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SCOLIIDAE (HYMENOPTERA) OF THE LOWER RÍO GRANDE VALLEY[1]

CHARLES C. PORTER[2]

ABSTRACT

The Lower Río Grande Valley scoliid fauna includes 5 species: the aestivally common *Trielis octomaculata texensis* (Saussure), *Campsomeris tolteca* (Saussure), which abounds throughout the year, and the sporadically encountered *Campsomeris completa* Rohwer, *C. hesterae* Rohwer, and *C. ephippium* (Say). The *Trielis* seems to be of old Sonoran origin, while the *Campsomeris* are Neotropic species, some of which invade Sonoran habitats. Valley populations of *T. octomaculata* and *C. tolteca* differ in phaenology, activity temperatures, flower selection, and habitat preference. *Campsomeris hesterae* has not been recorded previously from the United States.

RESUMEN

Cinco especies de Scoliidae habitan el Valle del Bajo Río Grande en el sur de Texas: *Trielis octomaculata texensis* (Saussure), *Campsomeris tolteca* (Saussure), *C. completa* Rohwer, *C. hesterae* Rohwer y *C. ephippium* (Say). *Trielis* se encuentra con frecuencia durante el verano. *Campsomeris tolteca* abunda en todos los meses del año. Las otras especies de *Campsomeris* aparecen sólo esporádicamente. *Trielis octomaculata* parece pertenecer a una estirpe sonorense muy antigua. Las especies de *Campsomeris* son neotropicales o neotropicales y sonorenses. Entre las poblaciones estudiadas de *T.*

[1]Contribution No. 520, Bureau of Entomology, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Gainesville, FL 32602.

[2]Research Associate, Florida State Collection of Arthropods; Biology Department, Fordham University, Bronx, NY 10458 USA.

octomaculata y de *C. tolteca*, pueden apreciarse diferencias ecológicas, en factores, tales como fenología, preferencias térmicas, flores visitadas, y microambientes preferidos. *Campsomeris hesterae* es citada por primera vez para los Estados Unidos.

Scoliids differ from other aculeate Hymenoptera by their longitudinally wrinkled distal wing membrane, 3-spined ♂ hypopygidium, and broad meso-metasternal plate that projects over the bases of the mid and hind coxae. They are large, hirsute, brightly patterned wasps. They often show striking sexual dimorphism. Female scoliids spend much time underground in search of rhizophagous scarabaeid grubs, which they attack ectoparasitically. Both sexes avidly consume nectar, and different sympatric and synchronous taxa diverge at least partially in floral selection.

Scoliids become most diverse in the tropics and subtropics. There they invade many habitats from wet forests to desert and attain at least 3000 m altitude. The North American scoliid fauna, consequently, is marginal. It derives from Neotropic and Sonoran stocks. Four Lower Río Grande Valley Scoliidae are Neotropic and 1 is Sonoran. All Valley species occupy extensive distributions, but 2 of the Neotropic species reach their northern limit in Hidalgo County, Texas.

Key to South Texas Scoliidae
(Male of *Campsomeris completa* unknown)

1. Fore wing with 3 submarginal cells; ♀ head and mesosoma broadly reddish; ♂ 1st gastric tergite often marked with much red in addition to black and yellow ..... 1. *Trielis octomaculata texensis* (Saussure)

1′. Fore wing with 2 submarginal cells; ♀ head and mesosoma without reddish ground color; ♂ 1st gastric tergite black or black and yellow 2

2(1′). Females (12 antennal segments; last gastric sternite without a triad of apical spines) 3

2′. Males (13 antennal segments; last gastric sternite with a triad of conspicuously projecting apical spines) 6

3(2). Hind face of propodeum with dense, coarse punctation; longer hind tibial spur acute at apex; wings uniformly black with metallic reflections; gaster black with tergites 2 and 3 mostly orange; body length about 40 mm ..... 5. *Campsomeris ephippium* (Say)

3′. Hind face of propodeum largely smooth and impunctate; apex of longer hind tibial spur varying from acute to spatulate; wings dusky or brownish with variably extensive and conspicuous hyaline areas; gaster marked with orange or yellow on at least 3 tergites; body length usually under 25 mm 4

4(3′). Pygidium with rather short, brownish black bristles; radial and 1st submarginal cells largely glabrous, setose only anteriad; hind tibial spurs dark brown, the longer spur a little spatulate at apex; pronotum and mesoscutum with white pubescence; pale areas of 2nd and 3rd gastric tergites mostly

orange; legs black ..... 2. *Campsomeris tolteca* (Saussure)

4′. Pygidium with long, reddish or golden brown bristles; radial and 1st submarginal cells setose throughout; hind tibial spurs whitish, the longer spur acute or rounded-off at apex; pronotum and mesoscutum with ferruginous or dull golden pubescence; pale areas of 2nd and 3rd gastric tergites yellow; tarsi, and often also tibiae, brown or ferruginous 5

5(4′). Clypeus in great part coarsely wrinkled; large punctures on propodeal dorsum mostly adjacent; basal, 2nd submarginal, and 1st discoidal cells extensively and conspicuously setose; no yellow on mesosoma; gastric sternites without yellow pattern; tibiae blackish and tarsi brown ..... 3. *Campsomeris completa* Rohwer

5′. Clypeus broadly smooth and shining, especially mesad; large punctures on propodeal dorsum with conspicuous smooth interspaces; basal, 2nd submarginal, and 1st discoidal cells mostly glabrous, except for a few long, peripheral setae; pronotum, scutellum, and postscutellum; gastric sternites 2 and 3 with yellow markings; tibiae and tarsi reddish brown ..... 4. *Campsomeris hesterae* Rohwer

6(2′). Vestiture black; wings black with metallic reflections; hind tibial spurs black; gaster black with tergites 2 and 3 mostly orange; 4th gastric sternite with an apical or apico-median zone of fine, dense punctures that emit erect silky setae ..... 5. *Campsomeris ephippium* (Say)

