

condition (the terminalia have been removed, dissected, and placed in an attached microvial).

ETYMOLOGY: The species epithet, *wirthi*, is a genitive patronym to honor Dr. Willis W. Wirth, whose contributions to our knowledge of Ephydriidae, encouragement, and friendship are gratefully acknowledged.

ZOOGEOGRAPHIC DISTRIBUTION: This species apparently is to be found in most of subtropical Florida, where marshes occur.

REMARKS: Mathis and Wirth (1977) diagnosed this species but purposely did not name it then, as explained earlier. Their deferment was justified, as the 2nd specimen has allowed detection of several new characters not noted previously.

ACKNOWLEDGMENTS

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BICYRTEs LEPELETIER (HYMENOPTERA: SPHECIDAE) IN THE LOWER RIO GRANDE VALLEY OF TEXAS AND IN NORTHEAST MEXICO¹

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ABSTRACT

Bicyrtes is represented in the Lower Río Grande Valley and adjacent México by 5 species: *B. capnoptera* (Handlirsch), *B. fodiens* (Handlirsch), *B. variegata* Olivier, *B. ventralis* (Say), and *B. viduata* (Handlirsch). Adults fly between March and September but vary greatly in abundance from year to year. *Bicyrtes* nests in sand, often along rivers. It visits flowers, especially of *Baccharis*, *Pluchea*, and *Ratibida*. The genus seems of Neotropic origin, but its south Texas fauna includes Neotropic, Sonoran, and Nearctic elements.

Since 1973, I have been surveying Hymenoptera in the Lower Río Grande Valley of Texas, with occasional work in nearby México. I have published

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articles on Valley ichneumonids of the genus *Thyreodon* (Porter 1976) and of the tribe Mesostenini (Porter 1977), on eumenids of the genus *Zethus* (Porter 1975), and on sphecids of the tribe Sphecini (Porter 1978). I now furnish data on the bembicine sphecid genus *Bicyrtes*. Bohart and Horning (1971) have keyed the North and Middle American *Bicyrtes*, but little has been published about distribution, phaenology, and habits of the Texan and Mexican species.

Bicyrtes are stout, medium-sized bembicines, distinctive because they have the lateral angles of the propodeum broadly projecting rearward. They prefer semihumid to arid habitats and often frequent open places in bright sun. Like many sphecids, *Bicyrtes* becomes most abundant in summer and disappears during winter, except in the genuinely tropical regions about 12° on each side of the equator. The genus stocks its nests with Heteroptera, especially Pentatomidae and Coreidae. It nests in sand, and some species choose damp sand near water.

The 23 described *Bicyrtes* are restricted to the New World (Bohart and Menke 1976: 537-8) and centered in the Neotropics. There are 15 Neotropic species, of which 12 are confined to South America. In North and Central America, 1 *Bicyrtes* inhabits only the eastern U. S., 3 cover much of the U. S. and north México, 1 extends through the southern U. S. and México to Central America, while 3 have essentially Sonoran ranges in the southwestern U. S. and México.

Bicyrtes EXAMINED IN THIS STUDY

1. *Bicyrtes capnoptera* (Handlirsch).

MATERIAL EXAMINED: 12 ♀ and 19 ♂: MEXICO, Nuevo León State, Cañón Huasteca near Monterrey, 3 ♀, 19-VI-1976; UNITED STATES, Texas, Hidalgo County, Bentsen Río Grande Valley State Park, 1 ♀, 1 ♂, 1-VI-1979, 1 ♂, 4-VI-1973, 3 ♂, 7-IX-1976; Valley Botanical Garden at McAllen, 2 ♀, 31-III-1975, 1 ♀, 1-IV-1975, 1 ♀, 3-IV-1975, 1 ♂, 5-IV-1975, 1 ♂, 29-VI-1979, 1 ♂, 26-VII-1979, 1 ♂, 1-IX-1978, 3 ♂, 3-IX-1976, 2 ♂, 1 ♀, 5-IX-1976, 1 ♀, 11-IX-1976, 1 ♀, 12-IX-1976.

FIELD NOTES: *B. capnoptera* usually is collected from small flowering herbs in open fields on sunny days. It often visits *Ratibida columnaris* (Sims) D. Don and *Pluchea purpurascens* (Swartz) DC.

PHAENOLOGY: Two ♀ in March, 2 ♀ and 1 ♂ in April, 1 ♂ in May, 4 ♀ and 2 ♂ in June, 1 ♂ in July, and 4 ♀ and 14 ♂ in September.

