

TAXONOMIC OBSERVATIONS ON UNITED STATES TEPHRTIDAE  
(DIPTERA), WITH DESCRIPTIONS OF NEW SPECIES

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*Abstract.*—Seven new species of Tephritidae from the United States are described: *Eutreta modocorum* Blanc, *E. navajorum* Blanc, *Gymnocarena flava* Foote, *Trupanea viciniformis* Foote, *Urophora claripennis* Foote, *U. setosa* Foote, and *Valentibulla dodsoni* Foote. *Gymnocarena bicolor* Foote is transferred to *Mylogymnocarena* (n. comb.), *Paroxyyna americana* Hering is a new synonym of *P. genalis* (Thomson), and *Xanthaciura chrysura* (Thomson) is further described. A review of *Gymnocarena* and *Mylogymnocarena* and taxonomic observations on all included species are presented.

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While identifying large numbers of fruit flies in the course of preparing a handbook of the Tephritidae of North America north of Mexico, we have encountered a number of taxonomic problems and hitherto undescribed species. The present paper presents our solutions to some of these problems and the descriptions of seven new species which need names prior to publication of the handbook.

Letter abbreviations representing the various private and institutional collections from which specimens were borrowed for this study, and in which type material of the newly described species is deposited, are listed in our acknowledgment section.

*Eutreta* Loew

*Icaria* Schiner, 1868: 276 (type species, *Trypeta sparsa* Wiedemann, 1830: 492; preocc. Saussure, 1853).

*Eutreta* Loew, 1873: 276 (type species, *Trypeta sparsa* Wiedemann, 1830: 492, des. by Coquillett, 1910: 543).

Stoltzfus (1977) clarified the status of this genus and its component species in his ex-

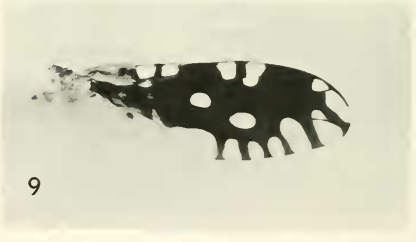
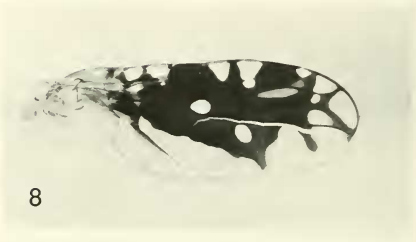
cellent revision of the New World fauna. Since then, three additional species have been discovered: *E. coalita* Blanc (Foote and Blanc, 1979) from California, and the following ones from California and Arizona.

*Eutreta modocorum* Blanc, NEW SPECIES

Fig. 1

*Diagnosis.*—In profile, oral margin only slightly produced; costal margin without hyaline spots; antenna short, not attaining oral margin; wing black; pleuron pinkish amber.

*Female.*—*Head:* General color pink; frons pinkish gray; lunule dark gray; antenna pink to light brown, 0.4 mm long, reaching about  $\frac{2}{3}$  of way to oral margin; arista black, amber near base; face pink, turning more pale gray near median and oral margins, without spots; oral margin only slightly produced; parafacial with whitish pollinosity; palpus pink with 8-10 anteroventral setae ranging from white near base to dark brown near tip; lower fronto-orbitals, anterior upper fronto-orbitals, ocellars, and inner verticals brownish black but lighter near base; genal



bristle light brown; posterior upper fronto-orbitals white; postverticals and postoculars white but with pink near tips.

*Thorax:* Prescutum and scutum black with light gray pollinosity, covered with short, white setae, bristles light brown blending to black at tips; scutellum mahogany brown, cinereous dorsolaterally, with 2 pairs of prominent dark brown bristles; postscutellum white; postnotum black, covered with silvery white pollinosity except for a pair of black spots dorsolaterally; pleuron pinkish amber; legs and halter amber yellow; wing shining coal black blending to dark brown at extreme base and in anal cell and alula; a few widely scattered, very faint gray spots in cells br,  $r_{4+5}$ , and dm; a prominent round white spot at caudal margin of cell  $cua_1$ , lying adjacent to end of vein  $A_1CuA_2$ , 2 small angular white spots near base of cell  $cua_1$ , lying against vein  $CuA_2$ ; apical crescent white, extending from about midway between apices of veins  $R_{2+3}$  and  $R_{4+5}$  to about  $\frac{1}{3}$  the distance from vein M to vein  $CuA_1$ , the inner arc slightly flattened into almost a straight line and its posterior tip curving distally to wing margin.

*Abdomen:* Tergites and sternites red, the former evenly covered with small black setae and with slightly longer ones along posterior edge, 6th tergite with a pair of small black spots near lateral extremity and just caudad of 5th tergite; a row of 8–10 large dark brown spines on terminal margin of 6th tergite; oviscape dark amber, terminal margin narrowly black with 2 prominent setae.

Male.—Not known.

Body length.—Female 4.8 mm, including oviscape.

Type specimens.—Holotype, ♀, 4 mi. E. Davis Creek, Modoc Co., Calif., 25.VI.80,

G. Steck, ex stem tip galls on low-growing *Artemisia* sp. (USNM). Paratype, ♀, same data as holotype (USNM).

Discussion.—*Eutreta modocorum* resembles *E. diana* (Osten Sacken) and *E. divisa* Stoltzfus. It can be distinguished from *diana* by its almost total lack of small gray-white wing spots, the prominent white spot adjacent to the terminus of vein  $A_1+CuA_2$ , by the pink head, pinkish amber pleuron, and by the entirely amber-yellow legs. It differs from the male of *divisa* by its lack of two prominent white diagonal slash marks on the wing and from the female of *divisa* by the lack of small gray to white spots in cells  $r_1$  and  $r_{2+3}$ , by the prominent white spot adjacent to the terminus of vein  $A_1+CuA_2$ , and by the characteristic coloration of its head, pleuron, and legs.