6′. Vestiture mostly pale; wings nearly hyaline; hind tibial spurs white; gaster black with yellow bands on 3 or 4 tergites; 4th gastric sternite without an apical area of fine and dense setiferous punctures 7

7(6′). Fore wing uniformly setose; vestiture of front, vertex, and thoracic dorsum yellowish; legs more or less extensively reddish brown ..... 4. *Campsomeris hesterae* Rohwer

7′. Fore wing becoming prominently setose only on anterior 1/3 and no farther distad than radial cell; vestiture mostly white, never yellow; legs black with yellow markings ..... 2. *Campsomeris tolteca* (Saussure)

Material Studied

1. *Trielis octomaculata texensis* (Saussure) (Fig. 1, 5)

Specimens Examined. 70 ♀ and 87 ♂: Texas, Hidalgo County, Bentsen Río Grande Valley State Park, 1 ♂, 9-VII-1980, 1 ♂, 11-VII-1980, 1 ♀, 1 ♂, 14-VII-1980, 1 ♀, 1 ♂, 16-VII-1980, 1 ♂, 18-VII-1980, 1 ♀, 1 ♂, 21-VII-1980, 1 ♀, 1-VIII-1980, 1 ♂, 20-VIII-1980, 1 ♀, 1 ♂, 21-VIII-1980, 1 ♀, 26-VIII-1980, 1 ♀, 27-VIII-1980, 1 ♀, 28-VIII-1980, 2 ♂, 20-XI-1977; McAllen Botanical Gardens at McAllen, 2 ♀, 2 ♂, 16-V-1974, 1 ♂, 28-V-1975, 4 ♂, 1-VI-1973, 4 ♀, 1-VI-1976, 1 ♂, 3-VI-1973, 1 ♂, 5-VI-1975, 2 ♂, 7-VI-1975, 1 ♂, 7-VI-1976, 2 ♂, 8-VI-1973, 1 ♂, 9-VI-1973, 1 ♀, 7 ♂, 10-VI-1973, 2 ♂, 11-VI-1973, 1 ♀, 11-VI-1977, 3 ♂, 12-VI-1973, 2 ♀, 1 ♂, 12-VI-1977, 3 ♀, 3-VII-1980, 4 ♀, 4-VII-1980, 3 ♀, 5-VII-1980, 3 ♀, 6-VII-1980, 1 ♀, 1 ♂, 2-VIII-

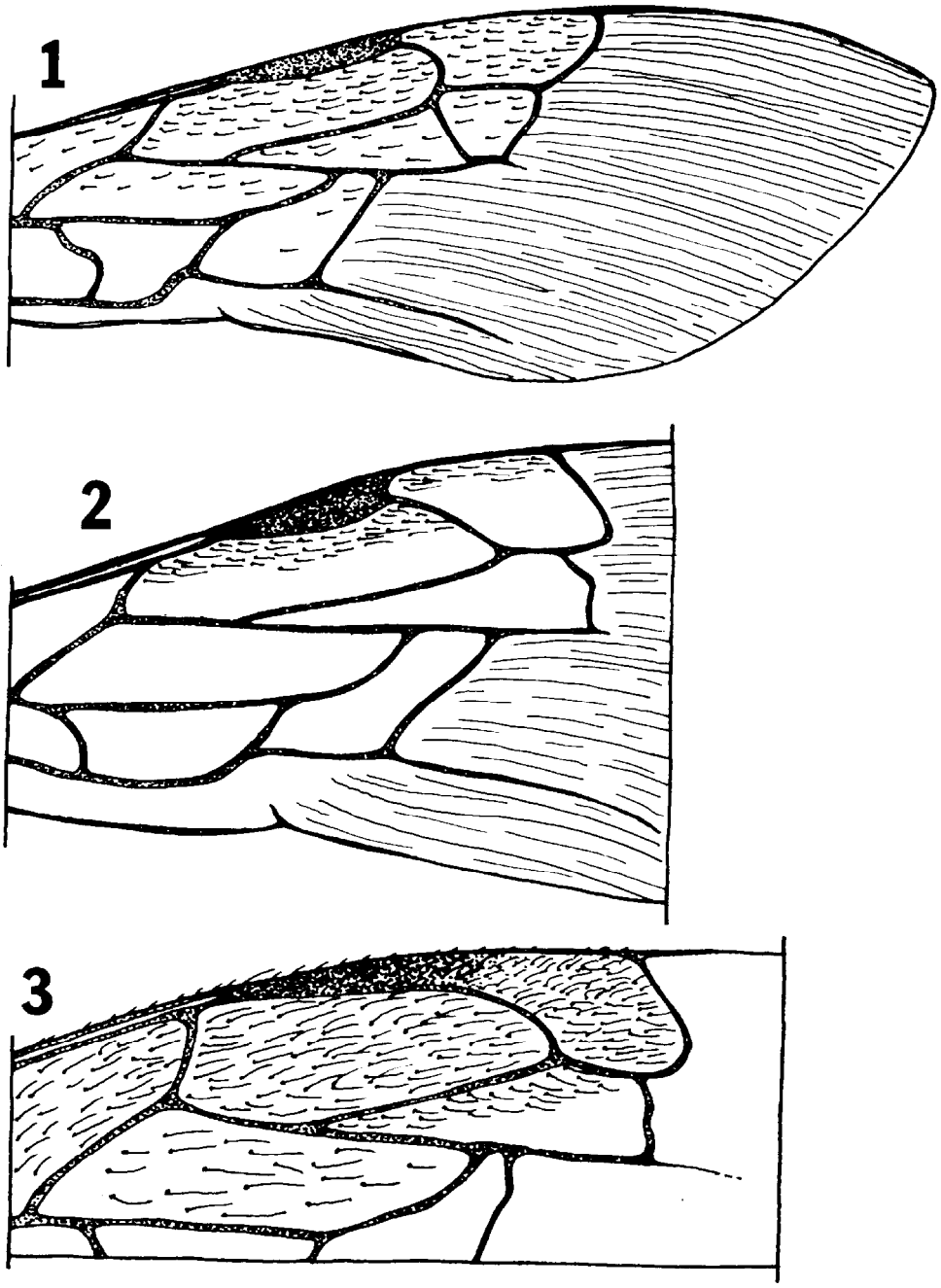

Fig. 1-3. 1) *Trielis octomaculata texensis,* ♂, McAllen, Texas. Fore wing beyond basal vein, showing venation, setae, and longitudinal wrinkling of distal membrane. 2) *Campsomeris tolteca,* ♀, McAllen, Texas. Median portion of fore wing, showing venation and setae. 3) *Campsomeris completa,* ♀, McAllen, Texas. Stigmatic region of fore wing, showing venation and setae.

