

Host-Parasite Associations in some Twig-Nesting Hymenoptera from Western North America¹

F. D. PARKER AND R. M. BOHART

University of California, Davis

A biological study of twig-nesting wasps has been underway at Davis for about 5 years. In this time we have recorded observations on about 1,800 nests from twigs collected primarily in California and Nevada, but also in Arizona. Although the study is being continued, we are summarizing the information accumulated thus far in order to facilitate similar studies by other workers and to provide biological association records for the forthcoming addition to the Hymenoptera Catalog.

Data from twigs collected in the field during the dormant season and brought into the laboratory for emergence showed that the number of nests lost as result of summer emergence (7%) did not significantly reduce the total number of nests recovered. Since our study was primarily intended to be a survey, filled stems were recovered only at the end of the nesting season.

Natural cavities were the primary source of the nests, but during the 1963-1964 season cut and drilled stems were also used. The number of nests recovered from natural holes was 1,376 and the number in trap stems was 330 out of 1,000 originally placed in the field. The natural cavities were primarily made by Hymenoptera of the genera *Ceratina*, *Pemphredon*, *Stigmus*, and *Ectemnius*. Abandoned beetle burrows and old galls furnished suitable nesting cavities also. In our experience the most important plants which offer nesting sites are *Sambucus*, *Foeniculum*, *Eriogonum*, *Tetradymia*, and *Ephedra*.

The trap nests were made by cutting *Sambucus* stems into 18-inch lengths and drilling holes in one end; the opposite end was sharpened to facilitate placement in the ground. The hole diameter varied from one-fourth to $\frac{1}{16}$ of an inch. Additional holes were made at random along the sides of a few stems and these were utilized as well as the terminal ones.

The cut stems were placed individually in the ground and it was found through trial and error that the best results came from stems placed in long rows, 3 to 5 feet apart. Also, stems set out in this manner were more easily located the following winter. Stems tied in bundles and placed in bushes did not yield as many nests as those set out individually.

Following collection in the dormant season, the twigs were split in the laboratory and notes were made concerning nest structure. The cell

¹ This study was supported in part by National Science Foundation Grant NSF GB-3074.

contents were placed individually in gelatin capsules (sizes 000 and 00), each with a corresponding rearing number placed on the outside and held between the cap and the bottom of the capsule. We found that if the rearing number was left inside, the emerging occupant often shredded the paper in an attempt to get out.

Identifications have been provided from specialists as follows: R. C. Bechtel, Nevada State Department of Agriculture—Sapygidae; G. E. Bohart, USDA Logan, Utah—Megachilidae; R. M. Bohart, University of California, Davis—Chrysididae, Eumenidae, Sphecidae; B. D. Burks, USNM—Chalcidoidea; H. E. Evans, Museum of Comparative Zoology—Pompilidae; W. E. Ferguson, San Jose State College—Mutillidae; A. R. Gittins, University of Idaho—Sphecidae; J. C. Hall, University of California, Riverside—Bombyliidae; K. V. Krombein, USNM—Sphecidae; N. Marston, Kansas State University—Bombyliidae; C. D. Michener, University of Kansas—Megachilidae; T. B. Mitchell, North Carolina State College—Megachilidae; F. D. Parker, University of California, Davis—Sphecidae, Eumenidae; H. J. Reinhard, Texas A & M College—Sarcophagidae; M. R. Smith, USNM—Formicidae; R. R. Snelling, Los Angeles County Museum—Colletidae; R. B. Selander, University of Illinois—Meloidae; H. M. Townes, American Entomological Institute—Ichneumonidae, Gasteruptiidae; M. S. Wasbauer, California State Department of Agriculture—Pompilidae.

