Diptera of America North of Mexico, pp. 658–678. U.S. Dept. Agr. Agr. Handb. 276, Washington, D.C.

———
1965b. A STUDY OF THE TYPES OF TEPHRITIDAE DESCRIBED BY F. M. VAN DER WULP IN "BIOLOGIA CENTRALI AMERICANA." Kans. Ent. Soc. Jour. 38: 236–247.

———
1966. THE GENUS RHAGOLETOTRYPETA, WITH A NEW NEARCTIC SPECIES (DIPTERA: TEPHRITIDAE). Ent. Soc. Amer. Ann. 59: 803–807, illus.

———
1967. FAMILY TEPHRITIDAE. *In* Vanzolini, M., ed., A Catalog of the Diptera of the Americas South of the United States, v. 57, pp. 57.1–57.91. Dept. Zool., Sec. Agr., São Paulo, Brasil.

———
1978. NEW GENERA AND SPECIES OF NEOTROPICAL TEPHRITIDAE (DIPTERA). Wash. Acad. Sci. Jour. 68: 27–32, illus.

——— and BLANC, F. L.
1963. THE FRUIT FLIES OR TEPHRITIDAE OF CALIFORNIA. Calif. Insect Survey Bul. 7, 117 pp., illus.

——— and BLANC, F. L.
1969. NEW SPECIES OF TEPHRITIDAE (DIPTERA) FROM THE WESTERN UNITED STATES, MEXICO, AND GUATEMALA, WITH REVISIONARY NOTES. Pan-Pacific Ent. 55: 161–179.

FREIDBERG, A., and KUGLER, J.
1977. THE TYPE-SPECIES OF GONIURELLIA HENDEL, 1927 (INSECTA; DIPTERA: TEPHRITIDAE) Z.N. (S.) 2157. Internatl. Comn. Zool. Nomencl., Bul. Zool. Nomencl. 33: 208–211, illus.

FREY, R.
1945. TIERGEOGRAPHISCHE STUDIEN UBER DIE DIPTERENFAUNA DER AZOREN. I. VERZEICHNIS DER BISHER VON DEN AZOREN BEKANNTEN DIPTEREN. Finsk. Vetensk. Soc. Comm. Biol. 8 (10): 1–114, illus.

GERSTACKER, A.
1860. BESCHREIBUNG EINIGER AUSGEZEICHTNETEN NEUEN DIPTEREN AUS DER FAMILIE MUSCARIAE. Stettin Ent. Ztg. 21: 163–208, illus.

GIGLIO-TOS, E.
1893. DIAGNOSI DI NUOVI GENERI E DI NOUVE SPECIE DI DITTERI. IX. [Turin Univ.] Mus. Zool. ed. Anat. Compar. Bol. 8 (No. 158): 1–14.

———
1895. DITTERI DEL MESSICO. PARTE IV. MUSCIDAE CALYPTERATAE. MUSCIDAE ACALYPTERATAE. R. Accad. delle Sci. Torino Mem., ser. II, v. 45, 74 pp., illus.

GREENE, C. T.
1934. A REVISION OF THE GENUS ANASTREPHA BASED ON A STUDY OF THE WINGS AND ON THE LENGTH OF THE OVIPOSITOR SHEATH. Wash. Ent. Soc. Proc. 36: 127–179, illus.

GUETTARD, J. E.
1762. OBSERVATIONS QUE PEUVENT SERVIR A FORMER QUELQUES CARACTERES DE COQUILLAGES. [Paris] Acad. Roy. des Sci., Hist. avec Mém. Math. et Phys. Mém. 1756: 145–183.

HARDY, D. E.
1968. THE FRUIT FLY TYPES IN THE NATURHISTORISCHES MUSEUM, WIEN (TEPHRITIDAE-DIPTERA). Wien. Naturhist. Mus. Ann. 72: 107–155, illus.

———
1973. THE FRUIT FLIES (TEPHRITIDAE-DIPTERA) OF THAILAND AND BORDERING COUNTRIES. Pacific Insects Monog. 31, 353 pp., illus.

———
1974. THE FRUIT FLIES OF THE PHILIPPINES (DIPTERA: TEPHRITIDAE). Pacific Insects Monog. 32, 266 pp., illus.

HENDEL, F.
1907. NOMINA NOVA FUR MEHRERE GATTUNGEN DER ACALYPTRATEN MUSCIDEN. Wien. Ent. Ztg. 26: 98.

———
1914a. ANALYTISCHE UBERSICHT UBER DIE ANASTREPHA-ARTEN (DIPT.). Wien. Ent. Ztg. 33: 66–70.

———
1914b. DIE GATTUNGEN DER BOHRFLIEGEN (ANALYTISCHE UBERSICHT ALLER BISHER BEKANNTEN GATTUNGEN DER TEPHRITINAE). Wien. Ent. Ztg. 33: 73–98.

———
1914c. DIE BOHRFLIEGEN SUDAMERIKAS. K. Zool. Anthrop.-Ethnog. Mus. Abhandl. Ber. (1912) 14 (3): 1–84, illus.

1927. TRYPETIDAE. FAMILY 49. *In* Lindner, E., ed., Die Fliegen der Palaearktischen Region, v. 5, 221 pp, illus. Stuttgart.

1928. NEUE ODER WENIGER BEKANNTE BOHRFLIEGEN (TRYPETIDAE) AUS DEM DEUTSCHEN ENTOMOLOGISCHEN INSTITUT BERLIN-DAHLEM. Ent. Mitt. 17: 341–370.

1931. KRITISCHE UND SYNONYMISCHE BEMERKUNGEN UBER DIPTEREN. Zool.-Bot. Gesell. Wien, Verhandl. 81: 4–19.

1935. BEMERKUNGEN ZU "THE FAMILIES AND GENERA OF NORTH AMERICAN DIPTERA" BY C. H. CURRAN, NEW YORK, 1934. Konowia 14: 51–57.

1936. ERGEBNISSE EINER ZOOLOGISCHEN SAMMELREISE NACH BRASILIEN, INSBESONDERE IN DAS AMAZONASGEBIET, AUSGEFUHRT VON DR. H. ZERNY. X TEIL; DIPTERA: MUSCIDAE ACALYPTRATAE (EXCL. CHLOROPIDAE). Wien. Naturhist. Mus. Ann. 47: 61–106, illus.

HERING, E. M.

1937. NEUE NEOTROPISCHE BOHRFLIEGEN AUS DEM HAMBURGER MUSEUM. Rev. de Ent. 7: 296–302, illus.

1938. NEUE BOHRFLIEGEN AUS BRASILIEN (32. BEITRAGE ZUR KENNTNIS DER TRYPETIDAE). Rev. de Ent. 8: 187–196, illus.

1939. NEUE TRYPETIDEN DER ERDE. VII Internatl. Cong. Ent. (1938) 1: 165–190, illus.

1940a. 1. NEUE ARTEN UND GATTUNGEN. Siruna Seva 1: 1–16, illus.

1940b. NEUE ALT- UND NEUWELTLICHE BOHRFLIEGEN. Arb. über Morph. u. Taxonom. Ent. Berlin-Dahlem 7: 50–57, illus.

1941a. TRYPETIDAE. *In* Beitrage zur Fauna Perus, v. 1, pp. 121–176, illus. Jena.

1941b. FUNF NEUE NEOTROPISCHE FRUCHTFLIEGEN. Rev. de Ent. 12: 474–480, illus.

1941c. NEUE DACINAE UND TRYPETINAE DES ZOOLOGISCHEN MUSEUMS DER UNIVERSITAT BERLIN. Siruna Seva 3: 1–25, illus.

1941d. PTEROCALLIDAE BRASILIENSIS (DIPT.). München. Ent. Gesell. Mitt. 31: 197–201, illus.

1942. NEUE GATTUNGEN UND ARTEN PALAEARKTISCHER UND EXOTISCHER FRUCHTFLIEGEN. Siruna Seva 4: 1–31, illus.

1944a. NEUE GATTUNGEN UND ARTEN VON FRUCHTFLIEGEN DER ERDE. Siruna Seva 5: 1–17, illus.

1944b. BESTIMMUNGSTABELLE DER GATTUNG TEPHRITIS LATREILLE, 1804. Siruna Seva 5: 17–31.

1947a. NEUE GATTUNGEN UND ARTEN DER FRUCHTFLIEGEN. Siruna Seva 6: 1–12, illus.

1947b. BESTIMMUNGSTABELLE DER UNTERFAMILIEN UND TRIBUS DER TRYPETIDAE. Siruna Seva 6: 12–16.

1953. NEUE FRUCHTFLIEGEN VON CHINA, VORDERASIEN, BRASILIEN UND GUATEMALA. Siruna Seva 8: 1–16, illus.

1961. BEITRAGE ZUR KENNTNIS DER INSEKTFAUNA BOLIVIENS XVI. DIPTERA I. ALTE UND NEUE FRUCHTFLIEGEN VON BOLIVIEN. Opusc. Zool. 57: 1–7, illus.

INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE.

1963. OPINION 678. THE SUPPRESSION UNDER THE PLENARY POWERS OF THE PAMPHLET PUBLISHED BY MEIGEN, 1800. Internatl. Comn. Zool. Nomencl., Bul. Zool. Nomencl. 20: 339–342.

KORYTKOWSKI, C. A.

1971. A NEW CECIDOGENOUS SPECIES OF THE GENUS POLYMORPHOMYIA SNOW (DIPTERA: TEPHRITIDAE). Wash. Ent. Soc. Proc. 73: 446–449, illus.

LATREILLE, P. A.

1804. TABLEAU METHODIQUE DES INSECTES. *In* Soc. Nat. et d'Agr., Nouveau Dictionnaire d'Histoire Naturelle, Appliqué. aux Artes, Principalement à l'Agriculture et à l'Economie Rurale et Domestique, v. 24, sect. 3, pp. 129–200. Paris.

LIMA, A. DA COSTA.

1933. NOTAS SOBRE TRYPETIDAS BRASILIERAS (I). Rev. de Ent. 3: 382–384, illus.

1934a. MOSCAS DE FRUTAS DO GENERO ANASTREPHA SCHINER, 1868. Inst. Oswaldo Cruz Mem. 28: 487–575, illus.

1934b. NOTAS SOBRE TRIPETIDAS BRASILIERAS (II). ESPECIES CECIDOGENAS DA AMERICA DO SUL. Inst. de Biol. Veg. Arq. 1: 115–130, illus.

1934c. NOTAS SOBRE TRIPETIDAS BRASILIERAS (III). Inst. de Biol. Veg. Arq. 1: 139–141, illus.

1935a. NOTAS SOBRE TRYPETIDAS BRASILIERAS (IV). MOSCAS DO GENERA HEXACHAETA LOEW. Acad. Brasil. de Cien. An. 7: 235–250.

LIMA, A. DA COSTA.
1935b. NOTAS SOBRE TRYPETIDAS BRASILIERAS (V). Rev. de Ent. 5: 199–202, illus.

———
1953a. MOSCAS DE FRUTAS DO U.S. NATIONAL MUSEUM (SMITHSONIAN INSTITUTION) (I). Acad. Brasil. de Cien. An. 25: 151–152, illus.

———
1953b. MOSCAS DE FRUTAS DO U.S. NATIONAL MUSEUM (SMITHSONIAN INSTITUTION) (II). Acad. Brasil. de Cien. An. 25: 153–155, illus.

———
1953c. MOSCAS DE FRUTAS DO U.S. NATIONAL MUSEUM (SMITHSONIAN INSTITUTION) (III). Acad. Brasil. de Cien. An. 25: 557–566, illus.

———
1954. MOSCAS DE FRUTAS DO U.S. NATIONAL MUSEUM (SMITHSONIAN INSTITUTION) (IV). Acad. Brasil. de Cien. An. 26: 277–282, illus.

——— and LEITE, I. DA COSTA.
1952. MOSCAS DO GENEROS HEXACHAETA E BLEPHARONEURA. Inst. Oswaldo Cruz Mem. 50: 297–310, illus.

——— and LEITE, I. DA COSTA.
1862. DIE EUROPAISCHEN BOHRFLIEGEN (TRYPETIDAE). 128 pp., illus. Wien, Austria.

——— and LEITE, I. DA COSTA.
1873. MONOGRAPHS OF THE DIPTERA OF NORTH AMERICA. PART III. Smithsn. Misc. Collect. 11 (39 (=publ. 256)): 1–351, illus.

LUTZ, A., and LIMA, A. DA COSTA.
1918. CONTRIBUCAO PARA ESTUDO DAS TRIPANEIDAS (MOSCAS DE FRUTAS) BRASILIERAS. Inst. Oswaldo Cruz Mem. 10: 5–15, illus.

MCFADDEN, M. W., and FOOTE, R. H.
1961. THE GENUS ORELLIA R.-D. IN AMERICA NORTH OF MEXICO. Wash. Ent. Soc. Proc. 62 (1960): 253–261, illus.

MACLEAY, W. S.
1829. NOTICE OF CERATITIS CITRIPERDA, AN INSECT VERY DESTRUCTIVE TO ORANGES. Zool. Jour. (London): 4: 475–482.

MALLOCH, J. R.
1933. ACALYPTRATA. *In* Brit. Mus. (Nat. Hist.), Diptera of Patagonia and South Chile, fasc. 4, pt. 6, pp. 177–391, illus. London.

———
1941a. THE AMERICAN GENUS PARACANTHA COQUILLETT. Rev. de Ent. 12: 32–42, illus.

———
1941b. VENEZUELAN DIPTERA. I. Soc. Venezol. de Cien. Nat. Bol. 7: 123–126, illus.

MEIGEN, J. W.
1800. NOUVELLE CLASSIFICATION DES MOUCHES A DEUX AILES (DIPTERA L.) D'APRES UN PLAN TOUTE NOUVEAU. 40 pp. Paris.

———
1803. VERSUCH EINER NEUEN GATTUNGSEINTHEILUNG DER EUROPAISCHEN ZWEFLUGELIGEN INSEKTEN. Mag. f. Insektenkunde 2: 259–281.

MUNRO, H. K.
1947. AFRICAN TRYPETIDAE (DIPTERA). So. Africa Ent. Soc. Mem. 1: 1–284, illus.

———
1957. TRYPETIDAE. *In* Brit. Mus. (Nat. Hist.), Ruwenzori Expedition, 1934–35, v. 2 (9): 853–1054, illus.

———
1964. THE GENUS TRUPANEA IN AFRICA. So. Africa Ent. Mem., Dept. Agr. Tech. Serv., Rpt. 8: 1–101, illus.

NOVAK, J. A.
1974. A TAXONOMIC REVISION OF DIOXYNA AND PAROXYNA (DIPTERA: TEPHRITIDAE) FOR AMERICA NORTH OF MEXICO. Melanderia 16: 1–53, illus.

OSTEN-SACKEN, C. R.
1878. CATALOG OF THE DESCRIBED DIPTERA OF NORTH AMERICA. Ed. 2. Smithsn. Misc. Collect. 270: 1–276.

PHILIPPI, R. A.
1873. CHILENISCHE INSEKTEN. Stettin Ent. Ztg. 34: 296–321, illus.

PHILLIPS, V. T.
1923. A REVISION OF THE TRYPETIDAE OF NORTHEASTERN AMERICA. N.Y. Ent. Soc. Jour. 31: 119–154, illus.

QUISENBERRY, B. F.
1949a. THE GENUS OXYNA IN THE NEARCTIC REGION NORTH OF MEXICO (DIPTERA: TEPHRITIDAE). Pan-Pacific Ent. 25: 71–76, illus.

———
1949b. NOTES AND DESCRIPTIONS OF NORTH AMERICAN TEPHRITIDAE (DIPTERA). Kans. Ent. Soc. Jour. 22: 81–88, illus.

———
1950. THE GENUS EUARESTA IN THE UNITED STATES. N.Y. Ent. Soc. Jour. 58: 9–38, illus.

RHODE, R. H.
1976. THE HISTORY AND CURRENT STATUS OF THE MEDITERRANEAN FRUIT FLY IN NORTH AMERICA. Rio Grande Valley Hort. Soc. Jour. 30: 11–17.

ROBINEAU-DESVOIDY, J. B.
1830. ESSAI SUR LES MYODAIRES. [Paris] Inst. de France [Cl. des] Sci., Math. et Phys., Acad. Roy. des Sci., Mem., ser. 2, 2: 1–813.

RONDANI, C.
1856. DIPTEROLOGIAE ITALICAE PRODROMUS. V. 1: GENERA ITALICA ORDINIS DIPTERORUM ORDINATUM DISPOSITA ET DISTINCTA ET IN FAMILIAS ET STIRPES AGGREGATA. 228 pp. Parma, Italy.

———
1868. DIPTERA ALIQUA IN AMERICA MERIDIONALI LECTA. Soc. Nat. di Modena Ann. 3: 24–40, illus.

———
1870. ORTALIDINAE ITALICAE COLLECTAE, DISTINCTAE ET IN ORDINEM DISPOSITAE. Soc. Ent. Ital. Bul. 2: 5–31.

———
1871. ORTALIDINAE ITALICAE COLLECTAE, DISTINCTAE ET IN ORDINEM DISPOSITAE. Soc. Ent. Ital. Bul. 3: 3–24, 161–188.

SCHINER, I. R.
1868. DIPTERA (ART. 1). *In* Reise der Österreichischen Fregatte Novara. Zoology 2, abt. 1, sect. B, pp. 1–388. Wien, Austria.

SCHRANK, F. VON P.
1795. NATURHISTORISCHE UND OKONOMISCHE BRIEFE UBER DAS DONAUMOOR. 211 pp., illus. Mannheim, Germany.

SNOW, W. A.
1894. DESCRIPTIONS OF NORTH AMERICAN TRYPETIDAE, WITH NOTES. Kans. Univ. Quart. 2: 159–174, illus.