1980, 1 ♂, 22-VIII-1977, 1 ♀, 1 ♂, 27-VIII-1976, 2 ♀, 1 ♂, 27-VIII-1977, 3 ♀, 1 ♂, 28-VIII-1973, 19 ♀, 33 ♂, 27-31-VIII-1973, 1 ♀, 1 ♂, 30-VIII-1980, 1 ♀, 5 ♂, 31-VIII-1976, 2 ♂, 2-IX-1976, 1 ♀, 4-IX-1976, 1 ♀, 5-IX-1975, 1 ♀, 6-IX-1976, 4 ♀, 8-IX-1975, 1 ♀, 11-IX-1975.

FLOWER RECORDS. During July and August 1980, I took 25 ♀ and 9 ♂ of *T. octomaculata* at flowers of 6 different herbaceous and woody plants. These plants are listed below, according to the number of *Trielis* obtained from each species.

1. *Salix interior* Rowlee (Salicaceae). 7 ♀, 7 ♂.
2. *Ratibida columnaris* D. Don (Compositae). 12 ♀.
3. *Pluchea purpurascens* Sw. (Compositae. 4 ♀, 1 ♂.
4. *Heterotheca latifolia* Buckl. (Compositae). 1 ♀.
5. *Parthenium hysterophorus* L. (Compositae). 1 ♀.
6. *Croton* sp. 1. (Euphorbiaceae). 1 ♂.

HABITAT. *Trielis* prefers exposed places. It is common in pioneering fields (with grasses, *Helianthus, Heterotheca, Parthenium,* and *Croton*), in clearings of *Prosopis-Condalia* scrub, and on *Salix interior* at the edge of Río Grande gallery woods.

MONTHLY PHAENOLOGY. 2 ♀ and 3 ♂ in V, 2 ♀ and 25 ♂ in VI, 19 ♀ and 9 ♂, in VII, 35 ♀ and 46 ♂ in VIII, 8 ♀ and 2 ♂ in IX, and 2 ♂ in XI.

These data show that *Trielis* in the Lower Río Grande Valley flies only from May to November and becomes most numerous in the uniformly hot period from June through September. The species may have 2 discrete generations, since no specimens were collected from 2-22 August.

TEMPERATURE AND DIEL PERIODICITY. *Trielis octomaculata* flies on sunny to partly cloudy days at air temperatures between 27 and 37° C. From early May until September, it begins activity around 0800, reaches greatest abundance between 0900 and 1200, and becomes scarce in the afternoon. During the cooler days of late fall, it appears to emerge progressively later, since my only records for November are of males taken from 1400-1600.

2. *Campsomeris tolteca* (Saussure)
(Fig. 2, 4, 6, 12-14)

SPECIMENS EXAMINED. 97 ♀ and 154 ♂: TEXAS, Hidalgo County, Bentsen Río Grande Valley State Park, 4 ♂, 3-I-1976, 1 ♂, 3-I-1981, 1 ♀, 3 ♂, 14-I-1981, 1 ♂, 14-III-1977, 16 ♀, 10 ♂, 14-23-III-1981, 2 ♂, 1-VI-1973, 1 ♂, 1-VI-1976, 1 ♂, 7-VII-1980, 1 ♀, 2 ♂, 10-VII-1980, 1 ♀, 11-VII-1980, 1 ♂, 14-VII-1980, 3 ♀, 3 ♂, 16-VII-1980, 1 ♀, 6 ♂, 22-VII-1980, 1 ♀, 23-VII-1980, 1 ♀, 24-VII-1980, 1 ♀, 2 ♂, 29-VII-1980, 1 ♀, 31-VII-1980, 4 ♀, 3 ♂, 1-VIII-1980, 5 ♀, 7-VIII-1980, 1 ♂, 13-VIII-1980, 1 ♀, 5 ♂, 15-VIII-1980, 1 ♀, 7 ♂, 18-VIII-1980, 4 ♂, 19-VIII-1980, 1♀, 2 ♂, 20-VIII-1979, 1 ♂, 20-VIII-1980, 1 ♀, 1 ♂, 21-VIII-1979, 1 ♀, 2 ♂, 22-VIII-1980, 2 ♂, 26-VIII-1980, 1 ♀, 2 ♂, 28-VIII-1980, 2 ♂, 29-VIII-1977, 1 ♂, 30-VIII-1977, 1 ♂, 27-XI-1980, 3 ♂, 29-XI-1980, 6 ♀, 10 ♂, 14-XII-1975, 4 ♀, 1 ♂, 27-XII-1975; McAllen Botanical Gardens at McAllen, 1 ♂, 1-I-1918, 1 ♂, 4-I-1975, 1 ♀, 5-I-1974, 1 ♀, 8-I-1980, 1 ♂, 13-I-1980, 1 ♂, 15-I-1975, 1 ♀, 16-I-1975, 1 ♀, 20-I-1980, 2 ♂, 15-III-1976, 2 ♂, 16-III-1973, 1 ♀, 1 ♂, 17-III-1974, 1 ♀, 18-III-1973, 2 ♀, 1 ♂, 22-III-1973, 1 ♀, 1 ♂, 30-III-1975, 1 ♀, 31-III-1975, 1 ♂, 2-IV-1975, 1 ♀, 3 ♂, 16-30-V-1974, 1 ♀, 1 ♂, 25-V-1975, 1 ♀, 28-V-1975, 7 ♂,