Nesting localities not identified with incorporated towns are as follows: CALIFORNIA: Boca, east of Truckee, Nevada Co.; Carnelian Bay, Lake Tahoe, Placer Co.; Putah Canyon, west of Winters, Yolo Co.; Arroyo Seco Camp, west of Greenfield, Monterey Co.; Whitewater Canyon, east of Banning, Riverside Co.; Glamis, 15 miles east of Brawley, Imperial Co. NEVADA: Geiger Grade, near Reno, Washoe Co.; Mustang, Washoe Co., 5 miles east Sparks; Patrick, Washoe Co., 15 miles east Sparks; Galena Creek, north side of Mt. Rose, south of Reno, Washoe Co. ARIZONA: Sabino Canyon, northeast of Tucson, Pima Co.

In the following list we have arranged the primary twig-nesting Hymenoptera by family with indication of locality, type of nesting site, number of nests observed, and parasites associated.

EUMENIDAE

Ancistrocerus antilope (Panzer). Nevada: Verdi. *Sambucus* stems; one nest. No parasites.

Ancistrocerus bustamente (Saussure). California: Borego, Whitewater Canyon. Trap stems; four nests. No parasites.

Ancistrocerus catskill halophilus Viereck. California: Putah Canyon, Boca.

Nevada: Verdi. *Sambucus* and trap stems; 10 nests. PARASITES: *Chrysis derivata* Buysson (Chrysididae).

Ancistrocerus lineativentris Cameron. Nevada: Verdi. *Sambucus* stems; 11 nests. PARASITES: *Pimpla spatulata* Townes (Ichneumonidae); *Chrysis inflata* Aaron (Chrysididae); *Amobia floridensis* Townsend, *Psalidopteryx* sp. (Sarcophagidae).

Ancistrocerus spilogaster Cameron. Nevada: Geiger Grade, Reno, Verdi. California: Boca, Putah Canyon. *Sambucus* and trap stems; made mud nests on rocks; 14 nests. PARASITES: *Aritranis notata sierrae* Townes (Ichneumonidae); *Chrysis coerulans* Fabricius; *Chrysis pattoni* Aaron (Chrysididae).

Ancistrocerus tigris cytainus (Cameron). California: Davis, Putah Canyon. *Sambucus* and trap stems; old *Sceliphron* nests; nine nests. PARASITES: *Chrysis coerulans* Fabricius (Chrysididae).

Euodynerus foraminatus scutellaris (Saussure). California: Davis, Putah Canyon. Nevada: Verdi. *Sambucus* and trap stems, and old *Sceliphron* nests; 40 nests. PARASITES: *Lycogaster pullata nevadensis* (Cresson) (Trigonalidae); *Chrysis derivata* Buysson; *Chrysis coerulans* Fabricius; *Chrysis parkeri* Moore (Chrysididae); *Amobia floridensis* Townsend (Sarcophagidae); *Anthrax irroratus* Say (Bombyliidae); *Epistenia* sp. (Pteromalidae).

Euodynerus oslarensis (Cameron). California: Coyote Creek, north of Borego, 18 miles west Blythe. Trap stems; two nests. No parasites.

Euodynerus pratensis (Saussure). California: 18 miles west Blythe. Trap stems; one nest.

Leptochilus rufinodus (Cresson). California: Carnelian Bay, Davis. Nevada: Nixon, Mustang, Verdi. *Sambucus* and trap stems; 65 nests. PARASITES: *Epistenia* sp. (Pteromalidae); *Clistopyga canadensis* Provancher (Ichneumonidae); *Anthrax irroratus* Say (Bombyliidae); *Ceratochrysis tuberella* Bohart, *Chrysis parkeri* Moore (Chrysididae); *Eurytoma* sp. (Eurytomidae).

Leptochilus tosquineti (Cameron). California: Davis. Nevada: Verdi, Nixon. *Sambucus* stems and galls on *Tetradymia*; three nests. No parasites.

Pachodynerus acuticarinatus (Cameron). Arizona: Sabino Canyon. Holes in wood; three nests. No parasites.

Pachodynerus pulverulenta (Viereck). California: Borego. Trap stems; two nests. PARASITES: *Sphaerophthalma* (*Photopsiodes*) *uro stenognatha* Schuster (Mutillidae).