STEYSKAL, G. C.
1970. ENSINA SONCHI (L.) IN SOUTH AMERICA (DIPTERA: TEPHRITIDAE). Wash. Acad. Sci. Jour. 60: 158–159.

———
1972a. EUARESTA RETICULATA (HENDEL), NEW COMBINATION (DIPTERA: TEPHRITIDAE). Wash. Ent. Soc. Proc. 74: 130.

———
1972b. A PRELIMINARY KEY TO THE SPECIES OF THE NEOTROPICAL GENUS TETREUARESTA HENDEL. Wash. Ent. Soc. Proc. 74: 403–405.

———
1972c. A PRELIMINARY KEY TO THE SPECIES OF NEOTEPHRITIS HENDEL (DIPTERA: TEPHRITIDAE). Wash. Ent. Soc. Proc. 74: 414–416.

———
1972d. A NEW SPECIES OF MYOLEJA WITH A KEY TO NORTH AMERICAN SPECIES. Fla. Ent. 55: 207–211, illus.

———
1974. ADDITIONAL DATA ON TEPHRITIS UNICOLOR WALKER, 1837, NEWLY REFERRED TO THE GENUS LAMPROXYNELLA HERING (DIPTERA: TEPHRITIDAE). Wash. Ent. Soc. Proc. 76: 49–51.

———
1977a. TWO NEW NEOTROPICAL FRUITFLIES OF THE GENUS ANASTREPHA, WITH NOTES ON GENERIC SYNONYMY (DIPTERA: TEPHRITIDAE). Wash. Ent. Soc. Proc. 79: 75–81, illus.

———
1977b. PICTORIAL KEY TO THE SPECIES OF THE GENUS ANASTREPHA (DIPTERA: TEPHRITIDAE). 35 pp., illus. Wash. Ent. Soc., Washington, D.C.

——— and FOOTE, R. H.
1977. REVISIONARY NOTES ON NORTH AMERICAN TEPHRITIDAE (DIPTERA), WITH KEYS AND DESCRIPTIONS OF NEW SPECIES. Wash. Ent. Soc. Proc. 79: 146–155, illus.

STOLTZFUS, W. B.
1977. THE TAXONOMY AND BIOLOGY OF EUTRETA (DIPTERA: TEPHRITIDAE). Iowa State Jour. Res. 51: 369–438, illus.

STONE, A.
1939a. A REVISION OF THE GENUS PSEUDODACUS HENDEL. Rev. de Ent. 10: 282–289, illus.

———
1939b. A NEW GENUS OF TRYPETIDAE NEAR ANASTREPHA. Wash. Acad. Sci. Jour. 29: 340–350, illus.

———
1942. THE FRUITFLIES OF THE GENUS ANASTREPHA. U.S. Dept. Agr. Misc. Pub. 439, 112 pp., illus.

WALKER, F.
1836. DESCRIPTIONS OF THE BRITISH TEPHRITITES. Ent. Mag. (London) 3: 57–85, illus.

WESTWOOD, J. O.
1840. ORDER XIII. DIPTERA ARISTOTLE (ANTLIATA FABRICIUS. HALTERIPTERA CLAIRV.). *His* An Introduction to the Modern Classification of Insects. Synopsis of the Genera of British Insects, pp. 125–158. London.

WULP, F. M. VAN DER.
1899. GROUP TRYPETINAE. *In* Godman, F. D., and Salvin, O., eds., Biologia Centrali-Americana, Zoology-Insects-Diptera, v. 2, pp. 401–416, illus. London, England.

———
1900. GROUP TRYPETINAE. *In* Godman, F. D., and Salvin, O., eds., Biologia Centrali-Americana, Zoology-Insects-Diptera, v. 2, pp. 417–428, pls. 11, 12. London, England.

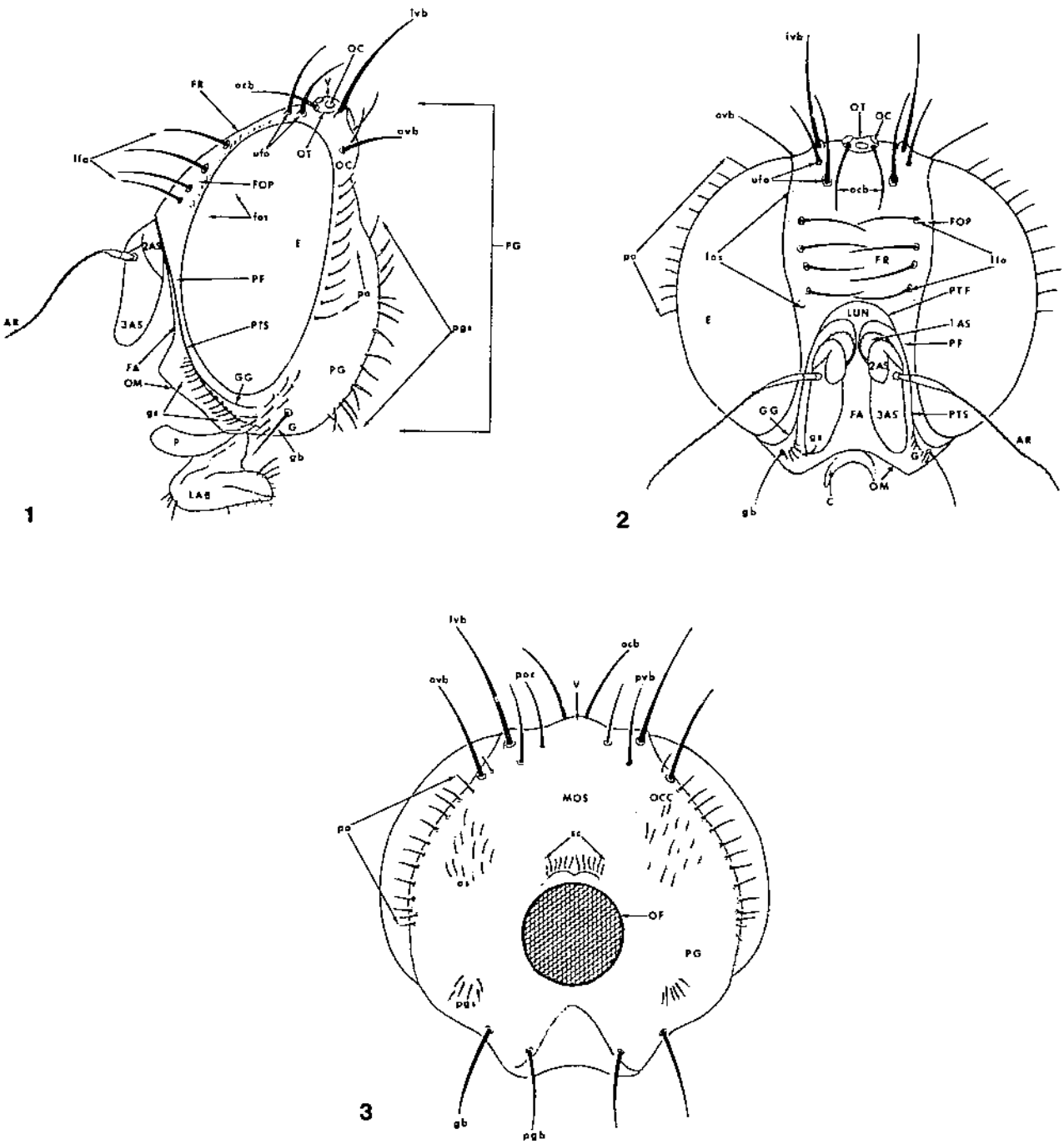
YEPEZ, F. F.
1953. CONTRIBUCION AL ESTUDIO DE LAS MOSCAS DE LAS FRUTAS DEL GENERO ANASTREPHA SCHINER (DIPTERA: TRYPETIDAE) DE VENEZUELA. II Cong. Cien. Nat. Afines (Caracas), Cuaderno No. 7, 42 pp., illus.

ZIA, Y.
1937. STUDY ON THE TRYPETIDAE OR FRUIT FLIES OF CHINA. Sinensia 8: 103–219, illus.

