

A CATALOGUE OF THE BEES OF CALIFORNIA.

BY T. D. A. COCKERELL, EAST LAS VEGAS, N. MEX.

In the Report of the Agricultural experiment station of the University of California for 1898-1901, recently published, Mr. Carroll Fowler gives an account of the long-tongued bees of California. This is a very useful paper, so far as it goes, and Mr. Fowler has been able to make important additions to our knowledge of California bees. Unfortunately, however, the paper was prepared in 1899, and has not been brought up to date; consequently it omits numerous species recorded since that year, and is not altogether modern in the matter of generic nomenclature. It also omits several species published before 1899, and in a good many cases the names of species are incorrectly spelled. In some cases, I am inclined to doubt the identification of the species, but unless I have actual knowledge to the contrary, I must for the present treat all published records as correct.

The list here presented includes also the short-tongued bees of California, for completeness' sake. It need hardly be said, that we know comparatively little about California bees; it is quite certain that any student who takes up this group in California will find very numerous new species. The list now offered is intended to be of service to such a student or students, as it is hoped that the publication of Mr. Fowler's paper will have created an interest in the bees.

COLLETES Latr.

americana Cr., La Jolla.
californica Prov.

PROSOPIS Fabr. (cf. Entom., 1898, p. 218.)

polifolii Ckll., Mt. Lowe.
coquillettii Ckll., Los Angeles Co.
bakeri Ckll.
ruidosensis Ckll., var.
suffusa Ckll., var.
tridentula Ckll.
mesillae Ckll., Los Angeles Co.
varifrons Cr.

HALICTUS Latr.

californicus (Prov.).
farinosus Sm.
titusi Crawf., San Diego. Allied to *H. trizonatus*.

gracilis Rob.
tegularis Rob. (belongs to *Chloralictus* Rob.).
armaticeps Cr.

SPHECODES Latr.

mandibularis Cr., San Pedro.

AGAPOSTEMON Sm.

femoratus Crawf.
californicus Crawf., San Pedro, etc.
texanus Cr., San Pedro.

ANDRENA Fabr.

knuthiana Ckll., Berkeley.
nigra Prov.
nigripes Prov.
phenax Ckll., only two submarginal cells.
foxii Ckll., only two submarginal cells.
chalybaea (Cr.), only two submarginal cells.

Diandrena is a new subgenus or genus for the blue species of California with only two submarginal cells; type *chalybaea*, described as a *Panurgus*. Here also belongs *A. foxii*, and, I think, *A. phenax*.

PARANDRENA Rob.

regularis (Cr.).
concinnula Ckll., So. Cal.
enocki Ckll., So. Cal.

HESPERAPIS Ckll.

eumorpha (Ckll.), near Los Angeles (Davidson).

HALICTOIDES Nyl.

saundersi Ckll.
mulleri Ckll.
virgatus Ckll.
davidsoni Ckll., San Gabriel Mts.

MICRANDRENA Ashm.

pacifica Ashm. (a smallish black species with a large reddish stigma; detailed description not published yet).

NOMIA Latr.

Two undescribed species from California are in the National museum, bearing MS. names by Ashmead. One is near *bakeri*; the other near *foxii* but larger, though not nearly so large as *nortoni*.

SPINOLIELLA Ashm. (cf. Ann. mag. nat. hist. Jan. 1901, p. 129).

edwardsii (Cr.).
scutellaris (Fowler).
visaliensis (Fowler).
anthidius (Fowler).
zonalis (Cr.).
cincta (Cr.).

CALLIOPSIS Sm.

californicus Cr.
obscurus Cr.

PANURGINUS Nyl.

cressoniellus Ckll.
albitarsis (Cr.).

HYLAEOSOMA Ashm. (cf. Ann. mag. nat. hist. July, 1902, p. 42).

atriceps (Cr.).

PERDITA Sm.

claypolei Ckll., Mt. Lowe.
rhois Ckll., San Diego.
rhois reducta Ckll., San Diego.
californica (Cr.).
interrupta Cr.
tresignata Ckll.