Parancistrocerus acarigaster Bohart. California: Davis. Nevada: Verdi. *Sambucus* stems and old *Sceliphron* nests; six nests. PARASITES: *Chrysis parkeri* Moore (Chrysididae).

Parancistrocerus acarophorus Bohart. California: Putah Canyon. Nevada: Verdi. *Sambucus* stems; 16 nests. PARASITES: *Chrysis coerulans* Fabricius (Chrysididae).

Parancistrocerus toltecus (Saussure). California: 18 miles west Blythe. Nevada: Nixon. *Tetradymia* and trap stems; 16 nests. PARASITES: *Toxophora virgata* Osten Sacken (Bombyliidae); *Chrysis barri* Bohart (Chrysididae).

Stenodynerus blandus (Saussure). California: Carnelian Bay, Davis, Putah Canyon. *Sambucus* and trap stems; three nests. No parasites.

Stenodynerus cochisensis (Viereck). California: Boca. Trap stems; one nest. No parasites.

Stenodynerus coniodes Bohart. Nevada: Nixon. *Tetradymia* stems; one nest. No parasites.

Symmorphus meridionalis Viereck. Nevada: Verdi. *Sambucus* stems; one nest. No parasites.

Symmorphus cristatus nevadensis (Cameron). Nevada: Verdi. *Sambucus* stems; four nests. PARASITES: *Chrysis derivata* Buysson (Chrysididae).

Symmorphus projectus Bohart. California: Putah Canyon. *Sambucus* stems; one nest. No parasites.

POMPILIDAE

Auplopus nigrellus (Banks). California: Davis. *Sambucus* stems; two nests. No parasites.

Dipogon calipterus nubifer (Cresson). California: Putah Canyon. *Sambucus* stems; four nests. No parasites.

Dipogon parkeri Wasbauer. Nevada: Mustang. Holes in wood; one nest. No parasites.

SPHECIDAE

Crossocerus fergusonii Pate. California: Putah Canyon. Nevada: Verdi. *Sambucus* stems; 29 nests. PARASITES: *Diomorus zabriskiei* Cresson (Torymidae); *Amobia floridensis* Townsend, *Macronichia* sp. (Sarcophagidae).

Psenulus (*Diodontus* of authors) *alienus* (Krombein). Nevada: Verdi. *Sambucus* stems; two nests. No parasites. PREY: Adult Psyllidae.

Ectemnius spiniferus (Fox). California: Putah Canyon, Davis. Nevada: Galena Creek, Verdi. *Sambucus*, *Foeniculum*, and *Eriogonum* stems; 30 nests. PARASITES: *Senotainia trilineata* Vanderwump, *Macronichia* sp., *Amobia floridensis* Townsend (Sarcophagidae); *Diomorus zabriskiei* Cresson (Torymidae).

Crossocerus (Epicrossocerus) insolens (Fox). California: Putah Canyon, Davis. Nevada: Verdi. *Sambucus* stems; five nests. PARASITES: *Diomorus zabriskiei* Cresson (Torymidae). PREY: *Pachyneuron* sp. (Pteromalidae); *Tetrastichus pattersonae* Fullaway, *Tetrastichus* sp. (Eulophidae).

Euplilis arapaho Pate. Nevada: Verdi. California: Putah Canyon. *Sambucus* stems; six nests. PARASITES: *Diomorus zabriskiei* Cresson (Torymidae).

Isodontia elegans (Smith). Nevada: Verdi. *Sambucus* and trap stems; 11 nests. PARASITES: *Epistenia coeruleata* Westwood (Pteromalidae); *Amobia floridensis* Townsend (Sarcophagidae).

Pemphredon errans Rohwer. California: Putah Canyon. Nevada: Verdi. *Sambucus* stems; 105 nests. PARASITES: *Omalus janus* (Haldeman); *Omalus purpuratus* Provancher (Chrysididae); *Anthrax irroratus* Say (Bombyliidae); *Perithous mediator neomexicanus* Viereck (Ichneumonidae); *Senotainia trilineata* Vanderwump (Sarcophagidae).

