

ON A NEW SCALE-INSECT FOUND ON PLUM.

BY T. D. A. COCKERELL, N. M. AGR. EXP. STA.

Some time ago, Prof. Gillette sent me a few specimens of an *Aspidiotus* found on plum at Cañon City, Colorado, 31st Aug., 1894. They occurred on the fruit itself. He had previously sent the species to Mr. L. O. Howard, who had written that it was apparently new. The material sent was not altogether satisfactory, owing to the fact that the insect occurs solitarily on the fruits, and has to be collected by slicing off bits of the skin. Consequently it is inconvenient to obtain it in quantity, and not very easy to nicely preserve those obtained. However, the discovery of a new *Aspidiotus* on plums in the United States was a matter of importance, and deserved the most careful consideration. It now appears, after some study and correspondence, that the species is really new, as at first supposed, and it may be introduced as follows:—

Aspidiotus Howardi, n. sp.

♀ scale circular, flat, about $1\frac{1}{2}$ mm. diam., pale greyish with a slight reddish tinge; exuviae sublateral, covered, dull orange, secretion over exuviae easily rubbed off.

♀ broadly pyriform, orange; margin of terminal portion thickened, very finely striate, showing a violet colour in some lights. Plates spine-like, sparingly branched. Median lobes very large and prominent, close together but not contiguous, obliquely truncate, slightly crenate. Second pair of lobes small, broad and low. Third pair practically obsolete. There are conspicuous "wax ducts."

This species belongs to a series with circular or nearly circular ♀ scales; and more elongated, somewhat oval ♂ scales. The covered exuviae are orange or reddish, and easily exposed by rubbing. The median lobes of the ♀ are large, the others comparatively small, or obsolete. Such species are *A. perniciosus*, Comst., *A. ancylus*, Putn., *A. punicea*, Ckll., *A. ostreaeformis*, Curt.

In *perniciosus*, one does not find the same array of plates as in *Howardi*, and there are the characteristic "incisions" between the lobes. Moreover, *perniciosus* always lacks the grouped glands.

Turning now to *ancylus*, we find a species with grouped glands when mature, but presenting also the "incisions" as in *perniciosus*. It has not, either, the same arrangement of plates as *Howardi*. *A. juglans-regiae* is clearly out of the question, by superficial appearance alone. The West

Indian *punica* differs clearly in the scale, and it will suffice to say, without further details, that *Howardi* is not identical with any known neotropical species.

Having thus satisfied ourselves that it is no known American species, nearctic or neotropical, we naturally turn to Europe. Is it *A. ostreaformis* of Curtis? I have examined *ostreaformis* from Isleworth, England, (Geo. Manville Fenn), on peach; also from Rouen, France (sent by Mr. Morgan). It is quite manifestly not *Howardi*, though in some respects like it; *ostreaformis* has the median lobes well notched without, the second lobes longer and narrower, a pair of curious tooth-like plates beyond, numerous orifices in the groups of ventral glands, etc. On the whole, *ostreaformis*, *perniciosus* and *ancylus* appear to be nearer to one another than either to *Howardi*.

Lichtenstein's *A. pyri* is presumably the *ostreaformis*, formerly confounded, as remarked, with a *Diaspis*. But he says the ♂ scale is rounded, whereas it is surely oval—at least in true *ostreaformis*, as in *Howardi*. As for other European species, I find none that will agree with our insect.

There is one other species of *Aspidiotus* that seemed very like ours, and that is *A. spinosus*, Comst., found on Camellias in the conservatory of the Dept. Agriculture at Washington, the original habitat being unknown. The food-plant suggests Japan, and when I noticed the resemblance to *Howardi* in this insect I was much interested, having already thought of the probability that our species came on Japanese fruit trees, the importation of which has lately become increasingly popular. Judging by Comstock's figure of *spinosus*, it might seem that they could not be the same; but the figure shows only one pair of lobes, the description giving second and third pairs, though stating that they are small.

At this point I should have been inclined to let the matter drop, or await further developments, but for the kindness of Messrs. Howard and Pergande, in Washington. Having put my difficulty to Mr. Howard, he turned the matter over to Mr. Pergande, who prepared the appended report. This report seems to indicate that Comstock's figure of *spinosus* is more correct than his description; but, in any case, it practically settles the difficulty as to the possible identity of *Howardi* with *spinosus*. I had not myself seen the grouped ventral glands in *Howardi*, but Mr. Pergande shows that they exist.