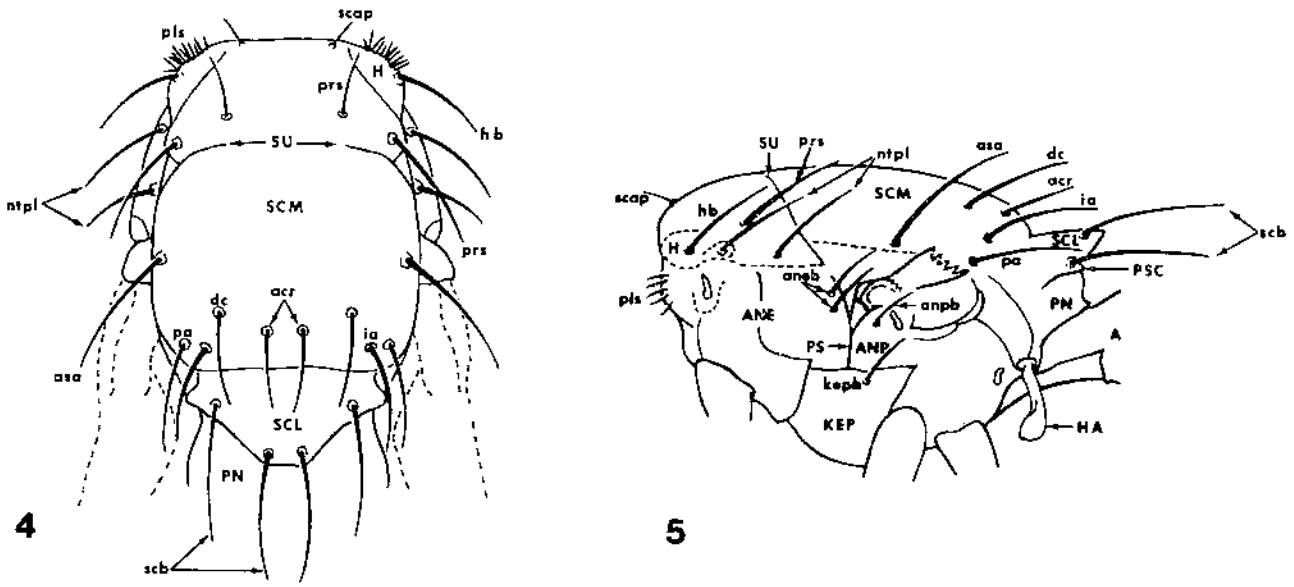
——— and CHEN, C. H.
1938. TRYPETIDAE OF NORTH CHINA. Sinensia 9: 1–172, illus.

INDEX OF NAMES

Boldface numbers refer to principal discussion, italic to key, and roman to other mention.



FIGURES 1–3.—Head of *Anastrepha ludens* (Loew), female: 1, Side view; 2, front view; 3, hind view. (AR, arista; 1AS, first antennal segment; 2AS, second antennal segment; 3AS, third antennal segment; C, clypeus; E, compound eye; FA, face; FOP, fronto-orbital plate; fos, fronto-orbital setulae; FR, frons; G, gena; gb, genal bristle; GG, genal groove; gs, genal setulae; ivb, inner vertical bristle; LAB, labellum; lfo, lower fronto-orbital bristles; LUN, lunule; MOS, median occipital sclerite; OC, ocellus; ocb, ocellar bristle; OCC, occiput; OF, occipital foramen; OM, oral margin; os, occipital setulae; OT, ocellar triangle; ovb, outer vertical bristle; P, palpus; PF, parafacial; PG, postgena; pgb, postgenal bristle; pgs, postgenal setulae; po, postocular bristle; poc, postocular seta; PTF, ptilinal furca; PTS, ptilinal suture (facial ridge); pvb, postvertical bristle; sc, supracervical setulae; ufo, upper fronto-orbital bristles; V, vertex.)



FIGURES 4–5.—Thorax of *Anastrepha ludens* (Loew), female: 4, Dorsal view; 5, side view. Prescutellar bristle added. (A, abdomen; acr, acrostichal bristles; ANE, anepisternum; aneb, anepisternal bristles; ANP, anepimeron; anpb, anepimeral bristle; asa, supra-alar bristle; dc, dorsocentral bristle; H, humerus; HA, halter; hb, humeral bristle; ia, intra-alar bristle; KEP, katepisternum; kepb, katepisternal bristle; ntpl, notopleural bristle; pa, postalar bristle; pls, propleural setulae; PN, postnotum; prs, presutural bristle; PS, pleural suture; PSC, postscutellum; scap, scapular setae; scb, scutellar bristles; SCL, scutellum; SCM, scutum; SU, transverse suture.)

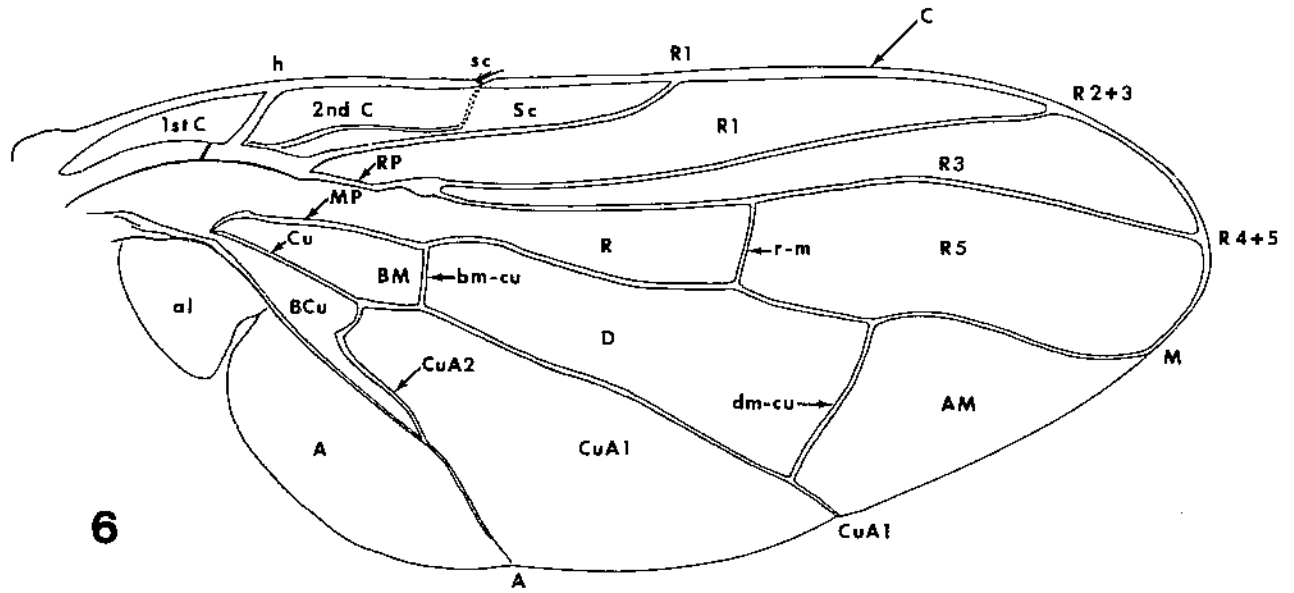
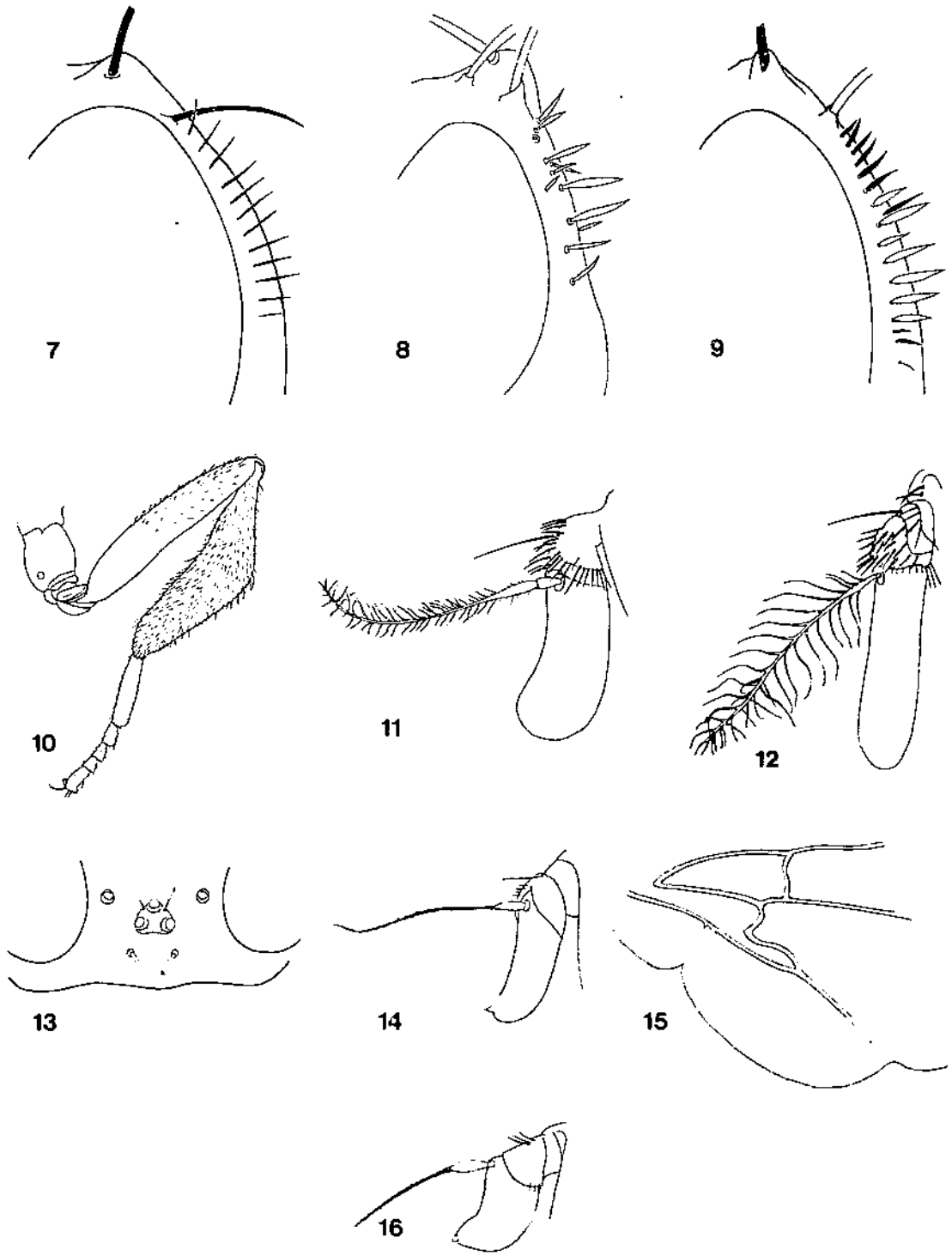
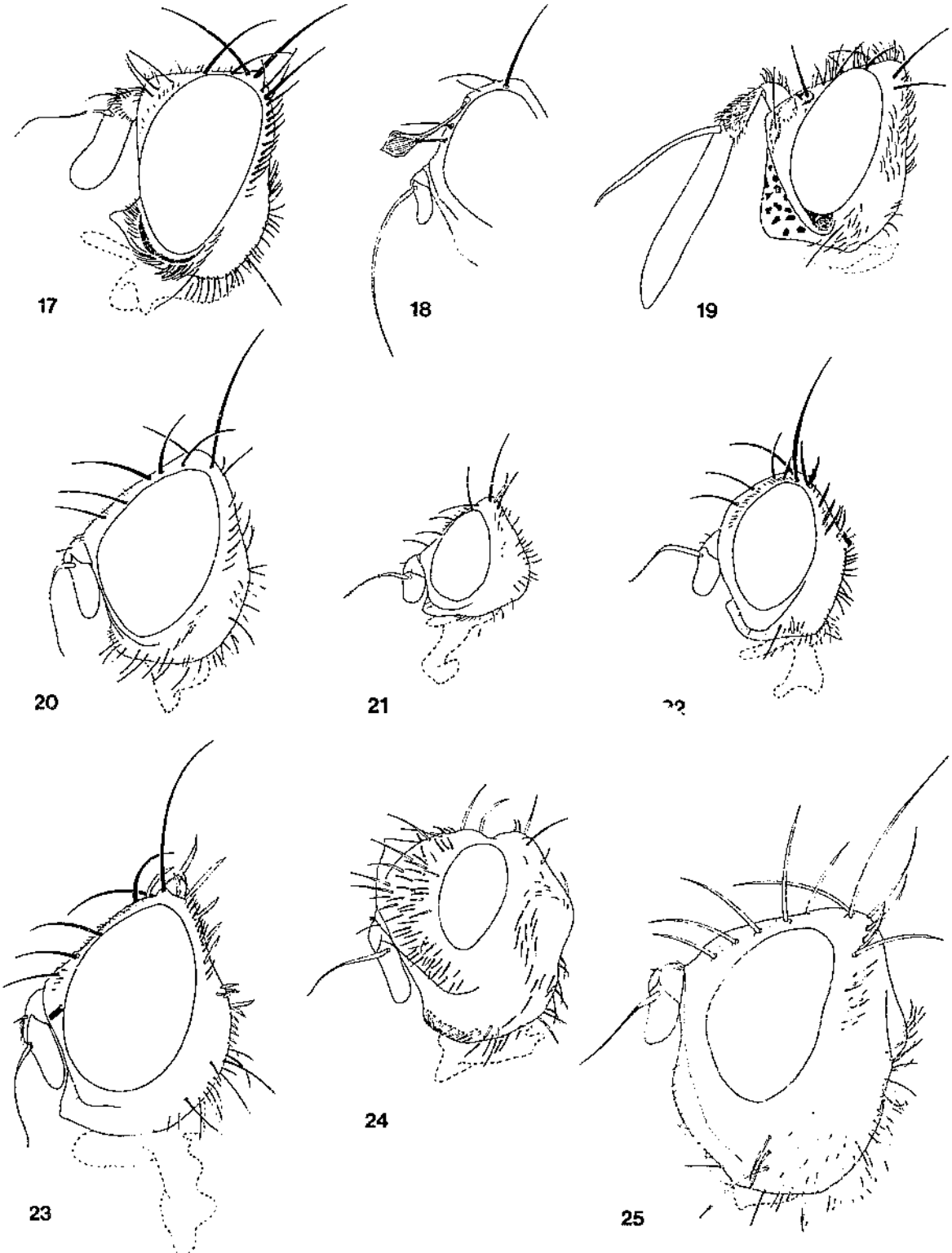