NOMADA Fabr.

citrina Cr.
interruptella Fowler.
obliquella Fowler.
obscura Fowler.
rivalis Cr.
suavis Cr.
rubrica Prov. (Fowler makes this a var. of *bisignata*, but Robertson has shown that *bisignata* cannot be certainly recognized).
crotchii Cr.
edwardsii Cr.
melliventris Cr.
opposita Cr.
vinnula Cr.
civilis Cr.
flavipes Prov.
erythraea Dalla Torre (*rubra* Prov.).
fragilis Cr.
vineta Say.
lepida Cr.
bisignata "Say," Fowler.
formula Viereck, San Pedro.

NEOPASITES Ashm.

fulviventris (Cr.).

EPEOLUS Latr.

compactus Cr.
nigriceps Sm.

occidentalis Cr.
superbus Prov.
californicus Cr.
faceatus Prov.

TRIEPEOLUS Rob.

concavus (Cr.).

MELECTA Latr.

californica Cr.

ZACOSMIA Ashm.

maculata (Cr.), San Pedro.

BOMBOMELECTA Patt.

edwardsii (Cr.).
separata (Cr.).
thoracica (Cr.).

STELIS Panz.

laticincta Cr.
sexmaculata Ashm.

OSMIA Panz.

californica Cr.
cobaltina Cr.
maura Cr.
quadriceps Cr.
exigua Cr.
atriventris Cr.
dubia Cr.
purpurea Cr.
lignaria Say.
nigrifrons Cr.
brevis Cr.
albiventris Cr.
rustica "Cr." Fowler (Robertson says that
rustica is identical with *albiventris*).

MONUMETHA Cr. (genus hardly distinct from
Osmia).

imperfecta Prov.

HERIADES Spin.

odontura Ckll., near Los Angeles.
glaucum Fowler.

albicinctum Prov., probably an *Ashmeadiella*.
semirubra Ckll., not a true *Heriades*.

ASHMEADIELLA Ckll.

californica (Ashm.), described under *Chalicodoma*.

ALCIDAMEA Cr.

uvulalis Ckll., Mojave Desert.
simplex (Cr.) (*producta* Cr.).

ANDRONICUS Cr.

hesperius Ckll., sp. nov. ♂. About 12 mm.
long, black, closely punctured; wings
smoky; flagellum brown beneath; tarsi with
short reddish hair. Clypeus with the anterior
border thickened and faintly concave;
scape stout; flagellum like that of *ALCIDAMEA*,
but not hooked at the tip; first ventral
segment of abdomen produced into a
backwardly directed spine at the middle of
its posterior margin; seventh dorsal segment
subtruncate with rounded edges.
Rock Creek, Mojave Desert.

CHELOSTOMA Latr.

californicum Cr.
australe Ckll., near Los Angeles.

ANTHIDIUM Fabr.

atriventre Cr.
emarginatum Say.
maculosum Cr.
tricuspidum Prov.
collectum Huard (*compactum* Prov.).
californicum Cr.
edwardsii Cr.
palliventre Cr.
illustre Cr.
maculifrons (Sm.?), Fowler.

DIANTHIDIUM Ckll.

consimile (Ashm.).
ehrhorni (Ckll.), Mojave Desert.

MEGACHILE Latr.

occidentalis leucotricha Ckll., near Los
Angeles.

fidelis Cr.
 fidelis concinnula Ckll.
 davidsoni Ckll., near Los Angeles.
 angelarum Ckll.
 vidua Sm. (*frigida* Sm.).
 latimanus Say.
 pugnata Say.
 montivaga Cr.
 brevis Say.
 exilis Cr. (*studiosa* Cr.).
 frugalis Cr., San Gabriel Mts., Rock Creek,
 Mojave Desert (Davidson), near Los An-
 geles (Davidson).
 manifesta Cr., var. Banning, Riverside Co.
 pruina Sm., Catalina Island and near Los
 Angeles (Davidson).

LITHURGOPSIS FOX.

apicalis (Cr.), var. opuntiae Ckll., ♂, Palm
 Springs, Colorado Desert (Davidson).

CERATINA Latr.

dupla Say.
 tejonensis Cr.
 acantha Prov.
 arizonensis Ckll., Mt. Lowe.