The name *modocorum* honors the Modoc Indians, who inhabited the area that includes the type locality.

#### *Eutreta navajorum* Blanc, NEW SPECIES

Fig. 2

Diagnosis.—In profile, oral margin strongly produced; costal margin with light areas or spots; oviscape at least as long as last 2 tergites; setae of oral margin and lower postgena largely brown or black; apical wing crescent well developed in both sexes and reaching anteriorly beyond vein  $R_{2+3}$ ; light spots in wing disk small.

Female.—*Head:* Frons slightly wider than long, a faint, narrow pale white triangle straddling ocellar triangle posteriorly, its slender point extending anteriorly to frontal suture; face without spots, bearing antennal grooves from antennal bases to oral margin. Parafacials with silvery-white pollinosity extending up over fronto-orbital plate; orbito-antennal spot lacking; genal margin

Figs. 1–10. Right wings of Tephritidae. 1, *Eutreta modocorum*, female. 2, *E. navajorum*, female. 3, *Gymnocarena flava*, female. 4, *Trupanea viciniformis*, female. 5, *T. viciniformis*, male. 6, *Urophora claripennis*, female. 7, *U. setosa*, male. 8, *Valentibulla dodsoni*, female. 9, *V. dodsoni*, male. 10, *Xanthaciura chrysur*, female.

posterior to genal bristle with a row of 4-6 medium-sized black setae, occasionally with one or more white setae in this row; 3 pairs long black lower fronto-orbitals; anterior upper fronto-orbital long and black, posterior white, shorter, strongly reclinate; inner verticals long and black; about 12 thick, white postoculars; ocellars long, black, extending slightly antero-laterad.

*Thorax*: Dark brown; notum and pleuron with scattered short, white setae; halter light brown; postscutellum greyish white; postnotum brownish black with grey pollinosity centrally; legs concolorous with general body color, tarsi lighter brown. Wing dark brownish black with uniformly small, distinct, greyish white spots not coalescent, rather evenly distributed except lacking in an apical band adjacent to apical white crescent but extending to wing base and present on anal lobe and alula; apical white crescent as narrow as, or narrower than, subapical brown band and extending anteriorly just beyond vein  $R_{2+3}$  and posteriorly about  $\frac{1}{3}$  of distance from vein M to  $CuA_1$ ; costa without marginal spots beyond the area surrounding apex of vein  $R_1$ .

*Abdomen*: Dark brown; tergites and sternites with evenly distributed fine dark brown setae; oviscapae dark brownish black near base and apex, blending to mahogany brown in middle.

*Male*.—All head, body, leg, and wing characters essentially as in female, without any evident sexual dimorphism except for genital structures.

Type specimens.—Holotype, ♀, Sunnyside Cyn., Huachuca Mts., Cochise Co., Arizona, 9.VII.1940, D. E. Hardy (USNM). Allotype, ♂, same locality and date as holotype, R. H. Beamer (USNM). Paratypes, 26, all same locality and date as holotype: D. E. Hardy 8 ♂, 3 ♀; R. H. Beamer 6 ♂, 2 ♀; E. E. Kenaga 3 ♀; L. C. Kuitert 2 ♂; and L. J. Lipovsky 2 ♀. Depositories of paratypes: 14 ♂, 8 ♀ (USNM); 1 ♂, 1 ♀ (CAS); 1 ♂, 1 ♀ (FLB).

*Discussion*.—This species is similar to *E.*

*intermedia* Stoltzfus and runs to that species in Stoltzfus' key (1977). It can be readily distinguished from *intermedia* by its lack of an orbito-antennal black spot.

At the present time this species is not known except from the type locality. Its specific name is given in honor of the Navajo Indians of the southwestern United States.

### *Gymnocarena* Hering

*Spilographa* Loew: Aldrich (part), 1905: 604 (catalog).

*Euaresta* Loew: Aldrich (part), 1905: 612 (catalog).

*Oedicarena* Snow: Curran, 1934: 289 (in key), figs. 7, 30 (wing, head).

*Gymnocarena* Hering, 1940: 4 (type species, *Oedicarena diffusa* Snow, 1894, by orig. des.).—Foote, 1960a: 112 (review).—Foote, 1965: 675 (catalog).—Wasbauer, 1972: 117 (hosts).

Studies subsequent to the junior author's review of this genus (Foote, 1960a) showed that its species and those of *Mylogymnocarena* Foote were possibly congeneric. Many characters of the two genera are strikingly similar. In lateral view, the profile of the head is unusual in that the parafacial at the level of the antenna is quite wide, the face is receding, and the postgena is swollen, giving the head outline a slanted aspect with respect to the axis of the eye. Both genera are brown to yellow bristled without any important differences in the structure and placement of the setae except for the presence of certain femoral bristles in the species of *Gymnocarena* (see below). The body and wing structures are also quite similar. Both genera have a hairless frons, crossvein r-m is apical of the midpoint of the discal cell, and the dorsocentral bristles are in or very close to a line drawn between the supra-alars.

The recent discovery of an undescribed species resembling *tricolor* has focused our attention on this situation, and our detailed examination of the species of both genera

reveal several differences that distinguish two rather clear-cut groups:

*Gymnocarena*: Background color of wing disk completely or partly yellowish; cell  $r_1$  with 2 hyaline spots apicad of pterostigma; veins r-m and dm-cu nearly parallel; femora of all 3 legs somewhat enlarged, at their thickest part about 3× diameter of respective tibiae.