2. *Bicyrtes fodiens* (Handlirsch).

MATERIAL EXAMINED: 4 ♀ and 4 ♂: MEXICO, Nuevo León State, Cañón los Rayones near Montemorelos, 2 ♂, 11-VI-1975; Cañón Huasteca near Monterrey, 3 ♀, 19-VI-1976; UNITED STATES, Texas, Hidalgo County, Bentsen Río Grande Valley State Park, 1 ♀, 1-VI-1979; Valley Botanical Garden at McAllen, 1 ♂, 5-VI-1975, 1 ♂, 28-VII-1979.

FIELD NOTES: This species appears to occur under the same conditions as *B. capnoptera*, from which it is hard to distinguish in the field.

PHAENOLOGY: Four ♀ and 3 ♂ in June and 1 ♂ in July.

3. *Bicyrtes variegata* (Olivier).

MATERIAL EXAMINED: 2 ♀ and 1 ♂: UNITED STATES, Texas, Hidalgo County, Bentsen Río Grande Valley State Park, 1 ♀, 24-VIII-1979, 1 ♂, 30-VIII-1978; Valley Botanical Garden at McAllen, 1 ♀, 2-IX-1976.

FIELD NOTES: Taken on flowers of the shrubs, *Baccharis glutinosa* (Ruíz López & Pavón) Persoon and *B. neglecta* Britton.

PHAENOLOGY: One ♀ and 1 ♂ in August and 1 ♀ in September. I have collected *B. variegata* during the winter months of June and July in the Peruvian Coastal Desert from Lima northward.

4. *Bicyrtes ventralis* (Say).

MATERIAL EXAMINED: 1 ♀ : MEXICO, Nuevo León State, Cañón Huasteca near Monterrey, 1 ♀, 19-VI-1976.

FIELD NOTES: My single specimen was collected from flowers of *Ratibida columnaris* (Sims) D. Don in an overgrown field bordered by *Chilopsis*, *Fraxinus*, *Acacia*, *Prosopis*, and other xerophile to moderately hygrophile trees and shrubs.

PHAENOLOGY: One ♀ in June. In the northeastern U. S. (New Jersey, Maryland) I have collected *B. ventralis* during July and August.

5. *Bicyrtes viduata* (Handlirsch).

MATERIAL EXAMINED: 15 ♀ and 9 ♂ : MEXICO, Nuevo León State, Cañón Huasteca near Monterrey, 2 ♀, 3 ♂, 19-VI-1976; UNITED STATES, Texas, Hidalgo County, Bentsen Río Grande Valley State Park, 1 ♀, 27-VII-1979, 1 ♀, 7-VIII-1979, 2 ♀, 16-VIII-1979, 1 ♂, 24-VIII-1979, 3 ♀, 30-VIII-1978, 1 ♀, 31-VIII-1977; Valley Botanical Garden at McAllen, 1 ♀, 26-V-1975, 1 ♀, 27-V-1975, 1 ♀, 28-V-1975, 1 ♀, 29-V-1979, 2 ♂, 3-VI-1976, 1 ♂, 5-VI-1975, 2 ♂, 1-IX-1978, 1 ♀, 3-IX-1977.

FIELD NOTES: I have caught *B. viduata* most often on flowers of the shrubs *Baccharis glutinosa* (Ruíz López & Pavón) Pers. and *B. neglecta* Britton. It also visits *Pluchea purpurascens* (Swartz) DC. and *Ratibida columnaris* (Sims) D. Don and on hot days (38°C) sometimes enters densely shaded *Celtis lindheimeri* Engelm. ex K. Koch woods to seek the flowers of *Rivina humilis* Linnaeus.

I have often seen *B. viduata* nesting in sand along the Río Grande at Bentsen State Park. Sometimes it constructs burrows in exposed sites, but also may be found nesting in the shade of gallery woods.

PHAENOLOGY: Four ♀ in May, 2 ♀ and 6 ♂ in June, 1 ♀ in July, 7 ♀ and 1 ♂ in August, and 1 ♀ and 2 ♂ in September.

CONCLUSIONS

ZOOGEOGRAPHY: The Lower Río Grande Valley *Bicyrtes* fauna comprises species that belong to several different zoogeographic categories. *Bicyrtes variegata* is a typical wide-ranging Neotropical species that occurs from south Texas to Argentina. *Bicyrtes fodiens* extends through Nearctic, Sonoran, and Neotropical regions in the whole southern U. S., México, and Central America. Both *B. capnoptera* and *B. ventralis* occupy much of the U. S. and northern México. *Bicyrtes viduata* fulfills a Sonoran distributional pattern in the southwestern U. S. and México.