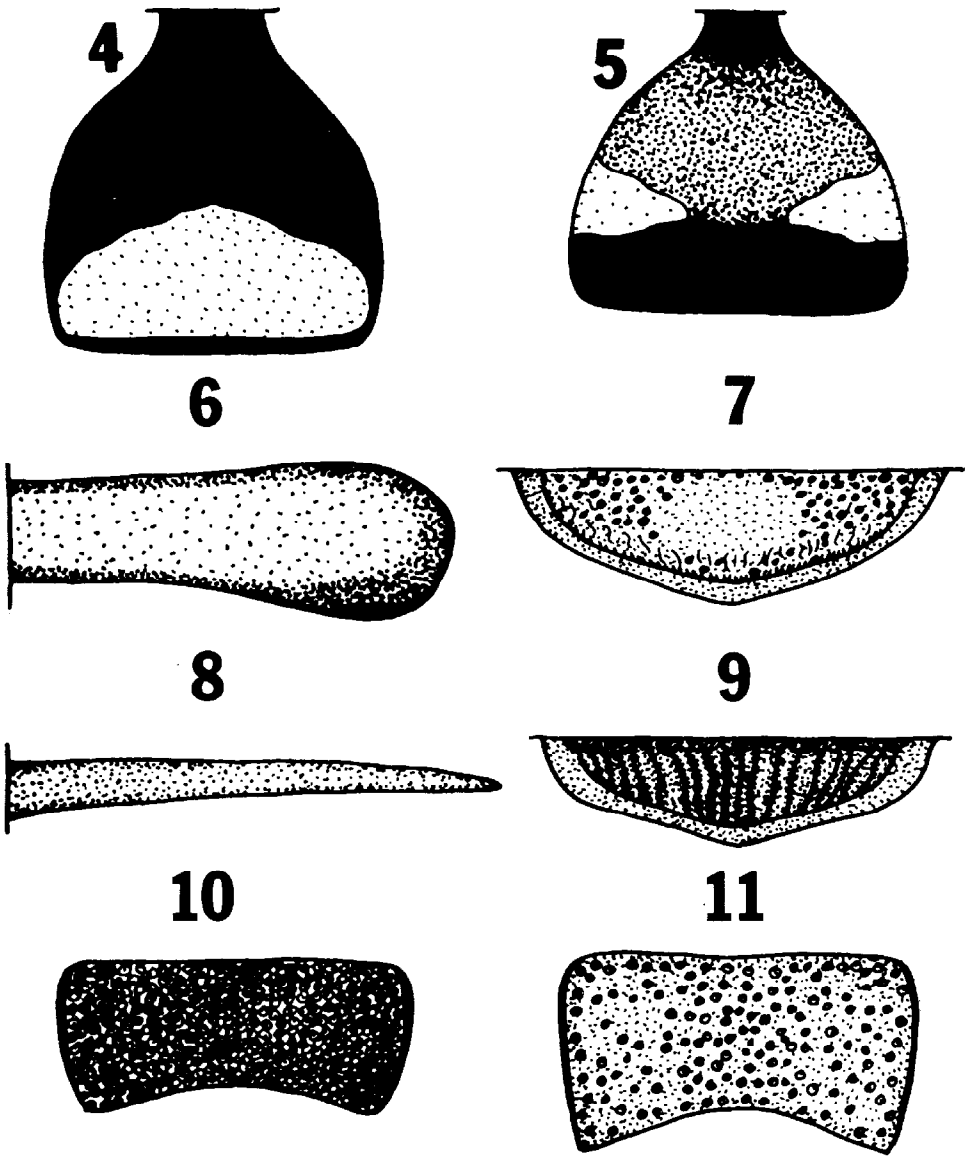

Fig. 4-11. 4) *Campsomeris tolteca*, ♂, McAllen, Texas. Dorsal view of 1st gastric tergite, showing color pattern. 5) *Trielis octomaculata texensis*, ♂, McAllen, Texas. Dorsal view of 1st gastric tergite, showing color pattern. 6) *Campsomeris tolteca*, ♀, McAllen, Texas. Spatulate apex of longer hind tibial spur. 7) *Campsomeris hesterae*, ♀, McAllen, Texas. Anterior view of apical 1/2 of clypeus, showing sculpture and punctation. 8) *Campsomeris completa*, ♀, McAllen, Texas. Acute apex of longer hind tibial spur. 9) *Campsomeris completa*, ♀, McAllen, Texas. Anterior view of apical 1/2 of clypeus, showing vertical wrinkling. 10) *Campsomeris completa*, ♀, McAllen, Texas. Median field of propodeal dorsum, showing dense punctation. 11) *Campsomeris hesterae*, ♀, McAllen, Texas. Median field of propodeal dorsum, showing relatively sparse punctation.

1-13-VI-1973, 1 ♂, 1-V-1976, 2 ♂, 3-VI-1973, 1 ♂, 5-VI-1975, 3 ♂, 6-VI-1973, 1 ♂, 7-VI-1973, 1 ♀, 8-VI-1973, 2 ♀, 9-VI-1973, 1 ♂, 10-VI-1973, 1 ♀, 11-VI-1973, 1 ♂, 12-VI-1976, 1 ♀, 19-VII-1980, 1 ♀, 26-VII-1980, 2 ♀, 2-VIII-1980, 1 ♀, 12-VIII-1980, 2 ♂, 23-VIII-1977, 8 ♀, 15 ♂, 27-VIII-1973, 1 ♀, 1-IX-1975, 1 ♀, 2-IX-1975, 2 ♂, 3-IX-1975, 1 ♀, 4-IX-1975, 1 ♂, 5-IX-1975, 6-IX-1975, 1 ♂, 7-IX-1975, 3 ♀, 4 ♂, 8-IX-1975, 1 ♀, 3 ♂, 20-XII-1973, 5 ♂, 22-XII-1975, 2 ♀, 2 ♂, 23-XII-1975, 1 ♂, 24-XII-1974, 1 ♀, 24-XII-1976, 1 ♂, 25-XII-1975, 1 ♀, 24-XII-1976, 1 ♂, 25-XII-1975, 1 ♀, 26-XII-1975; Santa Ana National Wildlife Refuge near Alamo, 1 ♀, 2 ♂, 24-XII-1975.