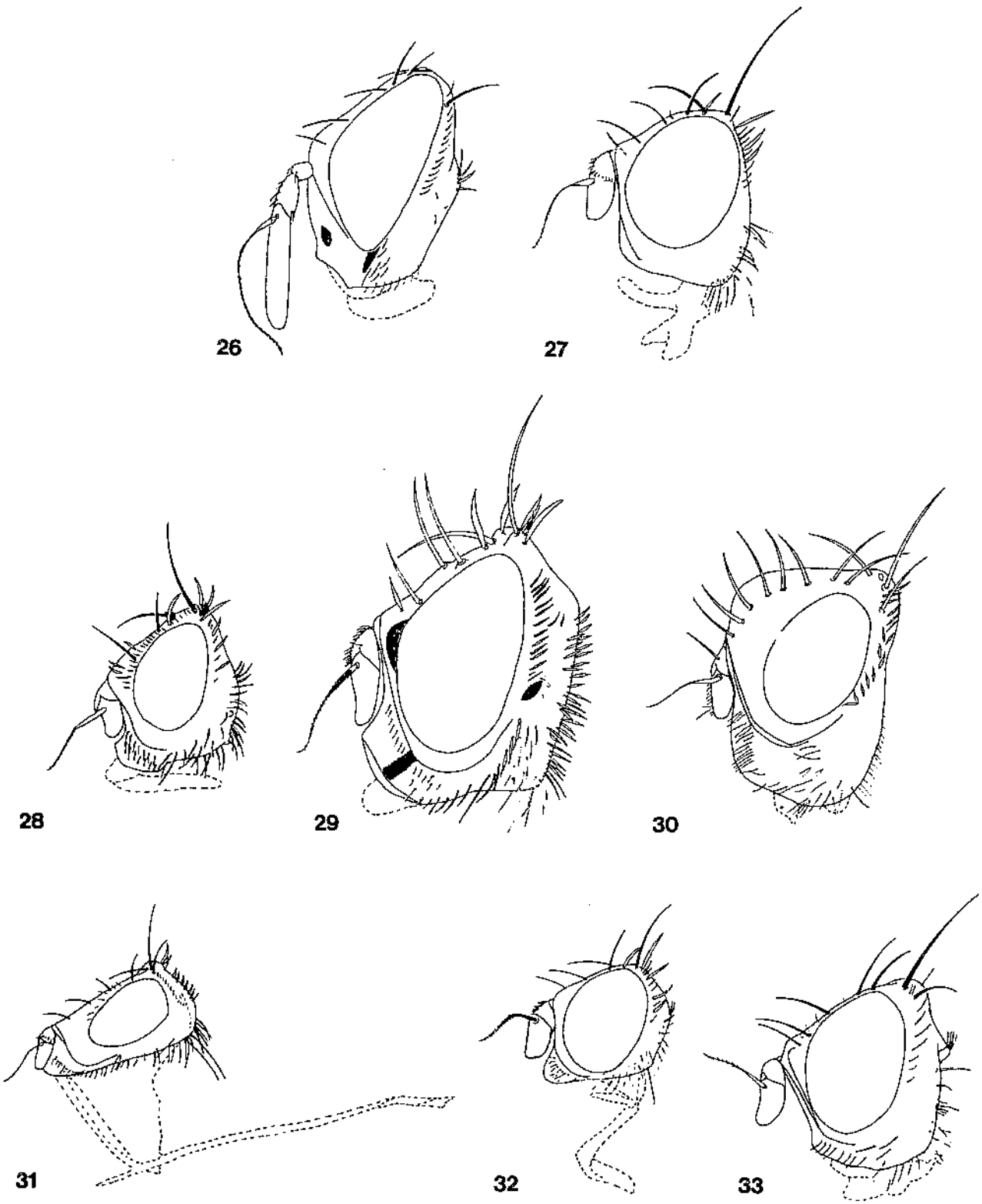
FIGURE 6.—Right wing, *Anastrepha ludens* (Loew), female. (A, anal cell; al, alula; AM, apical medial cell; BCu, basal cubital cell; BM, basal medial cell; bm–cu, basal mediocubital crossvein; C, costa; 1st C, first costal cell; 2nd C, second costal cell; Cu, cubital vein; CuA1, anterior (apical) cubital cell; CuA1, CuA2, anterior cubital veins; D, discal cell; dm–cu, distal mediocubital crossvein; h, humeral crossvein; M, medial vein; MP, medial sector; R, R1, R3, R5, radial cells; R1, R2+3, R4+5, radial veins; r–m, radiomedial crossvein; RP, radial sector; Sc, subcostal cell; sc, subcostal vein.)