*Mylogymnocarena*: Background color of wing disk uniform brown, although it may fade to completely hyaline basally; cell  $r_1$  with only 1 hyaline area apicad of pterostigma; veins r-m and dm-cu lying at an angle to each other so that their posterior extensions converge at or near posterior wing margin; femora not markedly enlarged, at their greatest diameter not more than about 2× as thick as the respective tibiae.

The species of the two genera exhibit yet another distinguishing characteristic: Those of *Gymnocarena* occur below 3000 feet east of the Continental Divide, while those of *Mylogymnocarena* are found at relatively high altitudes in the western mountain chain of the North American continent.

KEY TO THE KNOWN SPECIES OF  
*Gymnocarena*

1. Background color of wing uniformly light yellow, the hyaline markings sometimes difficult to distinguish from it; apical-most hyaline mark in cells  $r_{2+3}$  and  $r_{4+5}$  joined across vein  $R_{4+5}$  ..... *diffusa* (Snow)
- Apical half of wing dark brown, basal half faded brown, sometimes yellowish brown; apical-most hyaline marks in cells  $r_{2+3}$  and  $r_{4+5}$  entirely separate, not at all joined across vein  $R_{4+5}$  ..... 2
2. Hyaline mark at apex of pterostigma ending above vein r-m; apical 1/2 of discal cell and all of vein r-m included in the dark brown area anterior to them; face concave, with a rather sharp central carina ..... *tricolor* (Doane)
- Hyaline mark at apex of pterostigma ending distinctly distad of anterior end of vein r-m; apical 1/2 of discal cell and posterior half of vein r-m lying in a yellowish area similar to that in basal half of wing; lower half of face swollen, clearly visible beyond parafacial in profile ..... *flava* Foote, new species

*Gymnocarena diffusa* (Snow)

*Oedicarena diffusa* Snow, 1894: 161 (lectotype female, Kansas).—Coquillett, 1899: 261 (taxonomy).—Snow, 1903: 219 (Kansas).—Curran, 1934: 290, fig. 30 (head).—Knowlton and Harmston, 1937: 145 (Utah).—Byers et al., 1962: 180 (type data).

*Straussia diffusa*: Coquillett, 1899: 261 (taxonomy).—Essig, 1938: 602 (note).

*Spilographa diffusa*: Aldrich, 1905: 604 (catalog).—Washburn, 1905: 118 (Minnesota).

*Strauzia diffusia* [error]: Cresson, 1907: 100 (New Mexico).

*Gymnocarena diffusa*: Hering, 1940: 4 (type data).—Foote, 1960a: 113 (review).—Foote, 1962: 174 (type designation).—Foote, 1965: 676 (in catalog).—Wasbauer, 1972: 117 (hosts).

A number of workers have contributed some interesting information about this species since 1970. Wasbauer (1972) and Hilgendorf and Goeden (1981) state that the species has been found associated with *Helianthus annuus* L. and possibly other *Helianthus* species; Beirne (1971) and Lipp and Schulz (1970) indicate that it may be of some economic importance on these hosts; and Kamali and Schulz (1971, 1973, 1974) present additional information on artificial diet, biology, and ecology, and a description of immature stages.

The outstanding characteristic of this species is the very pale yellow background color of the wing with which the hyaline spots contrast but little. Other important distinguishing characters are presented in the accompanying key.

*Gymnocarena tricolor* (Doane)

*Euaresta tricolor* Doane, 1899: 191 (lectotype male, South Dakota).—Huber, 1927: 48 (parasite).—Foote, 1966: 125 (type designation).

*Tephritis tricolor*: Coquillett, 1899: 264 (taxonomy).

*Gymnocarena tricolor*: Quisenberry, 1950: 10 (taxonomy).—Foote, 1960a: 113 (review).—Foote, 1965: 676 (in catalog).

Since one of us (Foote, 1960a) published his review, no additional information concerning this species has come to light. The synonymy given above includes a complete account of the literature. The characters distinguishing *tricolor* are presented in the discussion of the following species.

***Gymnocarena flava* Foote, NEW SPECIES**  
Fig. 3

**Diagnosis.**—A large, completely yellow species; all body bristles yellow; dorsocentral bristles in or very close to a line drawn through the supra-alars; frons bare; apical anterior quarter of wing disk dark brown, remainder yellowish; hyaline spot immediately apicad of pterostigma terminating posteriorly at a point apicad of end of vein r-m; apical hyaline spots on cells  $r_{4+5}$  and m not connected across vein M.

**Female.**—**Head:** In lateral view,  $0.8\times$  as wide as high; gena  $0.3\times$  as wide as height of eye; frons bare, rather bulbous immediately posterior to lunule,  $0.7\times$  as wide at vertex as long; antenna about  $0.6\times$  as long as face, 3rd antennal segment broadly rounded apically, only about  $1.2\times$  as long as greatest width; 3 pairs lower fronto-orbitals, 2 pairs upper fronto-orbitals, ocellars and verticals longer and stronger than other head bristles; postgena somewhat swollen, beset with numerous long, stout setae.