Pemphredon giffardi (Rohwer). California: Corona, Putah Canyon, Davis. Nevada: Verdi. *Sambucus* stems; 130 nests. PARASITES: *Habrocytus analis* (Ashmead) (Pteromalidae); *Eurytoma stigma* Ashmead (Eurytomidae); *Omalus trilobatus* Bohart and Campos, *Omalus cressoni* (Aaron) (Chrysididae); *Anthrax irroratus* Say (Bombyliidae).

Pemphredon lethifer (Shuckard). California: Gardenia. *Foeniculum* stems; one nest. No parasites.

Pisonopsis birkmanni Rohwer. California: Davis, Blythe. Nevada: Mustang,

Verdi. *Sambucus* and trap stems; 15 nests. PARASITES: *Ceratochrysis antyga* Bohart (Chrysididae).

Solierella blaisdelli (Bridwell). Nevada: Verdi. *Eriogonum* stems; three nests. PARASITES: *Lomachaeta variegata* Mickel (Mutillidae).

Solierella similis (Bridwell). Nevada: Reno, Verdi. California: Putah Canyon. *Sambucus*, *Foeniculum*, *Eriogonum*, and trap stems; 26 nests. PARASITES: *Lomachaeta variegata* Mickel (Mutillidae), *Eurytoma stigma* Ashmead (Eurytomidae); *Senotainia trilineata* Vanderwump (Sarcophagidae).

Stigmus inordinatus Fox. California: Putah Canyon. Nevada: Verdi. *Sambucus* stems; 25 nests. PARASITES: *Omalus variatus* (Aaron), *Omalus glomeratus* (Buysson), *Omalus cressoni* (Aaron) (Chrysididae).

Tracheliodes foveolineatus (Viereck). Nevada: Verdi. California: Putah Canyon. *Sambucus* stems; four nests. No parasites. PREY: *Liometopum occidentale luctuosum* Wheeler (Worker) (Formicidae).

Trypoxylon tridentatum Packard. California: Borego, Davis, Putah Canyon. Nevada: Verdi. *Sambucus* and trap stems, old *Sceliphron* nests; 18 nests. PARASITES: *Amobia floridensis* Townsend (Sarcophagidae); *Epistenia coeruleata* Westwood (Pteromalidae); *Chrysis pellucidula* Aaron, *Trichrysis deversor* Bohart, *Ceratochrysis antyga* Bohart (Chrysididae).

Trypoxylon aldrichi Sandhouse. California: Carnelian Bay. Trap stems; one nest. No parasites.

Trypoxylon bidentatum Fox. California: Boca, Putah Canyon. Nevada: Mustang, Verdi. *Sambucus* and trap stems; 16 nests. PARASITES: *Trichrysis doriae* (Gribodo) (Chrysididae).

Trypoxylon frigidum Smith. Nevada: Verdi. *Sambucus* stems; two nests. No parasites.

Trypoxylon sculleni Sandhouse. California: Davis, Putah Canyon. Nevada: Mustang, Patrick, Verdi. *Sambucus*, *Eriogonum*, and trap stems; 55 nests. PARASITES: *Aprostocetus* sp. (Ichneumonidae); *Eurytoma stigma* Ashmead (Eurytomidae); *Trichrysis doriae* (Gribodo); *Anthrax irroratus* Say (Bombyliidae); *Amobia floridensis* Townsend (Sarcophagidae); *Dibrachys* sp. (Pteromalidae).

COLLETIDAE

Hylaeus (H.) cressoni (Cockerell). Nevada: Reno, Verdi, Mustang. California: Boca. *Sambucus* and trap stems; 12 nests. PARASITES: *Rhydinofoenus visaliae* Bradley (Gasteruptiidae).