FLOWER RECORDS. During November and December 1979, January, July, August, November, and December 1980, and in January and March 1981, I collected 54 ♀ and 80 ♂ of *C. tolteca* from 15 species of flowering plants. These flower records are listed below, according to numbers of *C. tolteca* netted from each species and to the months in which samples were taken.

1. *Salix interior* Rowlee (Salicaceae). 21 ♀, 36 ♂, VII, VIII, XI.
2. *Teucrium cubense* Jacq. (Labiatae). 17 ♀, 14 ♂, XII, I, III.
3. *Aster subulatus* Michx. (Compositae). 2♀, 9 ♂, XI, XII, I.
4. *Pluchea purpurascens* Sw. (Compositae). 5 ♀, VII, VIII.
5. *Croton* sp. 2 (Euphorbiaceae). 5 ♂, I.
6. *Mikania scanden* L. (Compositae). 2 ♀, 1 ♂, I.
7. *Baccharis glutinosa* R. &. P. (Compositae). 2 ♀, 1 ♂, XI.
8. *Verbesina encelioides* Cav. (Compositae). 1 ♀, 2 ♂, XII.
9. *Bumelia celastrina* HBK. (Sapotaceae). 3 ♂, VIII.
10. *Lippia alba* Michx. (Verbenaceae). 3 ♂, VIII.

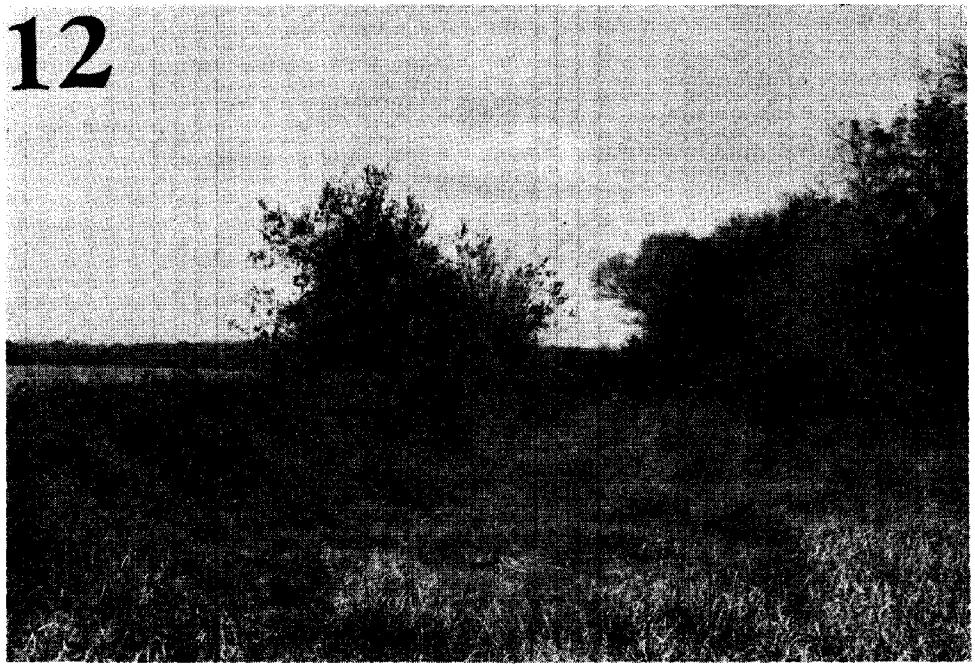

Fig. 12. Habitat of *Campsomeris tolteca, C. hesterae,* and *C. ephippium* photographed during January 1981 at Bentsen Río Grande Valley State Park. *Serjania* vines cover the fence on the left and humid *Celtis* woods appears on the right. Scoliids and many other Hymenoptera abound in this veritable flyway.

11. *Helianthus debilis* Nutt. (Compositae). 1 ♀, 1 ♂, I.
12. *Rhynchosia texana* Turr. & Gray (Leguminosae). 1 ♀, 1 ♂, I.
13. *Cissus incisa* Nutt. (Vitaceae). 1 ♂, VIII.
14. *Sarcostemma cynanchoides* Decne (Asclepiadaceae). 1 ♀, VIII.
15. *Stachys drummondii* Benth. (Labiatae). 1 ♂, I.

HABITAT. *Campsomeris tolteca* is among the most pervasive and common Lower Río Grande Valley Hymenoptera. It occurs in both natural and disturbed habitats, such as *Celtis* woods, gallery woods, semiarid scrub, pioneering fields, old fields, suburban gardens, and citrus orchards. It avoids only the most densely shaded forest. Perhaps the species flies most consistently in partially shaded thickets that are overgrown by *Serjania* vines, intermingled with *Teucrium cubense* and *Mikania scandens*. *Campsomeris tolteca* also may swarm in tall grass along trails through open woods or at the forest edge.

MONTHLY PHAENOLOGY. 5 ♀ and 12 ♂ in I, 22 ♀ and 18 ♂ in III, 1 ♂ in IV, 3 ♀ and 6 ♂ in V, 4 ♀ and 20 ♂ in VI, 12 ♀ and 15 ♂ in VII, 28 ♀ and 48 ♂ in VIII, 7 ♀ and 9 ♂ in IX, 4 ♂ in XI, and 15 ♀ and 23 ♂ in XII.