**Thorax:** Dorsocentrals in or near a line through supra-alars; 2–3 pairs anepisternals, 1 pair anepimerals, 1 pair katepisternals; 2 pairs scutellars; subscutellum and postnotum yellow; forefemur with 2 rows prominent dorsal setae, 1 row long antero-ventral setae; hindtibia with a row of short, evenly spaced setae. Apical anterior  $\frac{1}{4}$  of wing disk brown, contrasting rather strongly with yellow background color on basal portion of wing disk; the following hyaline spots present: 2 hyaline wedges in cell  $r_1$  immediately distad of pterostigma, both contin-

ued into cell  $r_{2+3}$ , the proximal wedge ending at a point distad of vein r-m; 4 rounded spots in a line, 1 each in cells  $r_{2+3}$  and  $r_{4+5}$  and 2 in cell m; cell m with 2 additional elongated spots; large round spot in cell  $r_{4+5}$  at anterior terminus of vein dm-cu; other discal spots with indistinct borders in proximal  $\frac{1}{2}$  of wing; proximal yellowish coloration of disk invading distal  $\frac{1}{4}$  of discal cell, proximal  $\frac{1}{4}$  of cell m, and enclosing lower  $\frac{1}{2}$  of vein r-m.

**Abdomen:** Entirely yellow; oviscape about  $1.1\times$  as long as preceding 2 segments combined.

**Male.**—All head, body, and leg characters essentially as in female, without any evident sexual dimorphism except for genital structures. Hyaline wedges distad of stigma tend to coalesce in cell  $r_{2+3}$ , and an additional small hyaline spot present in cell  $r_{4+5}$ .

**Type specimens.**—Holotype, ♀, Kalsow Prairie, Manson, Iowa, 3.VII.1973, W. Bryan Stoltzfus (USNM). Paratypes: 1 ♂, same data as holotype (ISU); 1 ♂, 2 mi. s. Ames, Iowa, along railroad, 7.VII.1973, W. Bryan Stoltzfus (USNM); 1 ♀, same data except 4.VII.1973 (ISU).

**Discussion.**—*Gymnocarena flava* most closely resembles *tricolor* in wing pattern; in both species the basal 0.75 of the wing disk is yellowish in contrast to the dark brown background color of the anterior distal quarter. In this respect, both these species differ from *diffusa*, in which the background color is an evenly distributed light yellow color throughout. *Gymnocarena flava* is most readily distinguished from *tricolor* by the characters presented in the accompanying key. Nothing is known about the hosts of either *flava* or *tricolor*.

***Mylogymnocarena* Foote**

*Mylogymnocarena* Foote, 1960a: 111 (type species, *Urellia apicata* Thomas, 1914, by orig. des.).—Foote, 1965: 669 (in catalog).

The characters distinguishing this genus and *Gymnocarena* are given in the discus-

sion of the latter. To date no new information has been forthcoming concerning the relatively rare species which comprise this genus. Our recent study of structural characters shows that *Gymnocarena bicolor* Foote more closely resembles *M. apicata* than *G. diffusa* (Snow); *bicolor* is here transferred to *Mylogymnocarena*. The following key will serve to distinguish the two known species of the latter genus.

#### KEY TO THE KNOWN SPECIES OF

#### MYLOGYMNOCARENA

- Dark area of wing confined to apical  $\frac{1}{2}$  of wing disk; pterostigma slightly yellowed; cell  $r_{2+3}$  with 2 hyaline spots apicad of terminus of vein  $R_{2+3}$ ; cell m with at least 3 hyaline spots ..... *apicata* (Thomas)
- Apical  $\frac{2}{3}$  of wing disk, including part of pterostigma, with dark marking; cell  $r_{2+3}$  completely dark apicad of terminus of vein  $R_{2+3}$ ; cell m with 1 large hyaline spot which sometimes contains a small dark central area ..... *bicolor* (Foote)

#### *Mylogymnocarena apicata* (Thomas)

*Urellia apicata* Thomas, 1914: 428 (holotype female, Colorado).

*Mylogymnocarena apicata*: Foote, 1960a: 111 (review).—Foote, 1965: 669 (in catalog).

In addition to the holotype, the only other specimen we have seen was collected at Tepalcates, 30 mi. w. Durango, Durango, Mexico, 8400 ft., 4-8.XII.1972 by Powers, Viers, and McNeill at "black and white lights." A very small fourth hyaline spot present in cell m is the only character we could find that distinguishes this specimen from the holotype.

#### *Mylogymnocarena bicolor* (Foote),

#### NEW COMBINATION

*Gymnocarena bicolor* Foote, 1960a: 113 (holotype male, Indian Creek Canyon, Chiricahua Mts., Ariz.).—Foote, 1965: 676 (in catalog).

Structurally, *apicata* and *bicolor* are so similar that they can be distinguished easily only by their respective wing patterns.

This species was described from a single male caught at an altitude of 6100 ft. in Arizona. Since then, we have seen an additional male captured 5 mi. nw. of Colonia Juarez, Chihuahua, Mexico, at 5000 ft. elevation by G. S. Forbes 24.VIII.1979. Its wing pattern agrees in all respects with that of the holotype except for the lack of a dark spot at the center of the large hyaline area in cell m.

We have also seen a Mexican male resembling *bicolor* from Hwy. 40, 6.5 mi. e. Potrerillos, Sinaloa, collected 21.VIII.1964 by E. I. Schlinger. The wing pattern differs from that of *bicolor* in having less well defined hyaline markings in cells  $r_1, r_{2+3}$ , and m; it may represent yet a third species of *Mylogymnocarena*.

#### *Metatephritis* Foote

*Metatephritis* Foote, 1960a: 110 (type species, *fenestrata* Foote, 1960a: 110, by orig. des.).

To date this genus has been represented only by three Wyoming males of the sole species, *fenestrata* Foote (Foote, 1960a: 110). The genus is distinctly tephritine and in all characters but the wing pattern it resembles most closely the species of *Neotephritis* and *Euaestoides* in size, habitus, and setal distribution.