Hylaeus (H.) rudbeckiae (Cockerell). Nevada: Verdi. *Eriogonum* stems; one nest. No parasites.

Hylaeus (H.) verticalis (Cresson). Nevada: Verdi. *Sambucus* stems; eight nests. No parasites.

Hylaeus (Paraprosopis) polifolii (Cockerell). California: Antioch. Trap stems; two nests. PARASITES: *Eurytoma stigma* (Eurytomidae).

MEGACHILIDAE

Anthidium maculosum Cresson. Nevada: Verdi. *Sambucus* stems; one nest. PARASITES: *Leucospis affinis* Say (Leucospidae).

Anthocopa copelandica (Cockerell). California: Boca. Trap stems; two nests. No parasites.

Ashmeadiella aridula Cockerell. Nevada: Reno, Nixon, Mustang, Verdi. California: Putah Canyon, Davis. *Sambucus* and trap stems; 100 nests. PARASITES: *Chrysura sonorensis* (Cameron) (Chrysididae); *Leucospis affinis* Say (Leucospidae); *Anthrax irroratus* Say (Bombyliidae); *Sapyga pumila* Cresson (Sapygidae); *Epistenia* sp. (Pteromalidae).

Ashmeadiella bigeloviae (Cockerell). California: Borego, Glamis. Trap stems; 18 nests. No parasites.

Ashmeadiella buconis denticulata (Cresson). Nevada: Nixon. Trap stems; four nests. No parasites.

Ashmeadiella gillettei Titus. Nevada: Nixon, Mustang, Patrick. Trap stems; nine nests. No parasites.

Ashmeadiella inyoensis Michener. Nevada: Nixon. Old galls on *Tetradymia*; one nest. No parasites.

Ashmeadiella meliloti Cockerell. Nevada: Nixon. Trap stems; one nest. No parasites.

Ashmeadiella rufipes Titus. California: Glamis. Trap stems; two nests. No parasites.

Ashmeadiella timberlakei Michener. Nevada: Verdi. *Sambucus* stems; three nests. No parasites.

Callanthidium illustre (Cresson). California: Arroyo Seco Camp. Holes in wood; five nests. No parasites.

Chelostoma phaceliae Michener. Nevada: Verdi. *Sambucus* stems; six nests. No parasites.

Dianthidium ulkei perterritum Cockerell. Arizona: Sabino Canyon. Holes in wood; two nests. No parasites.

Dianthidium ulkei ulkei (Cresson). Nevada: Verdi. *Sambucus* stems and holes in wood; four nests. PARASITES: *Eusapyga verticalis* (Cresson) (Sapygidae).

Hoplitis biscutellae (Cockerell). California: 18 miles west Blythe, Glamis. Trap stems; 19 nests. PARASITES: *Nemognatha macswaini* Enns (Meloidae).

Hoplitis brachyodonta (Cockerell). Nevada: Reno. Trap stems; one nest. PARASITES: *Stelis sexmaculata* Ashmead (Megachilidae).

Hoplitis colei (Crawford). Nevada: Reno, Mustang, Nixon. Old galls on *Tetradymia* and trap stems; 70 nests. PARASITES: *Nemognatha scutellaris* LeConte (Meloidae); *Stelis sexmaculata* Ashmead (Megachilidae).

Hoplitis fulgida fulgida (Cresson). California: Arroyo Seco Camp. Holes in wood; one nest. No parasites.

Hoplitis fulgida platyura (Cockerell). Nevada: Verdi. *Sambucus* stems; 23 nests. PARASITES: *Anthrax irroratus* Say (Bombyliidae); *Leucospis affinis* Say (Leucospidae); *Sapyga aculeata* Cresson (Sapygidae).

Hoplitis grinnelli Cockerell. Nevada: Nixon, Patrick. Trap stems; four nests. PARASITES: *Nemognatha scutellaris* LeConte (Meloidae); *Stelis sexmaculata* Ashmead (Megachilidae).