The preceding records show that *C. tolteca* has been collected during all times available for fieldwork. Given the exceptional abundance of this scoliid, I could retain only a few of the specimens actually seen. The species thus may be characterized as "common" in months that yielded 1-10 records and as "very common" at other periods. South Texas populations of *C. tolteca* seem to occur throughout the year, with a major peak in late summer and a lesser upsurge in January. Evidently, they have multiple and broadly overlapping generations.

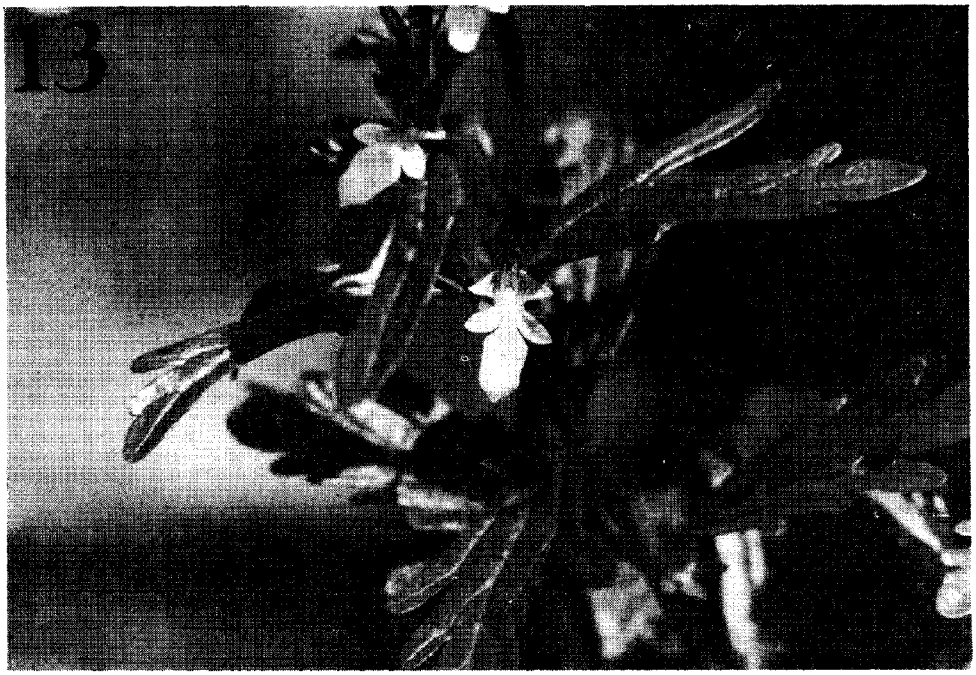

Fig. 13. *Teucrium cubense* photographed during January 1981 at Bentsen Río Grande Valley State Park. This small, ubiquitous woodland labiate attracts great numbers of *C. tolteca* during winter and early spring.

TEMPERATURE AND DIEL PERIODICITY. This wasp flies under both clear and overcast conditions. It is most active at air temperatures between 21.5 and 37° C but may emerge in sheltered, sunny spots when the temperature is as low as 10° C.

Campsomeris tolteca, perhaps in agreement with the above thermic requirements, displays marked seasonal changes in diel periodicity. I noted hourly occurrence for 28 specimens taken in November 1979, December 1979, and January 1980. All these appeared between 1200 and 1600, with 5 collected in the 1st hour, 12 in the 2nd, 8 in the 3rd, and only 3 in the 4th. I also kept 81 hourly records for specimens obtained during July and August 1980. The 25 individuals registered for July appeared from 0800 to 1400, with 2 in the 1st hour, 3 in the 2nd, 11 in the 3rd, 9 in the 4th, none in the 5th and 1 in the 6th. The 56 specimens captured during August appeared between 0900 and 1200, with 11 in the 1st hour, 26 in the 2nd, and 9 in the 3rd. Both summer and winter populations of *C. tolteca* thus show a 4 hour maximum activity period which, in summer, seems primarily matinal, but during winter is shifted into the afternoon.

3. *Campsomeris completa* Rohwer
(Fig. 3, 8, 9, 10)

SPECIMENS EXAMINED. 2 ♀ : TEXAS, Hidalgo County, McAllen Botanical Gardens at McAllen, 1 ♀, 1-IV-1975, 1 ♀, 2-IV-1975.

FIELD NOTES. My Valley specimens were caught in bright sun on trailside foliage along a path through semihumid scrub composed of *Celtis, Condalia, Bumelia, Phaulothamnus, Prosopis, Opuntia,* and *Baccharis,* with many *Uarthenium* and grasses in open parts of the understory. Both records are for early April, but Rohwer (1927: 152) cited Mexican specimens taken in March and October. *Campsomeris completa* thus probably flies throughout much of the year in south Texas.

4. *Campsomeris hesterae* Rohwer
(Fig. 7, 11, 12)

SPECIMENS EXAMINED. 2 ♀ : TEXAS, Hidalgo County, Bentsen Río Grande Valley State Park, 1 ♀, 23-XI-1979; McAllen Botanical Gardens at McAllen, 1 ♀, 31-VIII-1975.

FIELD NOTES. The Bentsen Park specimen was caught on flowers of the shrubby composite, *Baccharis glutinosa.* This plant grew at the edge of *Celtis* woods and emerged from a tangle of *Serjania* vines.

Campsomeris hesterae appears to be a late summer and fall species in south Texas, although Rohwer (1927: 154) indicated that it may emerge as early as June in Guatemala.

Previous literature contains no record of this scoliid from north of México.

5. *Campsomeris ephippium* (Say)
(Fig. 12)

SPECIMENS EXAMINED. 1 ♂ : TEXAS, Hidalgo County, Bentsen Río Grande Valley State Park, 22-III-1978.

