Biological Notes on Some Mexican Bees

(Hymenoptera: Megachilidae, Anthophoridae)

F.D. Parker

USDA-ARS, Utah State Univ. Logan 84322

In 1963 L.A. Stange and I spent several months in Mexico collecting wasps for the University of California at Davis. Several nests of bees were found during this trip. The nesting habits of four species are described here. We did not make detailed descriptions of bee nests during collecting, but we saved the nests and made the following observations from this material.

Dianthidium (Mecanthidium)macrurum (Cockerell)

(Figs. 1-4)

Nests of this large red megachilid were located attached to volcanic stones that had formed a wall bordering a field N of Yautepec, Morelos. The nests were stuck beneath, on the side, or on the top of stones. They were always sheltered by their own stone or by another one above. The bees were actively building nests in July.

Nest Construction: — The large nests were made of resin and small (2-4 mm) pebbles. The bees began the nests by forming a cell outline from resin on the substrate and then placing pebbles into the resin. The cells averaged 20 mm long and 7 mm wide and were roofed with similar material. Adjacent cells were made (Fig. 1) with the space between cells filled with similar nesting material. Most completed nests were two-storied (Figs. 2,3) and were covered with resin (Fig. 3). The time required for nest construction was considerable; for example, one nest had layers 6-pebbles deep, and was covered by 350 pebbles, and had the surface coated with resin. Three nests had the following dimensions (in cm): 6.5 wide, 4 long, 2.5 high; 7x5x2; 4.5x4x2. The number of cells and their orientation within these nests were: 5 cells on the bottom row and 2 above with entrances to bottom cells from 3 sides; 3 cells on bottom row facing 1 direction with an opposite facing cell above; 2 cells on bottom and 1 above all facing one direction.

Provisions: — All cells were provisioned with one type of pollen of uncertain identity.

Feces: — The fecal pellets were small and uniform and averaged 1 mm long and 0.5 mm thick with one end blunt and the other with a minute projection. Most pellets were bicolored and flattened against the resin walls of the cells; some were loose at the top of the cocoon.

Cocoon: — The oval cocoons averaged 13 mm long and filled the lower end of the cell (Fig. 4). First, the larvae lined the bottom with an amber layer of silk that had a cellophane-like texture; then they spun

The Pan-Pacific Entomologist 53:189-192. July 1977.

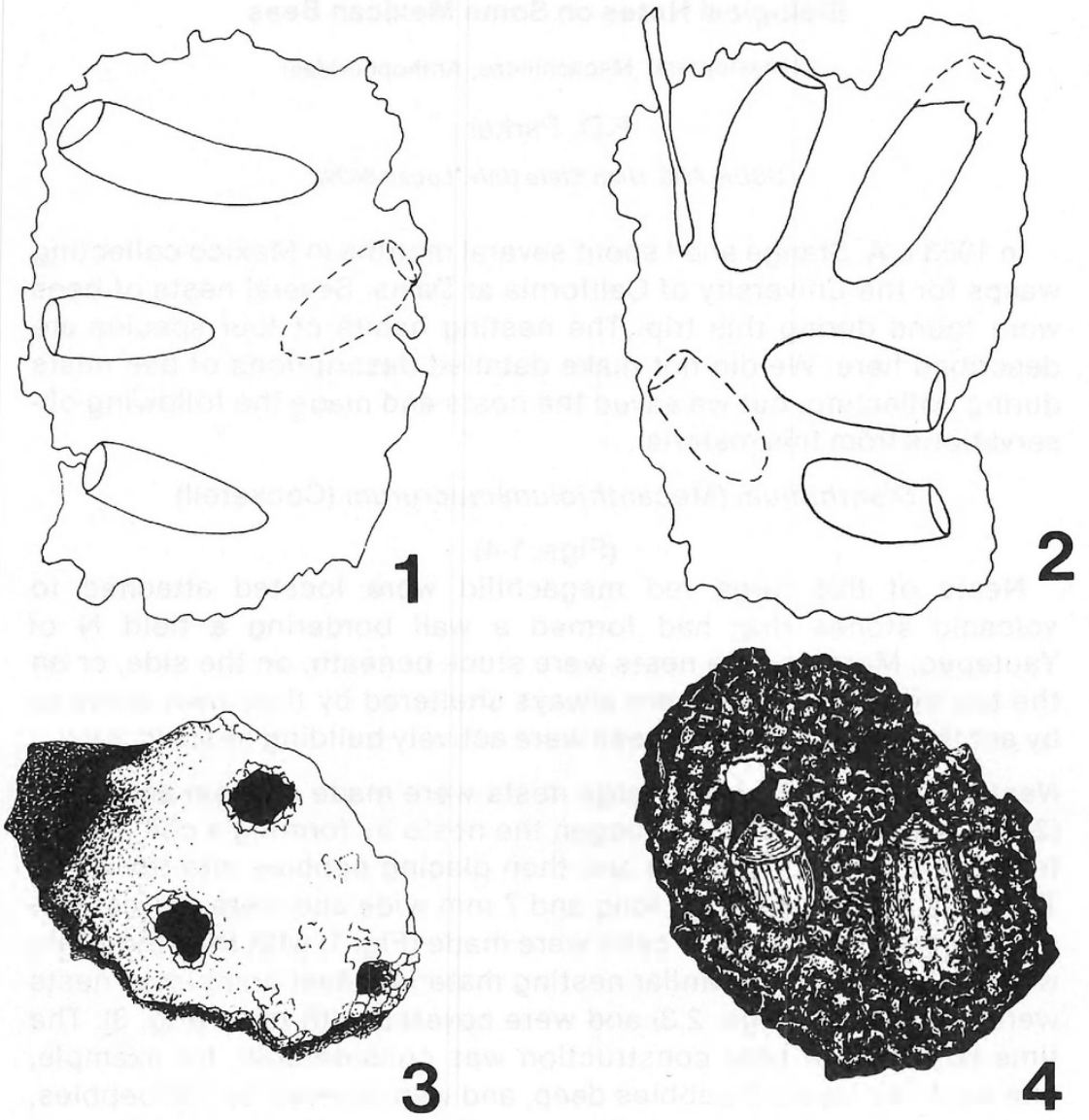

Fig. 1-4 Nests of *Dianthidium macrurum*. 1-Outline (vertical view) of 2-storied, 4-celled nest. 2-Outline (vertical view of 2-storied 5-celled nest. 3-Front view of 2-storied nest covered with resin with 3 exit holes. 4-Cell structure and cocoons inside nest.