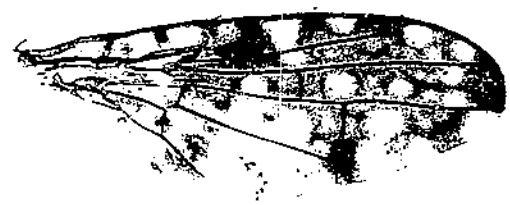
FIGURES 7–16.—Side view of head, showing postocular bristles: 7, *Rhagoletis pomonella* (Walsh); 8, *Euaresta aequalis* (Loew); 9, *Paracantha cultaris* (Coquillett). 10, *Pyrgotoides crassipes* Curran, hind leg; 11, *Blepharoneura* sp., left antenna; 12, *Molynocoelia* sp., left antenna; 13, *Myoleja* sp., top view of head, showing ocellar triangle and ocellar bristles; 14, *Zonosemata vittigera* (Coquillett), left antenna; 15, *Ceratitis capitata* (Wiedemann), basal half of right wing, showing posterior extension of basal cubital cell; and 16, *Xenochaeta* sp., left antenna.



FIGURES 17–25.—Side view of heads of Tephritidae: 17, *Blepharoneura* sp.; 18, *Ceratitis capitata* (Wiedemann); 19, *Ceratodacus* sp.; 20, *Chetostoma* sp.; 21, *Ensina* sp.; 22, *Euaresta* sp.; 23, *Eutreta* sp.; 24, *Gerrhoceras* sp.; and 25, *Gymnocarena* sp.

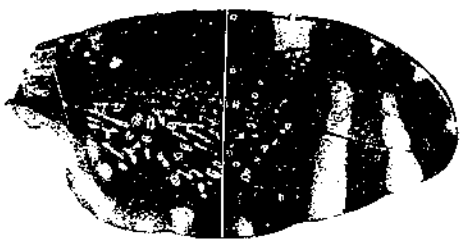


FIGURES 26–33.—Side view of heads of Tephritidae: 26, *Lezca tau* Foote; 27, *Neotephritis finalis* (Loew); 28, *Oxyna* sp.; 29, *Paracantha cultaris* (Coquillett); 30, *Polionota* sp.; 31, *Protensina* sp.; 32, *Paroxyna* sp.; and 33, *Trypeta* sp.



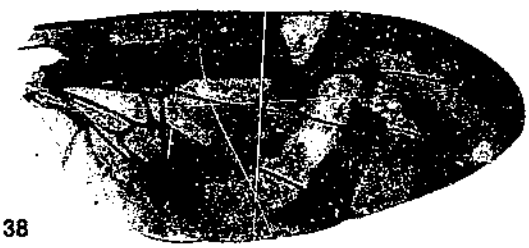
34

35



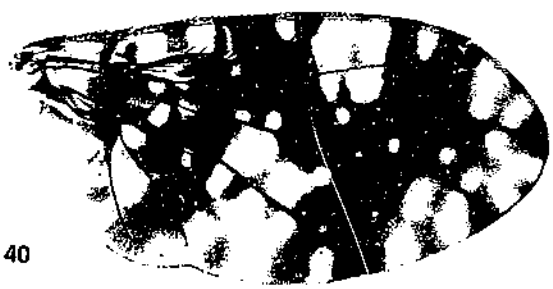
36

37



38

39



40

41

FIGURES 34–41.—Wings of Tephritidae: 34, *Acinia* sp.; 35, *Aciurina mexicana* (Aczél); 36, *Acrotaenia testudinea* (Loew); 37, *Acrotaeniacantha* sp.; 38, *Anastrepha obliqua* (Macquart); 39, *Anomoia* sp.; 40, *Blepharoneura* sp.; 41, *Caenoriata pertinax* (Bates).

42

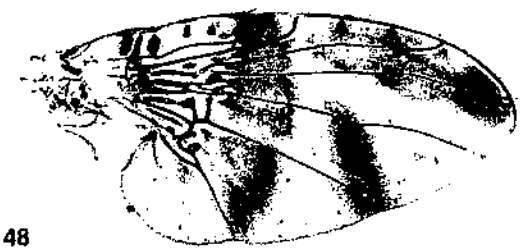
43

44

45

46

47



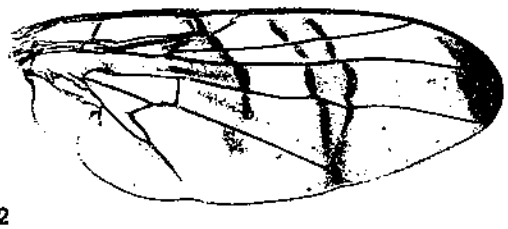
48

49

FIGURES 42–49.—Wings of Tephritidae: 42, *Cecidocharella* sp.; 43, *Cecidochares* sp.; 44, *Celidosphenella* sp. (male); 45, *Celidospenella* sp. (female); 46, *Celidosphenella* sp. (male); 47, *Celidosphenella* sp. (female); 48, *Ceratitis capitata* (Wiedemann); 49, *Ceratodacus longicornis* Hendel.

50

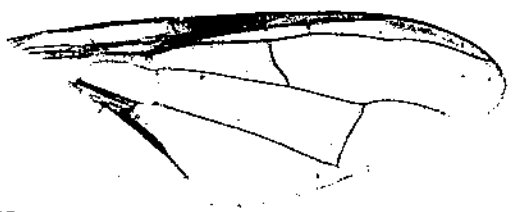
51



52

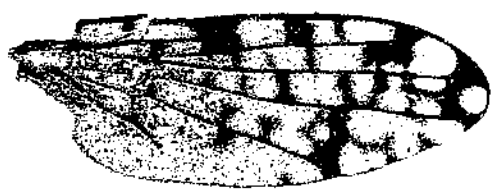
53

54



55

56

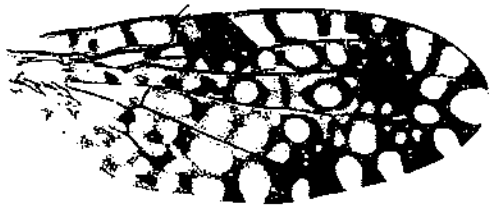


57

FIGURES 50–57.—Wings of Tephritidae: 50, *Chetostoma rubida* (Coquillett); 51, *Chrysaciura bipunctata* Aczél; 52, *Cryptodacus* sp.; 53, *Cryptoplagia cuculiforme* Aczél; 54, *Cryptotreta* sp.; 55, *Dacus dorsalis* Hendel; 56, *Dictyotrypeta* sp.; 57, *Dioxyna picciola* (Bigot).

58

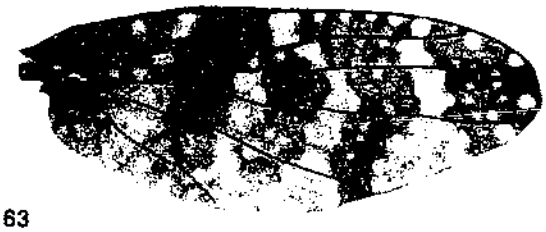
59



60

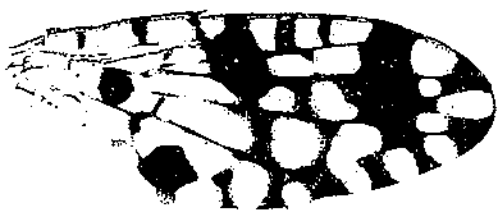
61

62



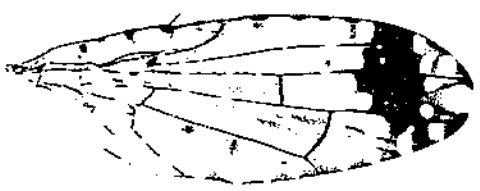
63

64



65

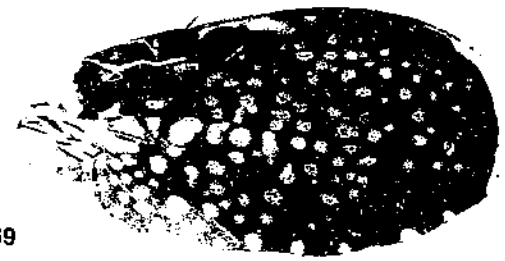
FIGURES 58–65.—Wings of Tephritidae: 58, *Dracontomyia footei* Aczél; 59, *Dyseuaresta trinotata* Bates; 60, *D. caracasana* (Fernandez); 61, *Dyseuaresta* sp.; 62, *D. mexicana* (Weidemann); 63, *Epochrinopsis* sp.; 64, *Euaresta bella* (Loew); 65, *E. bullans* (Wiedemann).