FIELD NOTES. My single Texas specimen of *C. ephippium* was found between 1100 and 1200 at an air temperature of 25° C. It was caught while perched on a tangle of *Serjania* vines in a narrow clearing between damp *Celtis* woods and the *Serjania*-covered barbed wire fence that separates the western border of Bentsen Park from adjoining farm land. This segment of the park boundary forms a natural flyway and yields an unusual variety of aculeate and parasitic Hymenoptera.

Campsomeris ephippium is a fast, evasive flier. The Bentsen Park male seemed to show territorial behavior, as it returned several times to the same perch, before finally being netted.

This species probably occurs in south Texas throughout spring and summer. I have several June records from northeast México (Cañón Rayones and Mesa de Chipinque in Nuevo León State), where it is moderately common in habitats that range from lowland subtropical thorn scrub to *Quercus-Pinus* woods at 1200 m.

CONCLUSIONS

TAXONOMY. There is no modern revision of New World Scoliidae. Bradley (1928a, 1928b, 1945, 1957) and Rohwer (1927) gave keys and descriptions that permit identification of the south Texas fauna. I have partially adapted

Fig. 14. Habitat of *Campsomeris tolteca* photographed at Bentsen Río Grande Valley State Park during January 1981. The clearing in the foreground and many of the background trees are overgrown with *Serjania* vines. The most common low herbs are *Teucrium cubense* and *Mikania scandens*, both attractive to *C. tolteca*. The tall, flowering composites are *Helianthus debilis*. These also are visited by moderate numbers of *C. tolteca*. The background trees include *Prosopis, Acacia, Celtis,* and *Fraxinus.*

my own key from these authors, but have expanded some couplets to account for previously overlooked variation and have shortened others to furnish a simpler local identification guide.

Rohwer (1927: 150-1) used propodeal contour to separate females of *Campsomeris completa* from those of *C. hesterae*. He described the "posterior aspect of the propodeum" in *completa* as "sloping, not sharply separated from the dorsal aspect" and in *hesterae* as "perpendicular" and "sharply separated from the dorsal aspect". This feature intergrades in Texas material of the 2 species. Bradley (1957: 65) characterized the female "longer hind tibial spur" of *Xanthocampsomeris* (the subgenus under which he included *completa* and *hesterae*) as "strictly acute". In my specimens of *Xanthocampsomeris* the spur varies from acute to blunt or even feebly spatulate.

ZOOGEOGRAPHY. Scoliids show most diversity in the tropics but have a few species in temperate regions. No scoliid reaches the Neantarctic zone of South America (Porter 1980: 22) or attains Canada in the Northern Hemisphere. The American species display both Neotropic and Sonoran affinities (Porter 1980: 11, 25). In warm climates they frequent all biomes from wet forest to grassland and desert but become especially conspicuous in semiarid to xeric communities. At cooler latitudes they are more strictly confined to deserts or to the open, sunny pioneering stages of forest succession. Scoliids fly powerfully and resist dessication well. These attributes may explain their dispersal into the Greater Antilles, which have isolated populations of certain mainland species as well as a few endemic species.

The Lower Río Grande Valley constitutes primarily a Neotropic semihumid refugium but is surrounded by more arid habitats and supports a substantial intrusive Sonoran biota (Porter 1977). For this reason, the Valley scoliid fauna includes both Sonoran and Neotropic elements.

Trielis octomaculata texensis is a typical Sonoran taxon (Porter 1980: 25-7). It flourishes in the southwestern United States but in the southeast is represented by a rare, disjunct subspecies. Three close relatives of *octomaculata* are confined to the Sonoran biogeographic province. *Trielis* occurs also in southern Brasil and the Palaearctic (Bradley 1928a: 196-7). Our knowledge of scoliid evolution is too scant to permit speculation as to whether the North American *Trielis* are more closely allied to their South American or to their Old World congeners.

Campsomeris tolteca fulfils a semiarid northern Neotropic and Sonoran distribution. It ranges from Texas to California and south as far as central México. Supposedly conspecific populations are reported from Haiti (Bradley 1928b: 317). Its nearest relatives are fully Neotropic. *Campsomeris tolteca* resembles the parapatric Middle and South American *C. dorsata* (Fabricius), which reaches as far south as the north Chilean desert on the west and Uruguay on the east. *Campsomeris plumipes* (Drury) of the eastern and central United States also belongs to this same species group. The whole complex may have originated in early Tertiary South America and spread to Middle and North America by the Oligocene. It adapted to late Tertiary climatic drying but was fragmented in North America by Pleistocene glaciation.

Campsomeris ephippium (south Texas to Ecuador) represents a South American Neotropic radiation, which has extended also into Middle and

North America. Unlike the preceding subgeneric complex, this group is absent from the United States west of south Texas. Like many other distributionally comparable taxa (e.g., 40 of the 174 Neotropic ichneumonid genera, as listed in Porter 1980: 18-9), it does have an endemic species, *C. quadrimaculata* (Fabricius), isolated in the eastern United States.

The closely related *C. hesterae* (Texas to Ecuador) and *C. completa* (Texas and Arizona to El Salvador) are Middle American Neotropic and marginally Sonoran elements. They belong to a species group also represented in the West Indies and south Florida.

The Lower Río Grande Valley Scoliidae thus fall into familiar biogeographic patterns that have been attested not only for most other insects but also for many plants and vertebrate animals (Porter 1980, Graham 1973, Martin 1958). That so many ecologically disparate organisms should manifest similar distributions casts doubt on the traditional viewpoint, which regards dispersal across water or other grossly hazardous barriers as a major factor in shaping the geographic ranges of most biota. At the same time, such data strengthen the thesis that biogeographic paradigms principally may be artifacts of past and present geological and climatic events.

