OBSERVATIONS ON THE HABITS AND PREY OF EUCERCERIS RUFICEPS SCULLEN

(Hymenoptera, Sphecidae)

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The genus *Eucerceris* is confined to the western hemisphere and twenty-eight species are now recognized from America north of Mexico (Scullen, 1939, 1948, 1951). Until 1939, nothing had been published concerning the nesting habits or prey of any of these species. In that year Scullen (1939:12) published observations on the habits of *Eucerceris flavocincta* Cresson nesting in two sites at Breitenbush Hot Springs, Oregon, in July, 1934. The females were provisioning their nests with the weevil, *Dyslobus lecontei* Casey. Scullen also reported that Bridwell had observed the same species two years previously at Detroit, Oregon, preying upon *Dyslobus segnis* Le Conte. In the same publication (Scullen, 1939:40) records the capture in North Dakota of a female of *Eucerceris superba* Cresson carrying a specimen of *Ophryastes sulcirostris* (Say). The latter is an otiorhynchine weevil related to *Dyslobus*.

Eucerceris ruficeps Scullen (1948) was described from females collected at Antioch, California, and the observations reported here were made at the type locality in the fall of 1952.

The general area in which *Eucerceris* was encountered is the sand dune region just east of Antioch, along the south shore of the San Joaquin River. Although most of the area is covered by loose and shifting sand, occasional hard-packed areas occur throughout. In three such areas, the authors discovered six females of *E. ruficeps* which had appropriated abandoned burrows of the Halictine bee, *Lasioglossum (Sphecodogastra) aberrans* (Crawford)[2].

This bee nests throughout the area in late spring and early summer and its burrows are borrowed, later in the summer, by a number of other bees and wasps. Each burrow of the bee consists of a single vertical shaft which varies in depth from about thirty to forty-five centimeters.

The burrows of the *Eucerceris* exhibited the following features: About one centimeter within the entrance the female wasp constructs a thin plug across the burrow with a small passage through

[1] The writers wish to express their appreciation to G. A. Marsh for assistance in making some of the field observations reported here.

[2] Identified by P. D. Hurd, Jr.

one side of the plug. At this depth the diameter of the burrow is about six millimeters, the hole in the plug about three millimeters. The wasp also constructs a loose plug of moist sand at a depth of twenty to twenty-three centimeters and at the same point constructs a lateral tunnel away from the original bee burrow. The lateral unnel continues downward at angles of from thirty to sixty degrees with the vertical axis. The total length of the lateral tunnel varies considerably in different burrows but usually terminates at a depth of from 29 to 42 centimeters. Another plug of moist sand about four centimeters in length is constructed near the bottom of the lateral tunnel and the female wasps pack the weevils which they collect into this plug. Since the weevils in the plugs are always able to move, those in the cells immobile, it is presumed that the wasps either do not paralyze them until they are ready to place them in a cell or that the sting has a delayed effect upon the nervous system.

Females were never seen in the process of capturing weevils but some data are available on the plant relationships of the two weevils involved. Adults of the weevils, *Dysticheus rotundicollis* Van Dyke and *Sitona californicus* Fahrens, do not occur on the same species of plant. Both males and females of *Dysticheus* occurred near the nesting site on flowers of the composite, *Gutierrezia californica* T. & G. In another area they were found both on *Gutierrezia* and less commonly on another composite, *Senecio douglasii* D.C. *Sitona* were collected only from *Lotus scoparius* (Nutt.) Attley, although they may well occur also on other legumes growing in the locality. Both species of weevils were active in early August, when observations were made, but specimens of *Sitona* appeared to be less common than *Dysticheus*. In addition, the three *Eucerceris* burrows which were excavated contained a total of 106 *Dysticheus* and 82 *Sitona*.

The first burrow excavated contained a female wasp in fresh condition and four cells at depths of 28 to 31 centimeters. The contents of three of the cells had molded while the fourth cell contained a cocoon and living larva. One of the moldy cells contained only 6 *Dysticheus,* the other two, 15 each. The cell with the cocoon had fragments of 14 additional *Dysticheus*. The absence of cells containing freshly captured weevils raises some question as to just when the provisioning of the cells took place, although their association with the *Sphecodogastra* burrow establishes them as having been provisioned in the current year.