Gary Steck, formerly University of Texas, Austin, reared an additional male of *fenestrata* at Plum Valley Camp Ground, Warren Mts., Modoc Co., California, 25.VI.1980 from small stem-tip galls on a low-growing *Artemisia* species, the only additional record we have seen of this rare, unusual species. The wing pattern of this California specimen differs from that of the holotype illustrated by Foote (1960a: 108, fig. 2) in that a round hyaline spot is present at the center of the anal lobe contiguous with the posterior wing margin; another round hyaline spot is centered on the posterior margin of cell  $cua_1$  between the termination of vein  $CuA_1$  and the next proximal hyaline

area; and the latter is wider, occupying more of the posterior proximal half of cell  $cu_{a1}$ .

*Metatephritis* may be accommodated in the existing key to the genera of California Tephritidae (Foote and Blanc, 1963: 6) with the following emendation:

30a(20)	Wing disk almost completely brown-bordered, leaving large central hyaline area occupying cells $r_{4+5}$ , and discal cell . . . . .	<i>Metatephritis</i> Foote
-	Wing pattern otherwise . . . . .	31
31(30a)	. . . . .	

### *Paroxyna* Hendel

*Paroxyna* Hendel, 1927: 146 (type species, *Trypeta tessellata* Loew, by original designation).

Until the appearance of Novak's revision of this genus (Novak, 1974), there had been no means of distinguishing among the 15 or so known species occurring in the United States and Canada. Nine species were added by Novak in 1974. A new synonymy in this widespread genus is recorded herewith.

### *Paroxyna genalis* (Thomson)

*Trypeta genalis* Thomson, 1869: 585 (syn-types male, female; California).

*Paroxyna difficilis americana* Hering, 1944: 11 (holotype male; So. Fork, Rio Grande R., Colo.). **NEW SYNONYMY.**

As a result of studying a large number of specimens of *P. genalis* and *P. americana* collected at numerous localities in the western United States, we conclude that these two forms are conspecific. The characters most often used to separate them are 1) the presence or absence of small hyaline spots in the black area of cell  $r_1$  below the pterostigma, 2) the size of the hyaline spots in cell  $r_{4+5}$ , 3) the presence or absence of 2 dark bands across cells  $dm$  and  $cu_{a1}$ , and 4) whether the scutum is striped (with gray and brown) or is brown without stripes. The three wing characters have been observed in all degrees of intergradation, some individuals exhibiting the character for "*americana*" on

one wing while possessing the "*genalis*" character on the other. The stripeless character of the scutum, which is recorded as occurring in only part of the "*americana*" population, also shows all degrees of intergradation from long prominent stripes, through faint short anterior stripes, to a totally brown or golden brown pronotum. Studies of genitalia by Novak (1974) show no definitive differences, and biological data are too inadequate to substantiate the species separation.

### *Trupanea* Schrank

*Trupanea* Guettard, 1762: 171 (unavailable name, author not binominal).

*Trupanea* Schrank, 1795: 147 (type species, *Trupanea radiata* Schrank, 1795: 147 by monotypy) (= *stellata* Fuessly).

No species of *Trupanea* occurring in America north of Mexico have been described since the junior author revised the genus (Foote, 1960b). The distinctive species described here is of interest because of its morphological characteristics and because it was collected from two host plants never before recorded for the genus.

### *Trupanea viciniformis* Foote,

#### NEW SPECIES

Figs. 4, 5

**Diagnosis.**—Small species, length of wing about 2.25 mm; head quadrangular in profile, only slightly higher than long; thorax and abdomen gray tomentose without other distinguishing marks; oviscapae shining black, about  $2 \times$  as long as terminal abdominal tergum; no dark ray through discal cell to posterior wing margin; apical 0.25 of cell  $br$  with broad infuscation which fades into proximal hyaline area; hyaline mark at apex of pterostigma lying at an oblique angle to horizontal wing axis.

**Female.**—**Head:** Ground color brownish yellow; frons partially gray tomentose, length from vertex to lunule about equal to width between eyes at vertex; in profile quadrangular.



gular, only slightly higher than long; gena about  $0.2\times$  as high as eye; genal bristle inconspicuous; oral margin projecting markedly forward under antenna; 3rd antennal segment about  $0.3\times$  as long as head height, arista yellow.

*Thorax:* Ground color of scutum and scutellum shining black but densely gray tomentose, covered with thickened whitish setulae about as long as distance between their bases; ground color of pleural sclerites yellow, densely gray tomentose; postscutellum and metanotum more densely gray tomentose. Wing about 2.25 mm long; pattern (Fig. 4) with usual *Trupanea* configuration, a complete dark bar through pterostigma with an indistinct proximal border, fusing completely with a completely dark area occupying apical 0.25 of cell br, the latter also gradually fading into the adjacent proximal hyaline area; hyaline mark at apex of pterostigma extending into cell  $r_{2+3}$  but strongly constricted where it crosses vein  $R_{2+3}$  and proximad of that point; stem of dark Y-shaped mark in apex of cell  $r_{4+5}$  with a thickened stem; apex of discal cell with brown borders lying on veins dm-cu and M but no dark bar crossing the disk of that cell. Legs yellow, without distinguishing characteristics.

*Abdomen:* Tergites dark gray tomentose without other distinguishing marks; oviscapae shining black, about  $2\times$  as long as terminal tergite.

Male.—Wing pattern (Fig. 5) much as in female except apical Y-shaped mark in cell  $r_{4+5}$  with a slender stem connecting it with the large preapical dark area of wing disk; hyaline mark at apex of pterostigma not constricted at vein  $R_{2+3}$ . Other characters as in female except for postabdomen.