ECOLOGY. The south Texas scoliid assemblage shows strikingly low equitability. Of the 5 species taken since 1973, *Campsomeris tolteca* is represented by 251 specimens, *Trielis octomaculata texensis* by 157, *C. completa* and *C. hesterae* by 2 each, and *C. ephippium* by a single male. Erratic rainfall, rare and unpredictable killing frosts, habitat destruction, and insecticide overuse may be some of the density independent natural and anthropogenic factors, which contribute to this aberrant equitability. The Lower Río Grande Valley provides a marginal environment for many species but permits a few adaptable species to flourish in extravagant numbers (cf. Porter 1977 for a similar equitability pattern in south Texas mesostenine Ichneumonidae).

Campsomeris tolteca and *Trielis octomaculata texensis*, thus, have been collected in quantities sufficient to allow comparison of their phaenology, thermic requirements, habitat differentiation, and floral selection. *Trielis octomaculata* flies from May to November and is most common in summer. It is active when shade temperatures range between 27 and 37° C. *Octomaculata* frequents open places, such as sparse thorn scrub or overgrown fields. Its 1st and 3rd floral preferences, *Salix interior* and *Pluchea purpurascens*, correspond to the 1st and 4th choices of *C. tolteca*. The remaining 4 flowers from which it has been recorded do not seem to attract other Valley scoliids. *Campsomeris tolteca* flies throughout the year and is common in summer and winter. It may emerge when the shade temperature is as low as 10° C but becomes conspicuously active only between 21.5 and 37° C. *Campsomeris tolteca* occurs in a wide spectrum of natural and disturbed habitats but often abounds in semi-open woods, where the more phanerobiotic *T. octomaculata* never ventures. As already mentioned, *C. tolteca* regularly visits 2 of the flowers that are most attractive to *T. octomaculata* but also has been taken on blossoms of 13 additional palnts never visited by the *Trielis*.

The 2 dominant Valley scoliids thus show partial differentiation in at least 4 ecologic parameters. The possible competitive significance of this

differentiation will be clarified, when the hosts of both species are discovered.

Collections

This study is based on collections made by the author. Material covered in this study has been deposited in the Florida State Collection of Arthropods (Division of Plant Industry, P. O. Box 1269, Gainesville, FL 32602) and in the author's private collection (301 N. 39th Street, McAllen, TX 78501).

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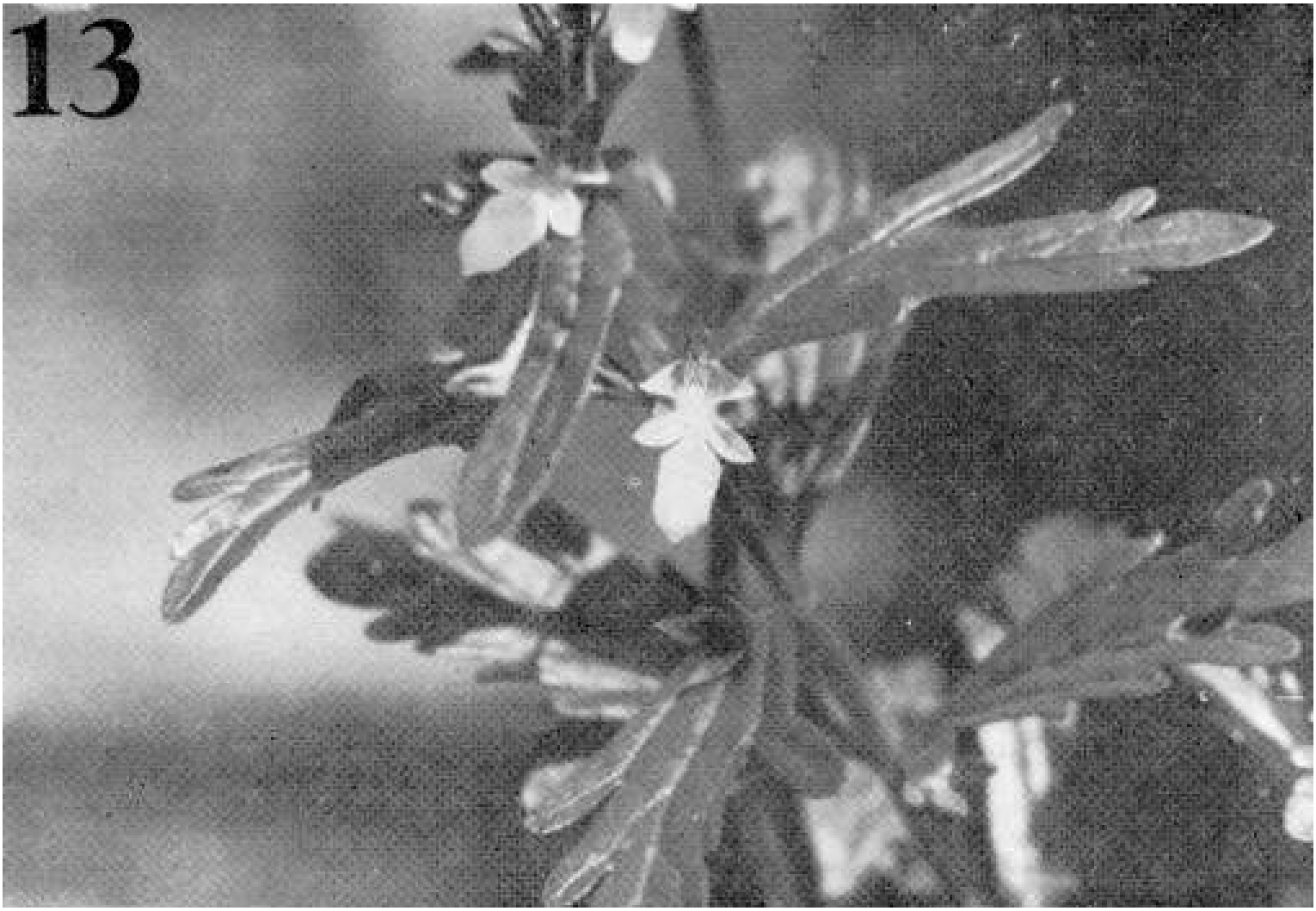
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