The second burrow was located when a female carrying a *Dysticheus* alighted about three feet from the first burrow which was being excavated at the time. This female was later captured, along with a second female, at a depth of about 20 centimeters in the lateral tunnel. Two moist sand plugs containing weevils were also encountered. The first at 29 centimeters contained two living *Sitona*, the second at 39 centimeters contained eight living *Dysticheus*. Four cells associated with the burrow were also excavated. One cell at 30 centimeters had been provisioned with eleven *Dysticheus* which had been destroyed by Tachinids. Another at the same depth contained a living larva in its cocoon surrounded by the remnants of 15 *Dysticheus*. The third cell at 36 centimeters also contained a cocoon and fragments of 2 *Dysticheus* and 20 *Sitona*. At 38 centimeters the fourth cell with 1 *Dysticheus* and 12 *Sitona* had been destroyed by Tachinids. At a depth of 21 centimeters, where the lateral branch originated, 10 puparia were found in the earth to one side of the burrow. Since six of these were pale yellow-brown and four were larger and dark reddish-brown it seems apparent that more than one species of parasitic fly was attacking this host. Unfortunately neither of the female wasps could be associated individually with the weevils stored in the plugs or in the cells.

A third burrow was discovered about a foot away from the second while the second burrow was being excavated. The contents of four cells and part of the contents of a fifth cell were uncovered at depths of 36 to 42 centimeters. One cell with a *Eucerceris* cocoon had been provisioned with 15 *Dysticheus*. Adult wasps had emerged from the other four cells which had been provisioned as follows: (1) 18 *Sitona*, (2) 16 *Sitona*, (3) 3 *Dysticheus* and 11 *Sitona*, (4) 1 *Dysticheus* and 3 *Sitona* (incomplete cell).

Unfortunately the rarity of this species and the limited time at our disposal permitted only these few observations. However, the data suggest that the *Eucerceris* wasps search for their prey on a habitat basis and that variations in provisions are due to partially exhausting one of the available sources. Furthermore, although this species is known at Antioch from about a dozen females collected in August and September, the burrow evidence might be interpreted to indicate that the species is double-brooded.

Literature Cited

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Book Review

THE ANTS OF CALIFORNIA, by Thomas W. Cook, Pacific Books, Palo Alto, Calif., XVI—462 pp., 92 figs. 1953. $10.00.

The reader is referred to the review of W. L. Brown and E. O. Wilson* for their reactions as ant specialists to this book.

In preparing this impressive, well printed book the author had a very sincere and generous purpose in mind. He wanted to provide something useful for the amateur who is often discouraged by the scattered and at times unavailable literature in a field. However, amateurs faced with this problem in studying the ants of California are at present almost non-existant and this book will do little to encourage the development of more. Indeed it may do much to discourage them. For one thing, the novice will be baffled at the outset by the lack of an adequate means of identifying ant subfamilies and genera. Cook offers three pages of line drawings of ant profiles to fill this need. Apparently the beginner is expected to compare the ant specimen in hand with the drawings and by trial and error arrive at a higher group identification. This is a fine idea but the beginner who needs such help is the one least likely to note the often slight critical differences (if any) apparent in these drawings.

Dr. Cook obviously has a great reverence for original descriptions and those he calls "revised descriptions" by subsequent workers. The great bulk of the book is due to the transcription and republication of these often useless combinations of words. It is most unfortunate to confront a beginner with such descriptions for many of them are of little value even to an expert. Dr. Cook's "naturalists of California," to whom he dedicates his book, would have been much better served by a standardized, modern redescription of each ant species together with adequate keys. This, however, would have resulted in a much smaller book.

Cook apparently assumed that the amateur is only interested in identification for little or no mention is made of such things as the technique of studying ants, making artificial nests, and conducting much-needed biological studies.

In short, the needs of California ant students are far from adequately satisfied by this book. One must commend the author, however, for his well meant purpose, the effort involved in transcribing the scattered work of others, and the personal expense in getting it published.—E. S. Ross.

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* Ent. News 64:163–164, 1953.