Type specimens.—Holotype, ♀, Texas A&M Ranch, 15 mi. wsw. Uvalde, Maverick Co., Texas, 1.IX.1976, D-Vac, *Xanthocephalum sarothrae*, Robbins and Seedle (USNM). Allotype, ♂, same data as holotype except 13.X.1976, sweeping (same host)

(USNM). Paratypes: 3 ♀, Hwy. 57, 9 mi. w. LaPryor, Chaparrosa Ranch, Zavala Co., Texas, 2.IX.1976, D-Vac, *Ericameria austrotexana* Robbins and Seedle (2, USNM; 1, FLB).

Discussion.—*Trupanea vicinaformis* resembles *vicina* (Wulp) in many ways but has no dark bar running into or through the disk of the discal cell, the hyaline bar at the apex of the pterostigma is more oblique with respect to the longitudinal axis of the wing, and the proximal borders of the dark bar running through the pterostigma and the dark area in the apex of cell br both blend gradually into the next adjacent proximal hyaline area.

This species is named to reflect its very close affinities to *T. vicina*. The host data presented above unfortunately do not necessarily reflect the true host of this species, which is not known.

#### *Urophora* Robineau-Desvoidy

*Euribia* Meigen, 1800: 36 (type species, *Musca cardui* Linnaeus, 1758: 600, by des. Hendel, 1927: 41. Suppressed by ICZN 1963: 339).

*Urophora* Robineau-Desvoidy, 1830: 769 (type species, *Musca cardui* Linnaeus, 1758: 600, by des. Westwood, 1840: 149).

The genus *Urophora* comprises well over 100 species distributed mainly in the Palearctic, Nearctic, and Neotropical regions. A few species have been reported from Africa, and one is known from the Oriental Region. The genus is unique among the Tephritidae in that vein  $CuA_2$  encloses cell cup transversely without any kind of angular extension along vein  $A_1 + CuA_2$ . Some of the American species may well be more closely related to other tephritid genera, but detailed studies of these possible relationships are so far lacking.

Steyskal has ably reviewed the Palearctic and New World species in his pictorial key (1979). The two species described in this

paper are the first to be discovered since that date.

*Urophora claripennis* Foote,

NEW SPECIES

Fig. 6

Diagnosis.—Wing disk without dark markings except for a moderate brownish clouding in pterostigma in some specimens; none of the veins pigmented; pterostigma less than  $\frac{1}{2}$  as wide as long; legs entirely yellow; pleuron and scutellum black, distinctly tomentose.

Female.—*Head*: In profile, higher than long, ratio of height to length 1.3:1; frontofacial angle  $110^\circ$ , junction of face and frons not particularly angulate; face retreating, oral margin not projecting anteriorly; eye broad-oval; gena wide, about  $0.6 \times$  as wide as eye height; mouthparts geniculate, about  $0.8 \times$  as long as head; frons nearly parallel-sided, about  $1.2 \times$  as wide at vertex as length from vertex to lunule; antenna about  $\frac{2}{3}$  as long as face, arista light at base, dark apically; occiput tomentose black, remaining portions of head amber colored; all head bristles black.

*Thorax*: Ground color of pleuron, scutum, scutellum, subscutellum, and postnotum evenly black without any distinctive markings but evenly and densely tomentose with a slight golden cast; dorsocentrals at level of supra-alars; 1 pair katapisternals, 1 pair anepimerals; scutal setulae black, slender, individually about as long as intersetal distances; all thoracic bristles slender, black; halter amber colored. All coxae brownish black basally, remainder of coxae and all legs entirely yellow; mid- and hindfemora and tibiae without any outstanding bristles, either singly or in rows. Wing disk transparent (Fig. 6), color pattern completely absent except for a very light brown clouding in apical  $\frac{1}{2}$  of pterostigma in some specimens; all veins yellowish; pterostigma less than  $\frac{1}{2}$  as wide as long; vein r-m situated very slightly distad of middle of discal cell.

*Abdomen*: Ground color of tergites black,

subshining, with light blackish tomentum; oviscape shining black, slender, as long as or longer than abdomen, beset with slender black setulae dorsally and ventrally.

Male.—Not known.

Type material.—Holotype ♀, Cameron Co., Texas, 8.III.1928, J. G. Shaw (USNM). Paratypes: 2 ♀, same data as holotype (USNM); 1 ♀, Brazoria Co., Texas, 10.III.1928, R. H. Beamer (UK).

Discussion.—Among the *Urophora* occurring in America north of Mexico, the only species without a pattern of dark discal stripes or spots are *timberlakei* Blanc and Foote and *claripennis*. Contrasting to the new species described here, in *timberlakei* the femora are largely black, the pleuron and scutellum are shining black rather than tomentose, the pterostigma is marked more darkly and is shorter than half its width, some of the veins are brown, and the black oviscape is shorter than the abdomen.

*Urophora setosa* Foote,

NEW SPECIES

Fig. 7

Diagnosis.—Wing with extensive pattern of transverse stripes, crossveins lying in dark bands; scutellum entirely black; at least basal halves of all femora black; scutum lightly tomentose with numerous short, upstanding bristles in addition to acrostichals and dorsocentrals; parafacial about as wide as 3rd antennal segment; anterior  $\frac{1}{2}$  of frons amber, posterior  $\frac{1}{2}$  black, the line of demarcation between these 2 colors sharp.

Male.—*Head*: In profile, head squarish, about as long as high; oral margin moderately and bluntly projecting anteriorly; eye broad oval; gena  $0.4 \times$  as wide as eye height; parafacial as wide as 3rd antennal segment; fronto-facial angle about  $100^\circ$ ; mouthparts geniculate, about as long as head length; frons between eyes parallel-sided, about as wide as distance from vertex to lunule; anterior  $\frac{1}{2}$  of frons, first 2 antennal segments, face, parafacial, and gena amber colored, remainder of head black; antenna about  $\frac{2}{3}$

as long as face, 3rd segment brownish black, arista amber at base, black apically; all head bristles shining black.