Hoplitis hypocrita (Cockerell). California: Putah Canyon. Nevada: Verdi, Mustang. *Foeniculum*, *Eriogonum*, and trap stems; five nests. PARASITES: *Nemognatha scutellaris* LeConte (Meloidae); *Aritranis imitator ruficauda* Townes (Ichneumonidae); *Stelis* sp. (Megachilidae); *Eurytoma* sp. (Eurytomidae).

Hoplitis producta gracilis (Michener). Nevada: Reno, Verdi. California: Putah Canyon, Davis. *Sambucus*, *Eriogonum*, *Foeniculum*, and trap stems; 15 nests. PARASITES: *Stelis sexmaculata* Ashmead (Megachilidae); *Eurytoma stigma* Ash-

mead (Eurytomidae); *Aprostocetus* sp. (Ichneumonidae); *Chrysura sonorensis* (Cameron) (Chrysididae); *Sapyga aculeata* Cresson (Sapygidae).

Hoplitis sambuci Titus. California: Putah Canyon, Antioch. *Sambucus* stems; three nests. No parasites.

Megachile brevis Say. California: Davis. Nevada: Mustang. *Sambucus* and trap stems; 21 nests. PARASITES: *Coelioxys salinaria* Cockerell (Megachilidae); *Leucospis affinis* Say (Leucospidae); *Anthrax irroratus* Say (Bombyliidae).

Megachile concinna Smith. California: Shafter, Putah Canyon. *Sambucus* stems and bamboo; 17 nests. No parasites.

Megachile gemula Cresson. Nevada: Verdi. *Sambucus* stems; three nests. No parasites.

Megachile gentilis Cresson. Nevada: Verdi. California: Antioch, Putah Canyon, Davis. *Sambucus* stems; 26 nests. PARASITES: *Anthrax daphne* (Osten Sacken), *Anthrax melanopogon* (Bigot) (Bombyliidae); *Leucospis affinis* Say (Leucospidae); *Aritranis notata sierrae* Townes (Ichneumonidae).

Megachile montivaga Cresson. California: Palo Verde, 18 miles west Blythe. Nevada: Mustang, Patrick, Verdi. *Sambucus* and trap stems; 10 nests. PARASITES: *Phaenacra* sp. (Pteromalidae).

Megachile rotundata (Fabricius). Nevada: Mustang. California: Davis. *Sambucus* stems, holes in wood and old *Sceliphron* nests; 21 nests. PARASITES: *Sapyga pumila* Cresson (Sapygidae); *Monodontomerus montivaga* Ashmead (Trypidae).

Osmia kincaidii Cockerell. Nevada: Verdi. California: Boca. *Sambucus* and trap stems; 20 nests. PARASITES: *Chrysura halictula* (Gribodo); *C. sonorensis* (Cameron); *Nemognatha scutellaris* LeConte (Meloidae); *Leucospis affinis* Say (Leucospidae); *Epistenia* sp. (Pteromalidae).

Osmia lignaria Say. California: Arroyo Seco Camp, Putah Canyon. Nevada: Mustang. Holes in wood; seven nests. PARASITES: *Stelis* sp. (Megachilidae); *Sapyga augustata* Cresson (Sapygidae).

Osmia marginata Michener. California: 18 miles west Blythe, Coyote Creek (near Borego). Nevada: Reno. Trap stems; three nests. PARASITES: *Nemognatha macswaini* Enns (Meloidae).

Osmia pikei Cockerell. Nevada: Mustang. Holes in wood; one nest. No parasites.

Proteriades bullifacies (Michener). Nevada: Nixon. *Tetradymia* stems; two nests. PARASITES: *Anthrax irroratus* Say (Bombyliidae); *Stelis* sp. (Megachilidae).

Proteriades mojaviensis (Michener). Nevada: Nixon. Old galls on *Tetradymia*; one nest. No parasites.

Proteriades xerophila (Cockerell). California: Glamis, 18 miles west Blythe. Trap and dead *Oenothera* stems; eight nests. No parasites.