As I have postulated for the *thomae* group of the sphecine genus *Prionyx* (Porter 1978: 173), the moderately xerophile *Bicyrtes*, being most diverse in South America, also could have originated in drier parts of the southern continent. It could have evolved in the early Tertiary along with the "flora adapted to a seasonally dry climate" that then supposedly existed "at middle latitudes, particularly in the western part of South America" (Solbrig 1976: 36). Drier, post-Eocene climates probably favored the migration of *Bicyrtes*

into Middle and North America while, simultaneously, its predilection for nesting sites in damp sand along rivers allowed penetration of the South American lowland tropics. Pleistocene glacial and interglacial episodes doubtless fragmented *Bicyrtes* populations, promoting evolution of some endemically North American species. However, such fragmentation must have been brief and sporadic, since *Bicyrtes* forms a compact taxon, and the U. S. species differ little in structure or natural history from their South American relatives.

PHAENOLOGY: I have collected in south Texas by hand and Malaise trap but have obtained *Bicyrtes* there only by hand. Since 1973, I have visited the Lower Río Grande Valley each year for about 30 days in December and January, 1 week in March, 2 weeks in May, 2 weeks in June, 1 week in August, and 1 week in September. I also have collected there for 1 week in November 1977 and 1 week in November 1979 as well as in late July and most of August in 1979. *Bicyrtes* were captured only between March and September, and these records are summarized in Table 1.

Valley *Bicyrtes* thus fly from spring to fall and peak during June (4 species, 22 specimens) and September (3 species, 21 specimens). I have never found the genus in winter, although many other Hymenoptera remain common or reach maximum abundance then (Porter 1978: 175-6). The seasonal phaenology of *Bicyrtes* thus agrees with that of most other Valley Sphecidae and closely parallels that which I have already documented for the tribe Sphecini (Porter 1978: 175).

Monthly phaenologic records also suggest some temporal differentiation among Valley *Bicyrtes* species. Most notably, *B. capnoptera* appears to peak in September, while the closely related *B. fodiens* is most common during June.

As mentioned in previous studies (Porter 1977, 1978) most Valley Hymenoptera vary dramatically in abundance from year to year, and such fluctuations may be linked to density independent factors such as the region's erratic rainfall and unpredictable winter frosts. *Bicyrtes* follows this pattern. As shown in Table 2, 28 specimens and 4 species were collected in the

TABLE 1. MONTHLY PHAENOLOGY OF *Bicyrtes* POPULATIONS IN THE LOWER RIO GRANDE VALLEY OF TEXAS AND IN NORTHEAST MEXICO.

Species of <i>Bicyrtes</i>	Month						
	March	April	May	June	July	August	Sep- tember
<i>capnoptera</i>	2	3	1	6	1	—	18
<i>fodiens</i>	—	—	—	7	1	—	—
<i>variegata</i>	—	—	—	—	—	2	1
<i>ventralis</i>	—	—	—	1	—	—	—
<i>viduata</i>	—	—	4	8	1	8	3
Total species/ month	1	1	2	4	3	2	3
Total specimens/ month	2	3	5	22	3	10	22

Total specimens collected: 67.

TABLE 2. ANNUAL PHAENOLOGY OF *Bicyrtes* POPULATIONS IN THE LOWER RIO GRANDE VALLEY OF TEXAS AND IN NORTHEAST MEXICO.

Species of <i>Bicyrtes</i>	Year						
	1973	1974	1975	1976	1977	1978	1979
<i>capnoptera</i>	5	—	5	16	—	1	4
<i>fodiens</i>	—	—	3	3	—	—	2
<i>variegata</i>	—	—	—	1	—	1	1
<i>ventralis</i>	—	—	—	1	—	—	—
<i>viduata</i>	—	—	4	7	2	5	6
Total species/ year	1	0	3	5	1	3	4
Total specimens/ year	5	0	12	28	2	7	13

Valley during 1976, whereas 1974 yielded no *Bicyrtes*, and 1977 provided just 2 specimens of a single species.

COLLECTIONS

Material studied for this research has been divided between the Florida State Collection of Arthropods (Division of Plant Industry, P. O. Box 1269, Gainesville, FL 32602) and the author's private collection (301 N. 39th St., McAllen, TX 78501).

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