66

67

68



69

70

71

72

73

FIGURES 66–73.—Wings of Tephritidae: 66, *Euaresta reticulata* (Hendel); 67, *Euarestoides acutangulus* (Thomson); 68, *Euarestoides* sp.; 69, *Eutreta hespera* (Banks); 70, *Gerrhoceras* sp.; 71, *Gonioxyna* sp.; 72, *Goniurellia* sp.; 73, *Gymnocarena* sp.

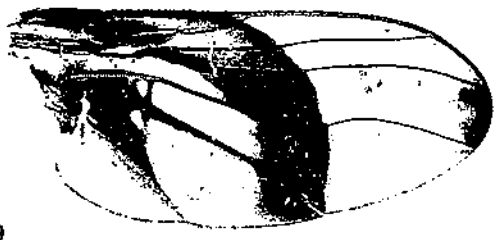
74

75

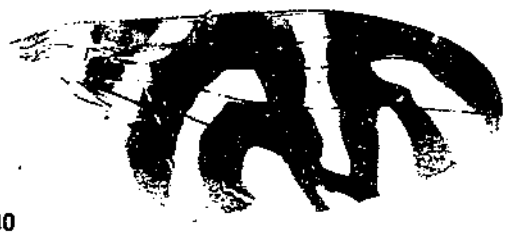
76

77

78



79

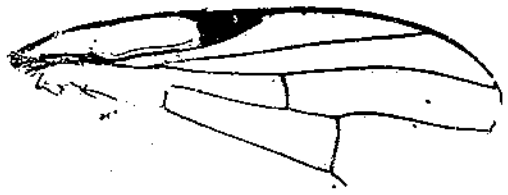


80

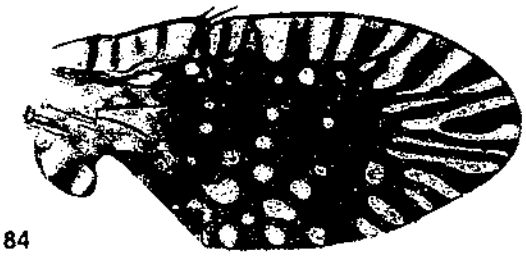
81

FIGURES 74–81.—Wings of Tephritidae: 74, *Haywardina cuculi* Hendel; 75, *Hexachaeta obscura* Hendel; 76, *Homoeothrix* sp.; 77, *Laksyetsa trinotata* Foote; 78, *Lamproxynella unicolor* (Walker); 79, *Lezca tau* Foote; 80, "*Metasphenisca*" *flexuosa* Bigot; 81, *Molynocoelia* sp.

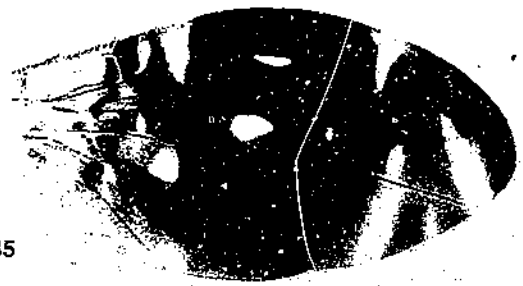
82



83



84



85

86

87

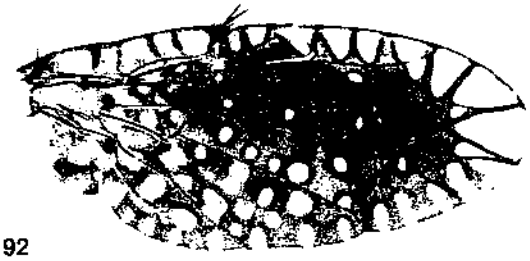
88

89

FIGURES 82–89.—Wings of Tephritidae: 82, *Myoleja* sp.; 83, *Neaspilota albidipennis* (Loew); 84, *Neorhabdochaeta* sp.; 85, *Neotaracia imox* (Bates); 86, *Neotephritis finalis* (Loew); 87, *Neotephritis* sp.; 88, *Oedicarena* sp.; 89, *Orellia palposa* (Loew).

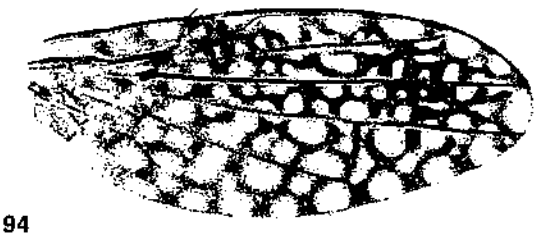
90

91



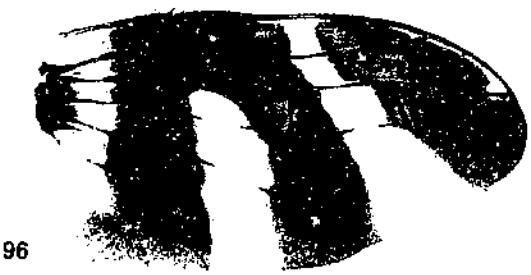
92

93



94

95



96

97

FIGURES 90–97.—Wings of Tephritidae: 90, *Ostracocoelia* sp.; 91, *Oxyna aterrima* (Doane); 92, *Paracantha cultaris* Coquillett; 93, *Parastenopa* sp.; 94, *Plaumannimyia* sp.; 95, *Polionota* sp.; 96, *Procecidochares anthracina* (Doane); 97, *Procecidocharoides flavissima* Foote.


98


99


100


101

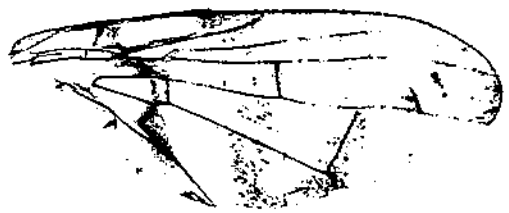

102


103


104


105

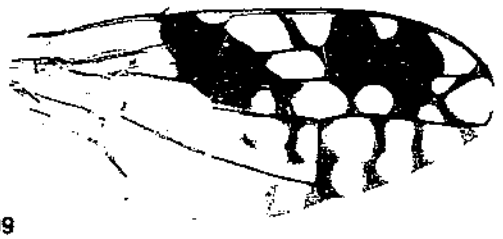
FIGURES 98–105.—Wings of Tephritidae: 98, *Pseudacrotaenia* sp.; 99, *Pseudeutreta anteapicalis* Hendel; 100, *Pseudoedaspis* sp.; 101, *Pseudophorellia stonei* Lima; 102, *Rhachiptera* sp.; 103, *Rhagoletis pomonella* (Walsh); 104, *Rhagoletotrypeta rohweri* Foote; 105, *Rhithrum rivulatum* Hendel.



106

107

108



109

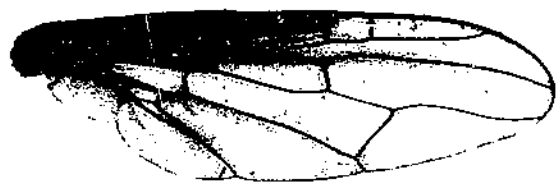
110

111

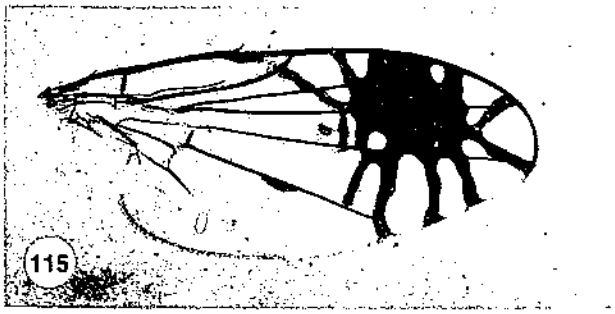
112

113

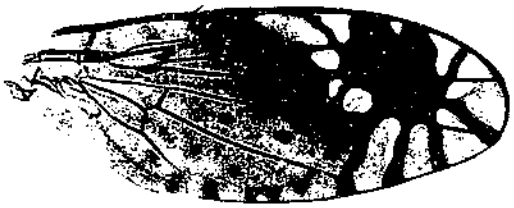
FIGURES 106–113.—Wings of Tephritidae: 106, *Stoneola* sp.; 107, *Strobelia baccharidis* Rondani; 108, *Paroxyna* sp.; 109, *Tephritis* sp.; 110, *Tephritis* sp.; 111, *Tephritis* sp.; 112, *Tetreuaresta obscuriventris* (Loew); 113, *Tomoplagia cressoni* Aczél.