MELISSODES Latr.

actiosa Cr.
 californica Cr.
 personatella Ckll., La Jolla.
 lupina Cr.
 nigrifrons Cr.
 stretchii Cr.
 olivacea Cr. ("Appears to be related to the
 genus *Ancyloscelis* in neuration and length
 of tongue; however, the ♂ has the clypeus
 yellow; the abdomen in both sexes is
 covered with a dense appressed pubes-
 cence like the male of *Eutechnia grisella*,
 and egg-shaped; the claws are blunt and
 cleft in both sexes."—H. L. Viereck, litt.
 1901).
 menuacha Cr.
 tepida Cr.
 obliqua Say.
 montana Cr., San Pedro, La Jolla.

DIADASIA Patt.

bituberculata (Cr.), described under *Melisso-*
des. Mr. Viereck tells me it is a *Diadasia*.
 nerea Fowler.
 cinerea Fowler.
 enavata Cr.
 albovestita Prov.
 tricincta Prov. (Fowler says this is *enavata*).
 rinconis opuntiae Ckll., San Pedro.
 friesei Ckll., So. Cal.
 australis Cr., San Bernardino.

XENOGLOSSA Sm.

strenua (Cr.) (*cucurbitarum* Ckll.).
 patricia angustior Ckll., Los Angeles.

PEPONAPIS Rob.

angelica Ckll. (*pruinosa* Fowler, not Say).

SYNHALONIA Patt.

edwardsii (Cr.).
 californica Fowler.
 albicans Prov.
 albopilosa Fowler.
 frater (Cr.) (*speciosa* Cr.).
 acerba (Cr.).
 nevadensis (Cr.) (*intrudens* Cr.).

EMPHOROPSIS Ashm.

depressus (Fowler).
 miserabilis (Cr.).
 floridanus (Sm.).

There is also an undescribed species which
 Ashmead made the type of *Meliturgopsis*.

ANTHOPHORA Latr.

edwardsii Cr.
 pacifica Cr.
 urbana Cr.
 californica Cr.
 crotchii Cr.
 catalinae Ckll., Catalina I.
 exigua Cr.
 maculifrons Cr.
 quinquefasciata Prov.
 flavocincta Huard (*nigrocincta* Prov.).

curta Prov.
solitaria Rits.
porterae Ckll., Mojave Desert.

ANTHOPHORULA Ckll.

coquilletti (Ashm.).

XYLOCOPA Latr.

californica Cr.
orpifex Sm.
varipuncta Patt.
fimbriata Fabr.

CENTRIS Fabr.

hoffmanseggiae Ckll.

PSITHYRUS Lep.

californicus (Cr.).

BOMBUS Latr.

californicus Sm.
centralis Cr. (? = *flavifrons* Cr.).
proximus howardii (Cr.).
occidentalis Greene.
nigrocinctus Prov.
crotchii Cr.
morrisoni Cr.
nevadensis Cr.
fervidus Fabr.
edwardsii Cr.

APIS L.

mellifera L. (*mellifica* L.), introduced.

LIFE HISTORIES OF NORTH AMERICAN GEOMETRIDAE.—XL.

BY HARRISON G. DYAR, WASHINGTON, D. C.

Lycia cognataria Guenée. The egg has been noticed by A. P. W. Cramer and there are several good descriptions of the mature larva extant, besides a poor figure, published by Lintner. The larval stages have not been before noticed. I am indebted to Mr. H. H. Lyman of Montreal for the eggs, which hatched before arrival. The larvae fed readily on maple, but are, apparently, rather general feeders.

EGG. Elliptical, roundedly and distinctly flattened above and below, ends rounded and much alike, no distinct flattening of micropylar end nor marked depression of the other end. Reticulations distinct, in longitudinal rows, forming waved ridges, the cross striae being a little weaker than the longitudinal lines. Reticulations confused at the ends, and less strongly marked. Size $.6 \times .4 \times .3$ mm. "Color bright green. Laid loose in large numbers" (Lyman).

STAGE I. Head rounded, bilobed, full, blackish over the lobes, dull sordid on clypeus and mouth; sutures of clypeus deep, well marked; width about .3 mm. Body normal, moderately robust, whitish, becoming sordid green from the food; a dull purple, broad, subdorsal band, obscurely joined intersegmentally on the abdomen and completely so on joints 10-13, separate on thorax; a broad, diffuse, dull purplish ventral band, later resolving into a series of medioventral patches. Thoracic feet black, abdominal ones dark outwardly. Tubercles black, small, normal; setae inconspicuous. Cervical shield colored like the body, undifferentiated, but anal plate and anal leg shields triangular, broadly blackish edged.