**Thorax:** Pleuron glistening black; humerus and transverse and scutoscutellar sutures glistening black, remainder of scutum black with coarse blackish tomentum which appears somewhat silvery when viewed from behind; about 20 short, black bristles scattered from anterior portion of scutum to acrostichals; dorsocentrals comparatively short; scutellum, subscutellum, and postnotum shining black; 2 pairs scutellars; 2 pairs katapisternals, 1 pair anepimerals; dorsocentrals situated about halfway between transverse suture and supra-alar; all thoracic bristles black; haltere amber. Each coxa with a touch of silvery tomentum; basal  $\frac{2}{3}$  of femora black, remainder of legs amber; 4th and 5th tarsomeres of all legs slightly darker than preceding ones. Wing disk (Fig. 7) colorless with the following brownish-black marks: brown spot with indistinct borders at extreme base of wing; 1 narrow transverse band at level of bm-cu extending from vein R<sub>1</sub> to vein A, CuA<sub>2</sub>; irregular band from costa through pterostigma and vein r-m to middle of cell cu<sub>1</sub>; dark mark in cells r<sub>2+3</sub> and r<sub>4+5</sub> immediately distad of pterostigma; irregular transverse band from costa at apex of cell r<sub>2+3</sub> through vein dm-cu to posterior wing margin; quadrate spot filling apex of cell r<sub>4+5</sub> with a slightly lighter circular area at its center; vein r-m situated at middle of discal cell.

**Abdomen:** Entire surface subshining black with slight black tomentum; tergites 1 and 2 apparently fused and together about as long as tergites 3 and 4 together; tergite 5 about  $\frac{1}{2}$  as long as tergites 3 and 4 together; protandrium and remainder of visible postabdomen black.

Female.—Not known.

Type material.—Holotype  $\delta$ , Tar Canyon, Kings Co., California, 4.IV.1979, A. J. Gilbert and A. Bookout (USNM).

Discussion.—Two characters combine to make this very distinctive among American

species of *Urophora*: the numerous short upstanding scutal setae (for which the species is named) and the half-amber, half-black frons with a distinct line of demarcation between the two colors. In Steyskal's (1979) key to American species, *setosa* runs to *ba-jae* Steyskal, from which it is easily separated by the presence of the two characters discussed above. From the other species with an entirely black scutellum occurring in America north of Mexico it is distinguished also by details of the wing pattern.

#### *Valentibulla* Foote and Blanc

*Valentibulla* Foote and Blanc, 1959: 149 (type species, *Trypeta californica* Coquillett, 1894: 73, by orig. des.).—Foote and Blanc, 1963: 91 (review, California).—Foote, 1965: 670 (in N.A. catalog).—Wasbauer, 1972: 142 (hosts).—Steyskal and Foote, 1977: 154 (key, known species).—Foote and Blanc, 1979: 175 (taxonomy).

This genus was originally proposed by Foote and Blanc (1959) for three quite distinctive species, *munda* (Coquillett), *californica* (Coquillett), and *thurmanae* Foote; in the same paper, *Euaresta mundula* Coquillett was synonymized with *californica*. Steyskal and Foote (1977) indicated that the species described as *munda* by Foote and Blanc (1959) was actually an undescribed species, and Foote renamed that species *steyskali*. Foote added *C. mundulata* to the genus in 1979 (Foote and Blanc, 1979), and yet another species, collected in New Mexico, is added here.

#### *Valentibulla dodsoni* Foote,

##### NEW SPECIES

Figs. 8, 9

Diagnosis.—Scutum dark brownish gray tomentose, thickly set with expanded yellowish white setulae; hyaline incisions in cell m much wider than intervening dark areas; cell r<sub>1</sub> with only 2 hyaline costal incisions apicad of pterostigma, a 3rd (apical) spot entirely lacking; legs entirely yellow;

apical Y-shaped mark in cell  $r_{4+5}$  with anterior arm much shorter than posterior arm, causing the hyaline area between them to lie at an angle to vein  $r_{4+5}$ .

Female.—*Head*: Frons, face, and gena yellow; in profile,  $1.5 \times$  as high as long; frons meeting face at about  $110^\circ$ ; eye  $0.8 \times$  as high as head, the gena rather wide, genal bristle yellowish white; parafacial nearly as wide as 3rd antennal segment at its widest point; lower 0.3 of face barely visible in profile beyond parafacial; frons quadrangular, nearly as wide at vertex as length from vertex to antennal base; lunule about  $0.6 \times$  as long as wide; numerous prominent yellowish white setulae on apical  $\frac{2}{3}$  of frons; antenna about  $0.6 \times$  as long as face, 3rd segment broadly rounded apically, basal  $\frac{1}{2}$  of arista yellow, apical  $\frac{1}{2}$  black.

