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California Bees and Their Parasites

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(description by Ashmead)

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Charles D. Michener

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Ashmeadiella

CHALICODOMA CALIFORNICA, Ashmead, n. sp.

is bee is tolerably common around Los Angeles, and has probably ptured by other collectors in California, as I have observed it for a r of seasons. Though smaller than the typical *Alcidamea producta*, o closely resembles it in general appearance that it is very apt to be ded with it. At my special request Mr. Ashmead examined it as I tain from the structure of its nest and the different time of hatching was not identical with *Alcidamea producta*, which is likewise com- re. As the result of Mr. Ashmead's investigations the first United representative of this genus is here described:

le and female, length 5 to 6 mm. In structure, colour, pubescence and re this bee is very similar to *Alcidamea producta*, Cr., but it is smaller, lli being arranged on a slight curved line and not in a regular triangle, ral ocelli being twice as far from each other as from the front ocellus; median cell is slightly shorter than the median, the transverse vein being not quite interstitial with the basal vein; while in the e antennæ are simple as in Megachile, with the terminal abdominal t triemarginated and toothed.

e female is black, somewhat finely and closely punctate; the face and below the antennæ, as well as the thorax, clothed with a rather whitish pubescence, that on the thorax above being less dense, the tum nearly bare, and with a more or less fulvous tinge. Legs ly outwardly with a whitish pubescence; claws simple. Abdomen vex above, closely punctate, each segment narrowly but densely d at apex with a short whitish pubescence; ventral scopa dense. subfuscous, tegulæ, stigma and veins black, the first submarginal cell at longer the second. Antennæ 12 jointed, the pedicel longer than t flagellar joint, the latter obconical, the second flagellar joint scarcely long as the first transverse; the third and fourth also transverse, but longer than the second; the following joints very slightly and gradu- creasing in length.

e male is very similar to the female except the pubescence on the longer and denser, as well as on the head beneath, especially along la; claws cleft; antennæ 13 jointed, the first and third flagellar joints about equal a little longer than wide, the second a little wider than

long, while those beyond are all longer than the third. The terminal do
sal abdominal segment at apex has three deep rounded emarginations, t
middle one forming two rather long blunt teeth, the lateral or outer angl
of the other two being acute; hypopygium with a transverse carina at ape

Hab. California. This is the first species of this genus to be describ
in our fauna, and I have examined several specimens besides those receiv
from Dr. Davidson, all from California. The genus seems to be interme
iate between *Megachile*, Latr. and *Alcidamea*, Cress.

The cells as shown in the illustration closely resemble those of *Alcid
mea producta* (see Entomological News, Sept., 1896), differing only
length and in the nature of the material which caps the series of cells. T
cells measure ½ cm. in length, they are truncate at each end with
thin tough disc of clay between each cell, the whole capped over at t
external end by a disc of clay ½ mm. in thickness.

When the hollow twig occupied by the nest is wider than usual the c
are adapted thereto and are frequently of greater breadth than leng
closely compacted and devoid of the usual disc between each cell.

In the only cell in which I had the opportunity of observing the ea
development of this insect the egg was laid on a waxy mass of bee food
September 22. This egg hatched out on September 27. On October 12
enveloping cocoon was completed. The adult bees hatched out from
middle of June to the middle of July.

The parasites affecting this bee are very few in number and are represen
by three species *Sphaeropthalmia anthophoræ*, Ashm.; *Chrysis parv*
Fabr., and *Stellis 6-maculata*, Ashm., all of which attacked the larvæ be
pupation; those of the latter hatched out in March and April.

ANTHOPHORA MONTANA, Cress. and its Parasites.

This bee is common enough in this neighborhood though its nesting
are not so frequently met with, but where found the cells are abundant
this species has the habit so common with this group of nesting is large
onies. The nesting site preferred is that of a bank or knoll where the
is very fine and of putty-like consistency when moist. Tunneling in so
this nature seems comparatively easy and its toughness keeps the open
patent and free from debris. When the level ground is chosen the tun
are driven perpendicularly for from six to eight inches, the cells being
tered irregularly in laterals along the sides chiefly near the base. From
number of cells of apparently the same age, and from other observation
is apparent that more than one bee utilizes the same tunnel. Having e
vated a cell the parent bee utilizes the material removed to work over
fashion into a cell as shown in the illustration. These cells are set v
cally in the soil, and when completed measure on an average, exter
eleven lines in length and six lines in greatest width. The upper end
smaller diameter than the lower, and is neatly closed by a clay disc
lines thick and concave above. I have bred a large number of these be
the last three years and their life history is as follows:

The bees begin to hatch out in the second week of May, and by the
of the month all are hatched. They immediately go to work cleanin
the old cells and tunnels and for the next six weeks the place is as live
a bee hive all seemingly occupied in storing their cells. By the first of
their work is completed, not a parent bee is to be seen, and on excava
the cells are almost all found to be occupied by nearly full grown la

The larva spins no cocoon, but lies inactive until April, when it pupates and
completes the cycle of its existence.

The number of these cells that is affected by parasites is surprisingly
great. In some colonies half, at least, are affected by parasites of which the
most common is a *Sphæropthalmia*, of which a description is here appended.
The eggs of this parasite are deposited with that of the parent host before
the cell is sealed up, and they probably share with the bee larvæ the food
stored in the cell, and only attack the bee when it is fully grown and which
seldom is able to completely devour. After about a month the larva spins
a cocoon of papery texture of a cream or brown colour, fastened upright in
cell occupying about half the cell. In the larval state it is of a light pearly
colour and is very active in its movements until just before pupating. Those
deposited in 1895 hatched out at irregular intervals from June to November
of succeeding season. The next most common parasite is *Melecta Cali-
fornica*, of which a few are always to be found in every colony. These are
easily distinguished on opening the cells, as they spin a cocoon which fully
occupies the cavity, whereas the Anthophora larva is always naked. They
hatch out in June. They, too, are sometimes attacked by the *Sphæroph-
thalmia anthophora* when their cocoon is partially formed. The bee fly,
Systramoeba simson, may be frequently observed hovering around the cell
entrances, but, though I have found quite a few bee-fly pupa, I have only
succeeded in rearing to maturity 4 specimens.

Anthophora has in common with some other members of this family a
curious habit of building a tower or chimney over the opening of their bur-
rows. This tower when perfect is from one to two inches high and curved
backwards at the extremity as shown in the illustration, which is an actual
cast of one discovered last year. Towers more or less complete are to be
found over almost every tunnel, and are constructed of fragments of clay
loosely pieced together. Occasionally the tower is smoothly and well
finished, but in the majority of instances when the fragments of clay are at-
tached they are left untrimmed externally so that the whole looks decidedly
ragged, or with the continuity of the pieces so broken as to resemble lattice
work rather than a tube wall. What object the bee has in view in construct-
ing this tower I have not been able satisfactorily to determine. If it were
built as a protection against the winter rains it is but a sorry defense; as
protection against parasitic insects it is undoubtedly useful, but against
any particular enemy this rampart is erected I am profoundly ignorant.

Appended is Mr. Ashmead's description of the new parasite referred to.

Sphærophthalmia anthophoræ, Ashm., n. sp.

Female, length, 10 mm. Resembles *S. coccineohirta*, Blake; the head thorax
and the abdomen above and below, except the large second ventral
segment, being clothed with a dense bright coccineus pubescence but
not so long as in that species. Eyes, mandibles except at base, sides
of thorax and legs black. Scape of antennæ, sides of thorax
(sparsely), legs and the large second ventral segment clothed with
coarse glittering white hair. Palpi ferruginous; flagellum brown black.
Head viewed from above subquadrate, shaped as in *S. Californica*, Rad.,
finely reticulately punctate, flagellum about 2-1-2 times as long as the
pedicel 2½ times as long as thick at apex; first joint of flagellum
longer than the pedicel and the longest joint obconical, about as long
as united. Thorax above rugosely punctate but the sculpture is not
seen on account of the density of the pubescence; mesopleura smooth

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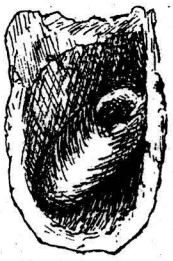

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No. 1. Cell of Anthophora montana.
No. 2. Cocoon of Sphœrophthalmia in cell of Anthophora.
No. 3. External tower over entrance to tunnel.
No. 4. Nest of Chalicodoma Californica, Ashm.