With regard to the name of the species, it is a pleasure to dedicate it to Mr. Howard, to whom we are so greatly indebted for information regarding parasites of Coccidæ.* The present species, *Howardi*, is infested by a dark brown Chalcidid parasite.

As to the origin of *A. Howardi*, nothing certain can yet be said, but it is still possible enough that it comes from Japan. At all events, horticulturists should be on the look-out for it, and some care should be exercised that it may not spread widely over the country. Attacking the fruit, it would surely interfere with their market value, even if not seriously injuring the tree.

Mr. Pergande, on A. Howardi and A. spinosus.

"Examined and compared typical specimens of *Asp. spinosus* with *Asp. Howardi*, with the following results:—There can be no doubt that the two are distinct species. *A. Howardi* is considerably larger than *spinosus*; measuring 1 mm. in length [= adult ♀], whereas the largest one of *spinosus* is but 0.6 mm. in length.

"The anal segment of *A. spinosus* presents the following characters:—There is but *one pair of anal lobes visible*. The spines on either side of these lobes are numerous, more or less distinctly toothed, grouped closely together and occupying the terminal third of the segment. [These spines are the spine-like plates.]

"There are but 4 groups of spinnerets, of which the anterior pair of groups is composed of 2 to 5, and the posterior pair of 2 to 4 pores. *There appears to be but one row of more or less irregularly arranged, often quite indistinct, oval pores* between the groups of spinnerets and the lateral margin.

"In *Asp. Howardi*, of which I had but a single specimen for examination, there are *two pairs of well-developed terminal lobes*; while the spines are longer and stouter than in *A. spinosus*, they are also more scattered and cover about the posterior half of the segment. There are also but 4 groups of spinnerets, the anterior pair of which is composed of from 6 to 7, and the posterior pair from 3 to 4 pores. *The oval pores are large and distinct, forming two rows*, besides a few near the anterior end of the lateral margin.

*The North American Hymenopterous parasites of Coccidæ have been described as follows:—By Howard, 44; by Ashmead, 7; by Riley, 2; by Fitch, Le Baron, Emily A. Smith, Walker, Craw and Cook, 1 each; total, 59 species. There are a few others erroneously recorded as Coccid parasites, or only doubtfully parasitic on Coccidæ.

"Of *A. spinosus*, I examined 16 specimens, all of which agree with each other in every particular, while *A. Howardi* shows distinct and marked differences." (Oct. 29, 1894.)

It will be seen from the above, that the credit of differentiating this new species is very largely due to Mr. Pergande. Although this beginning of our information concerning it is very inadequate, there will, I trust, be no further difficulty about its separation from its congeners, thanks to Mr. Pergande's excellent comparative studies. It is apparent from this and other similar instances, how great is the advantage of having the types preserved in some place where reference can be made to them. Descriptions are often imperfect, and even those by the best authors frequently omit some characters differentiating the species from others not at that time discovered.

[P. S.—I have just received the following information from Prof. Gillette regarding the occurrence of *Aspidiotus Howardi*.—"A very few scattering scales were found in one orchard at Cañon City—the owner of the orchard I do not know—and the others were all found on the fruit of a native plum tree. The tree was in the back door-yard of a Mr. Helm, and growing beside a tight board fence. Most of the scales were on plums next the fence and near the ground in the shade. Most of the fruits in that position had from one to three or four scales."—T. D. A. C.]

PRELIMINARY STUDIES IN SIPHONAPTERA.—I.

BY CARL P. BAKER, FORT COLLINS, COLO.

The following will form the first of a series of papers on the Siphonaptera, in which will be mentioned all known species, together with such new species as have come to my notice. Besides what has been drawn from the examination of a large series of specimens in my own collection, and many kindly sent me by Taschenberg, Howard, Bruner, Osborn, Comstock and others, I have borrowed freely from previous papers on the subject, and especially from Taschenberg's "Die Flohe."

The existing number of species of this order will undoubtedly be found to very greatly exceed the number already known. A large proportion of mammalian animals probably act as hosts to various species of fleas, but the list of hosts as at present known is comparatively very small indeed. The group, though certainly an interesting one, has been very much neglected. I would suggest that during the immediate future, collectors in all quarters pay particular attention to the collecting of these forms.