another layer inside the first that had more silk strands evident. The top was ringed with minute woven strands spun in a circular pattern continuous from the side to the nipple. The nipple was spun with coarse, loose strands that filled its central cavity. Beneath the nipple on the inside of the cocoon was a mat of silk strands.

Sex Ratio: — Only 3 cells contained mature larvae from which 2 females and 1 male developed.

Nest Associates: — None of the cells were parasitized nor was evidence of parasitism found in old cells. This lack of parasitism may

have resulted because of the sticky resin that covered the nests; several ants were observed stuck to the nests. In older nests the resin was hard; and in these scavenger beetles (demestids) were present. Also, a cell in an old nest was used as a brood chamber for the eumenid wasp, *Parancistrocerus bravo* (Saussure).

Discussion: Species of *Dianthidium* are versatile nesters: some species make pebble-resin nests attached to leaves, twigs, and stones (Fischer, 1951; Grigarick and Stange, 1968); others nest in existing holes (Hicks, 1927); and one species is known to make burrows in the ground (Hicks, 1926). However, a universal substance used in nest construction by species of *Dianthidium* is plant resin.

Moure (1965) transferred the subgenus *Mecanthidium* from *Paranthidium* to *Dianthidium*. In the same publication he established a new genus, *Adanthidium*, for 2 other species formerly considered *Paranthidium*. One of these, *A. texanum* (Cresson) made large nests (Melander, 1902) quite similar to those I have seen *D. macrurum* build. Michener (1975) reported another species of *Paranthidium* nesting in old cells of *Melitoma*, an anthophorid that nests gregariously in clay banks.

Centris totonaca Cresson

We found a colony of this species utilizing an old nesting site of *Melitoma euglossoides* Lepeletier and Serville 11 mi. N Culican Sinaloa. The nesting site was located on a vertical mud wall of a dry arroyo. We did not record the nesting habits of this species, but we did collct numerous *Centris* cocoons that had been made in exited cells of *Melitoma*. Several females of the parasitic bee *Mesocheira bicolor* (F.) were collected as they flew about the nesting site. One female of this parasite was reared from a *Centris* cell.

Melitoma euglossoides Lepeletier and Serville

As mentioned previously, an old nesting site of this specis was located N of Culican. Many old but intact cells were collected and opened. Several of these cells contained dead host bees or parasites that had failed to exit. Three of the parasites were identified as the following species: the bee flies *Anthrax limatulus larrea* Marston and *A. cintalapa* Cole and the meloid beetle *Nemognatha chrysomeloides* (L.).

Acknowledgements

I wish to thank C.D. Michener (University of Kansas) who identified the bees and R. M. Bohart (University of California, Davis) who determined the eumenid. Mr. J. Brogdon made the illustrations. I would like to thank G.E. Bohart and W.J. Hanson (Utah State University) for their manuscript review.

Literature Cited

Fischer, R.L. 1951. Observations on the nesting habits of Megachilid bees. J. Entomol. Soc. 24:46-50.

Grigarick, A.A., and L.A. Stange. 1968. The pollen-collecting bees of the Anthidiini of California. Bull. Calif. Insect Surv. 113 p.

Hicks, C.H. 1926. Nesting habits and parasites of certain bees of Boulder County, Colorado. Univ. Colo. Studies 15:217-252.

Hicks, C.H. 1927. Parasites and habits of *Dianthidium pudicum* Cresson, Psyche 34: 193-198.

Moure, J.S. 1965. New placements for some species of *Paranthidium.* Proc. Entomol. Soc. Washington 67:29-31.

Melander, A.L. 1902. The nesting habits of *Anthidium.* Biol. Bull. 3:27-32.

Michener, C.D. 1975. Nests of *Paranthidium jugatorium* in association with *Melitoma taurea.* J. Kans. Entomol. Soc. 48:194-200.

ZOOLOGICAL NOMENCLATURE

The following Opinions have been published recently by the International Commission on Zoological Nomenclature, c/o British Museum (Natural History), Cromwell Road, London SW7 5BD, United Kingdom. (see Bulletin Zoological Nomenclature Volume 34, part 1)

Opinion No. 1083 (p. 30) *Pisaurina* Simon, 1898 (Arachnida, Araneae) conserved under the plenary powers.

Opinion No. 1087 (p. 40) *Pamphilius viriditibialis* Takeuchi, 1930 designated under the plenary powers as type-species of *Onycholyda* Takeuchi, 1938 (Insecta, Hymenoptera).

Opinion No. 1091 (p. 50) *Geloius decorsei* Bolivar, 1905 (Insecta, Orthoptera) designation of a neotype.

Opinion No. 1092 (p. 53) *Dicyrtoma* Bourlet, 1842 and *Dicyrtomina* Börner, 1903 (Insecta, Collembola): designation of type-species under the plenary powers.

The Commission cannot supply separates of Opinions.