APIDAE

Xylocopa tabaniformis orpifex Smith. California: Yosemite Valley, Mariposa County; redwood board under a pipeline. PARASITE: *Anthrax tigrinus* (DeGeer) (Bombyliidae).

PARASITES FROM HOSTS NOT DETERMINED TO SPECIES

Omalus aeneus (Fabricius) reared from cells of *Pemphredon* sp. Nevada: Mustang.

- Gasteruption assectator* (L.) reared from cells of *Hylaeus* sp. Nevada: Verdi.
Chrysis irwini Bohart reared from cells of Eumenidae. California: Boca.
Grotea mexicana Cresson reared from cells of *Ceratina* sp. Mexico: Tuxpan.
Dibrachys sp. reared from cells of *Trypoxylon* sp.
Sphaerophthalma (*Photopsis*) *nixonensis* Ferguson reared from cells of *Proteriades* sp. Nevada: Nixon.

CHALCIDOIDEA

- Perilampus hyalinus* complex reared from *Amobia floridensis* Townsend (Sarcophagidae). Nevada: Verdi.
Eurytoma sp. reared from *Chrysis* sp. (Chrysididae). Nevada: Verdi.
Eurytoma stigmii Ashmead reared from *Trichrysis doriae* (Gribodo), *Chrysis parkeri* Moore (Chrysididae). Nevada: Verdi.
Dibrachys sp. reared from *Chrysis derivata* Buysson (Chrysididae). Nevada: Verdi.
Dibrachys cavus (Walker) reared from *Amobia floridensis* Townsend (Sarcophagidae). Nevada: Verdi.
Epistenia sp. reared from *Stelis sexmaculata* Ashmead (Megachilidae); *Chrysis* sp., *Trichrysis* sp. (Chrysididae). Nevada: Verdi, Mustang.
Microdontomerus anthidii (Ashmead) reared from *Stelis sexmaculata* Ashmead (Megachilidae). Nevada: Nixon.
Diomorus zabriskiei Cresson reared from *Omalus* sp. (Chrysididae). Nevada: Verdi.
Perilampus sp. reared from *Omalus janus* (Haldeman) (Chrysididae). Nevada: Verdi.
Tetrastichus sp. reared from Sarcophagidae. Nevada: Nixon.
Leucospis affinis Say reared from *Stelis sexmaculata* Ashmead (Megachilidae); *Sapyga pumila* Cresson (Sapygidae). Nevada: Nixon, Mustang, Patrick.

Immature and Mating Behavior of *Neocompsa alacris* (Bates)

(Coleoptera : Cerambycidae)

JOHN A. CHEMSAK

University of California, Berkeley

The tribe Iridionini is represented by a large number of species and is found predominantly in the Neotropics. Information on biology and habits is lacking for the vast majority of the group and host plant associations are known for only a few species.

Neocompsa alacris, a species commonly attracted to light in Mexico, occurs from Sonora to Oaxaca. On the west coast of Mexico, at least, it is found in association with the thorn forests from June to September. During the summer of 1965 from late June to early July, this species was found in dead wood of *Lonchocarpus* (Leguminosae), 5 miles north of Mazatlán, Sinaloa, Mexico. The area is a typical thorn forest



Parker, Frank Downs and Bohart, R. M. 1966. "Host-parasite associations in some twig-nesting Hymenoptera from western North America." *The Pan-Pacific entomologist* 42, 91–98.

View This Item Online: <https://www.biodiversitylibrary.org/item/227638>

Permalink: <https://www.biodiversitylibrary.org/partpdf/240569>

Holding Institution

Pacific Coast Entomological Society

Sponsored by

IMLS LG-70-15-0138-15

Copyright & Reuse

Copyright Status: In copyright. Digitized with the permission of the rights holder.

Rights Holder: Pacific Coast Entomological Society

License: <http://creativecommons.org/licenses/by-nc-sa/4.0/>

Rights: <https://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.