114

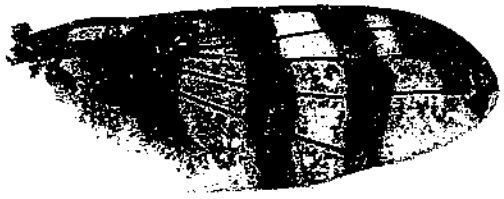


115



116

117



118

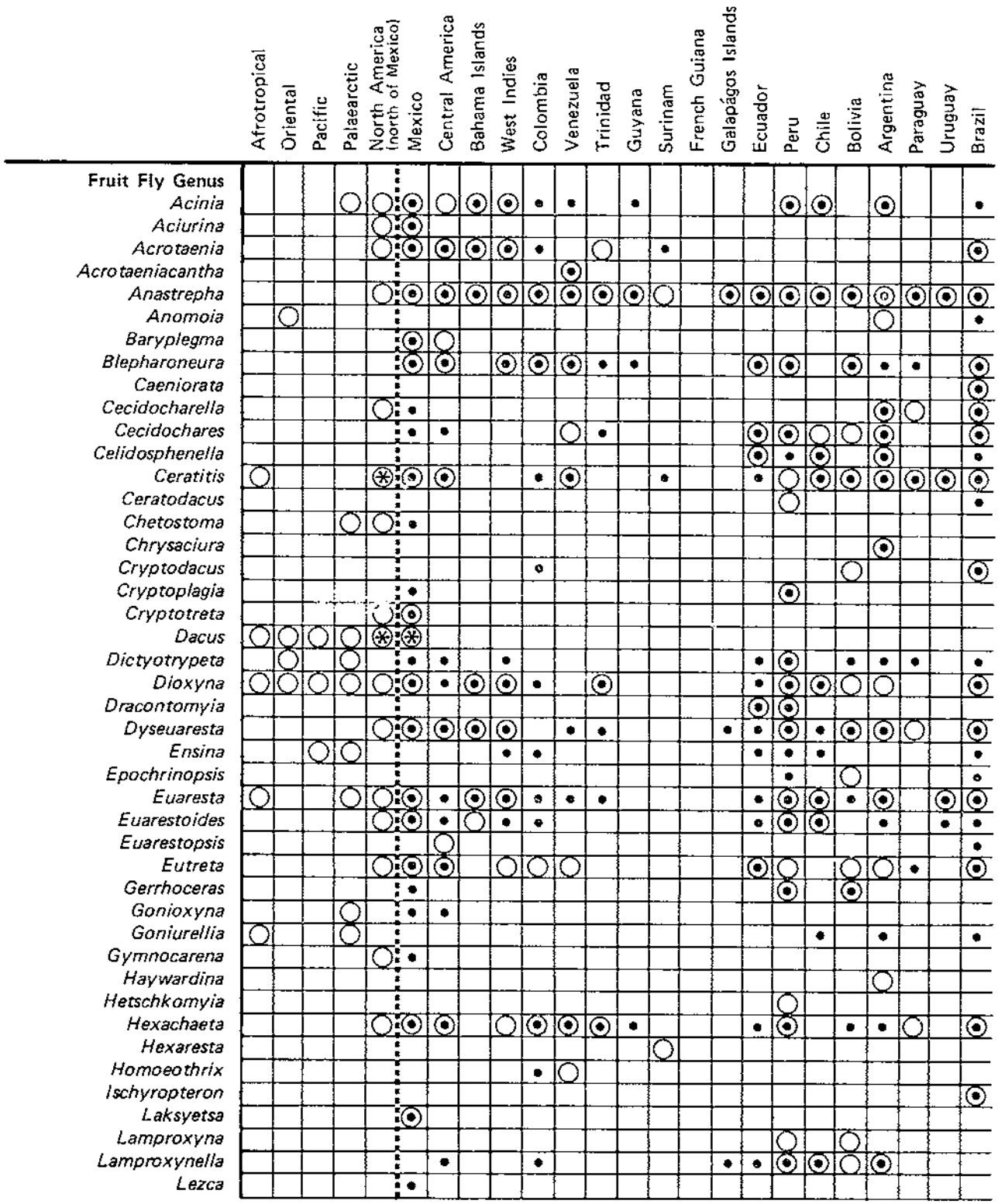
119

120

121

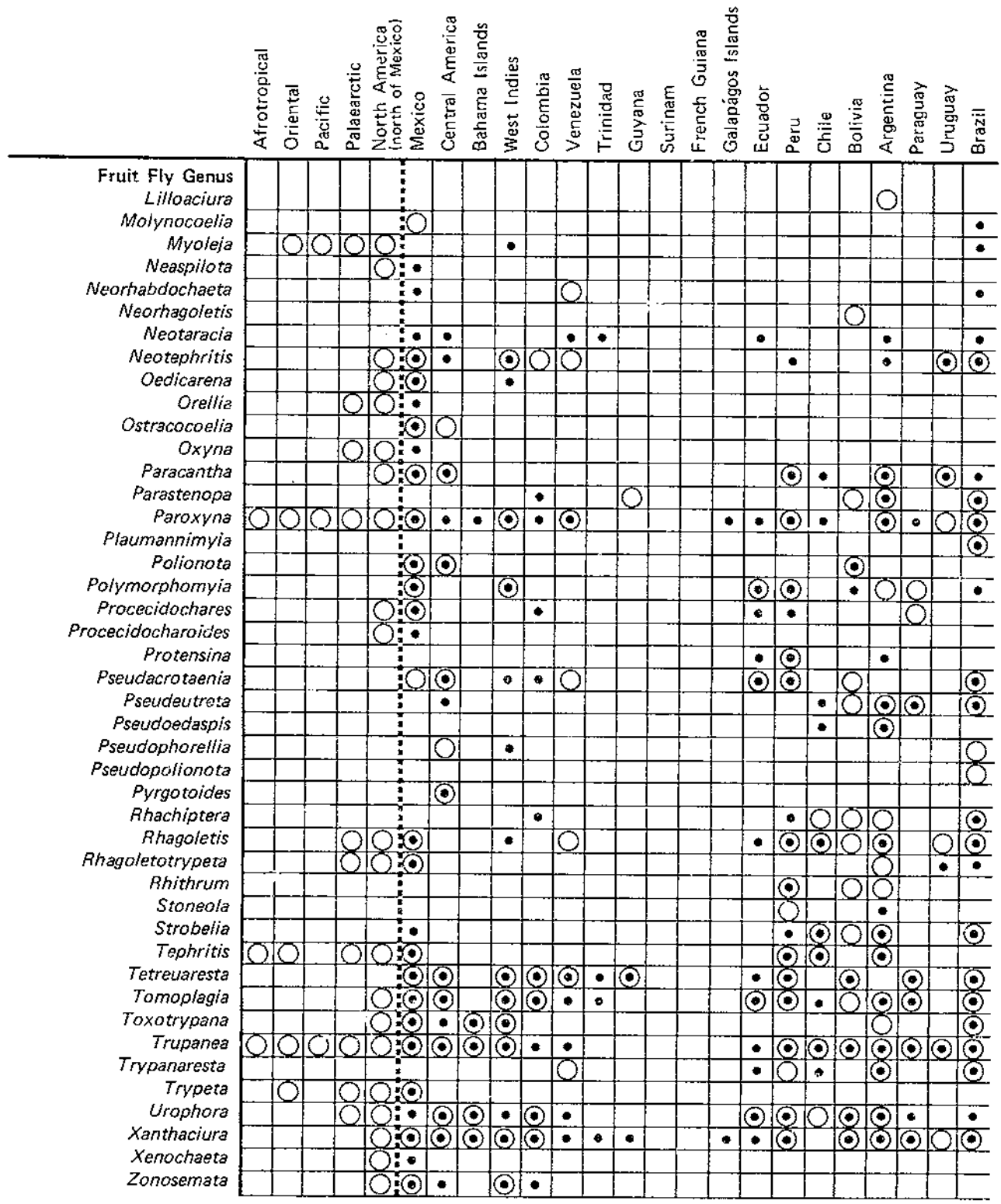
FIGURES 114–121.—Wings of Tephritidae: 114, *Toxotrypana curvicauda* (Gerstäcker); 115, *Trupanea signata* Foote; 116, *Trypanaresta* sp.; 117, *Trypeta* sp.; 118, *Urophora* sp.; 119, *Xanthaciura insecta* (Loew); 120, *Xenochaeta aurantiaca* (Doane); 121, *Zonosemata vittigera* (Coquillett).

TABLE 1.—*Distribution of fruit fly genera south of the United States*



○ Reported in literature
• Specimens seen in this study
◉ Specimens seen in this study and reported in literature
⊛ Specimens introduced and reported in literature

TABLE 1.—*Distribution of fruit fly genera south of the United States*—Continued



○ Reported in literature

• Specimens seen in this study

◉ Specimens seen in this study and reported in literature

☆ U.S. GOVERNMENT PRINTING OFFICE: 1980 O—299-245

U.S. DEPARTMENT OF AGRICULTURE
SCIENCE AND EDUCATION ADMINISTRATION
WASHINGTON, D.C. 20250

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

POSTAGE AND FEES PAID
U. S. DEPARTMENT OF
AGRICULTURE
AGR 101

END