*Thorax*: Scutum heavily tomentose, dark gray to dark brown, thickly set with yellowish white setulae; pleural sclerites also heavily tomentose, dorsal  $\frac{1}{2}$  of pleuron yellow, including humerus and posterior  $\frac{1}{2}$  of notopleuron, katapisternum and ventral halves of anepimeron and anepisternum dark brownish gray; sternum yellow; scutellum, subscutellum and postnotum concolorous with scutum, but apical margin of scutellum narrowly rimmed with yellow. Wing about 3.2 mm long, pattern (Fig. 8) of hyaline marks highly contrasting with a very dark brown ground color; 2 hyaline areas, 1 at each end of cell c; pterostigma completely dark, almost  $3 \times$  as long as greatest width; 2 hyaline spots completely crossing proximal 0.6 of cell  $r_1$ , the proximal-most continued into cell  $r_{2+3}$  across vein  $R_{2+3}$ , apex of cell  $r_1$  completely dark; large, prominent bulla present in cell  $r_{4+5}$ ; anterior arm of Y-shaped mark in apex of cell  $r_{4+5}$  distinctly shorter than posterior arm, causing the intervening hyaline area to lie at a distinct angle to vein  $R_{4+5}$ ; the 2 proximal hyaline spots in cell m partly or wholly coalesced, in latter case appearing as a very large single spot of 2 in that cell; cell  $cua_1$  and anal lobe almost entirely hyaline. Legs

entirely yellow, without distinguishing characteristics.

*Abdomen*: Tergites and oviscape subshining black; sternites black, lightly tomentose; tergites and apical 0.3 of oviscape sparsely set with short, slender, transparent setulae; oviscape thickened at base in lateral view, about  $1.1 \times$  as long as 2 apical tergites together.

Male.—Wing pattern (Fig. 9) much as in female except anterior arm of Y-shaped mark in cell  $R_{4+5}$  distinctly narrower than posterior arm, tapering from base and disappearing, or nearly so, at junction of costa and vein  $R_{4+5}$ , the apical-most hyaline spot in cell  $r_{2+3}$  rarely if ever crossing vein  $R_{4+5}$ . Other characters as in female except for those of postabdomen.

Type specimens.—Holotype, ♀, Jemez Valley, Sandoval Co., New Mexico, on *Chrysothamnus nauseosus* ssp. *bigelovii*, 14.V.1982, G. Dodson (USNM). Allotype, ♂ (USNM) and all paratypes same data (1 ♀, FLB; 1 ♂, GD; 1 ♂, USNM).

Discussion.—*Valentibulla dodsoni* is a distinctive member of the genus, lacking an apical spot in cell  $r_{2+3}$  and having an oblique apical spot in cell  $r_{3+5}$ . The posterior third of the wing is largely hyaline.

The species is named for Mr. Gary Dodson, Department of Biology, University of New Mexico, Albuquerque, who collected the first known specimens.

The key to the known species of *Valentibulla* presented by Steyskal and Foote (1977) may be amended to admit *dodsoni* as follows:

- 7(8) Legs, especially middle and hind ones, with femora and tibiae largely blackish .....  
     ..... *munda* (Coquillett)  
 — Legs usually wholly yellowish ..... 8  
 8(7) Cell  $r_{2+3}$  with 3 hyaline incisions apical of pterostigma; anterior arm of Y-shaped mark in cell  $r_{4+5}$  as long as posterior arm .....  
     ..... *californica* (Coquillett)  
 — Cell  $r_{2+3}$  with only 2 hyaline incisions apical of pterostigma; anterior arm of Y-shaped mark in apex of cell  $R_{4+5}$  distinctly shorter than posterior arm *dodsoni* Foote, new species

### *Xanthaciura* Hendel

*Xanthaciura* Hendel, 1914a: 86 (1914b: 45).

Type species, *Trypeta chrysur* Thomson (orig. des.).

A distinctive genus comprising about 16 quite similar species restricted to the New World, *Xanthaciura* can be recognized by the presence of a very dark, relatively narrow wing having two very prominent hyaline triangles based on the costa just distad of the pterostigma (Fig. 11) in addition to other, rounded discal markings and rather extensive hyaline areas along the posterior wing border.

A fourth species of this genus is here noted as occurring in North America north of Mexico.

### *Xanthaciura chrysur* (Thomson)

Fig. 10

*Trypeta chrysur* Thomson, 1869: 580 (Guanabara, Rio de Janeiro, Brazil).—Aczél, 1950: 128 (taxonomy).—Aczél, 1952: 255 (taxonomy).—Foote, 1967: 57, 65 (in catalog).

The first species of this genus to be known from North America, *insecta*, was described by Loew in 1862. About 60 years later, Phillips (1923) added a second species from Columbia, Missouri (*tetraspina* Phillips), and later, Benjamin (1934) described *connexionis* from Florida. Still later, the junior author (Foote, 1967) noted that *chrysur*, a South American species and type of the genus, was mentioned by Aczél (1952) as occurring in Florida. This name was involuntarily omitted from the catalog of North American Diptera (1965), and the reported presence of this species has largely been ignored since that time.

Aczél (1952) indicated he had examined a female of *chrysur* with the following data: "Noronia, Florida, Dec. 9, 1939, R. M. Graham, on orange tree." Recently, we have seen a series of four males and two females collected and presented to the USNMNH by Carl Stegmaier, labeled as follows:

"Homestead Air Force Base, Homestead, Florida, Nov. 23, 1970, reared from flowers of *Mikania* sp. (hempvine)." In addition to these two Florida localities, *chrysur* is known to occur from Central America south to Brazil, but it has not been recognized to date from the southwestern United States, Mexico, or the Caribbean area.

Among the North American species of *Xanthaciura* with only one pair of scutellar bristles, *chrysur* most closely resembles the widespread *insecta* (Loew), from which it may be separated by its entirely black pleural sclerites and the nature of some of the hyaline markings along the posterior border of the wing (Fig. 10). In *insecta*, the apical-most hyaline marking in cell  $cu_{a1}$  crosses vein  $CuA_1$  and extends anteriorly into the extreme posterior apical corner of the discal cell, while in *chrysur*, almost the entire apical posterior quarter of the discal cell is filled by the invasion of two entirely coalesced hyaline areas in this region.

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