PARASEMIDALIS ANNÆ, ENDERLEIN, A CONIOPTERYGID NEW TO BRITAIN, WITH NOTES ON SOME OTHER BRITISH CONIOPTERYGIDÆ.

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On June 17th, 1922, when beating Scots fir at Oxshott, I noticed among the numerous Coniopteryx pygmaea present, a darker specimen which appeared to me distinct. Closer examination showed this to be a female of Parasemidalis annae, Enderlein, a species not hitherto recorded as British. This species was described by Enderlein in 1905 from a single female taken at Berlin, which he distinguished from P. fuscipennis, Reuter, mainly on the position of a cross-veinlet in the hind wing. In my specimen this cross-veinlet was correctly placed in the right hind wing for P. annae, but in the left hind wing the venation was intermediate between P. annae and P. fuscipennis. As this kind of variation is very common in the Coniopterygidae, I was anxious to settle the identity of my species. Therefore on June 24th I went again to Oxshott, and secured eight more specimens—two males and six females—by beating the pines.* These were typical P. annae or intermediate, but one female had the right hind wing as in annae, the left hind wing being as in fuscipennis.

Parasemidalis belongs to that tribe of the Coniopteryginae with subequal wings (Coniopterygini of Enderlein), and can be separated from Coniopteryx by the forking of the media in the hind wings. Two genera possess a biramous media in the hind wings, Semidalis and Parasemidalis. In Semidalis the cross-vein between fore cubitus Cu and media strikes the latter on the lower arm of fork M in both wings (Fig. 4), while in Parasemidalis this cross-vein strikes M on the stem of fork and below fork point (Fig. 6). In the field Parasemidalis can at once be recognised by its dark grey colour.

Enderlein, in his "Monograph of the Coniopterygidae," "Zool. Jahrb.," 1906, records two European species of Parasemidalis—P. annae, Enderlein, 1905, and P. fuscipennis, Reuter, 1894. The latter may, he says, be distinguished from P. annae, End.,

* Since writing, two more specimens have been taken at Oxshott by Mr. W. E. China and four more by myself.

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by the termination of the cross-vein between \( R_1 \) and \( Rs \), in the hind wing, on \( R_{2+3} \) instead of on the stem \( Rs \) (Figs. 5 and 6), by the pubescence of the wing, by the red-brown colour of the wing membrane, and by the blacker hind wing.

The position of cross-veins I regard, from my study of this family, as being very liable to variation, and I have already mentioned that one specimen of mine (♀) has one hind wing as in *annae* and the other as in *fuscipennis*. Thus the venational character, on which most stress is laid, is a poor one. As regards the pubescence of the wing I should not like to make a definite statement, but of the two species under consideration I should be inclined to place mine as *fuscipennis* on this character. The pigmentation of the wing membrane is, as a rule, very variable. In *Coniopteryx pygmaea*, End., for instance, some specimens have dark brown or blackish wings, while in others the membrane is almost colourless. This is not due to the age of the specimen. Therefore, although my specimens of *Parasemidalis* have blackish wings and not brown, I do not think much importance can be attached to this distinction. However, since they have in great majority the venation of *P. annae*, I shall provisionally consider them as such until further work shall confirm or disprove.

In all the insects examined, the more strongly chitinised parts of the body, i.e. head and appendages, thoracic sclerites, legs and tip of abdomen are blackish brown; the rest of the body, including wings, dark grey. Antennae are longer, and somewhat thicker basally, in males than in females. Number of antennal joints in two ♀♂, 31 and 32 respectively. In females the antennae are 27- to 29-jointed, but one example has the exceptional number of 32 joints. I find no records of a male of either of the two European species of *Parasemidalis* having been taken, and therefore avail myself of this opportunity of figuring the male genitalia (Fig. 9).

The whole body of the insect is covered very sparsely with the waxy powder common to the Coniopterygidae. This powder, it should be stated, is secreted by glands in definitely arranged areas on the body of all Coniopterygidae, and is rubbed over the wings by the insect shortly after emergence. This it does by scraping the abdomen with its hind femora, then rubbing these over and between the two pairs of wings. It is strange that this habit has apparently not been noticed previously, since a very similar proceeding obtains in the Aleurodidae.

The method of pairing is somewhat unusual, and for *Parasemidalis* is as follows: The male approaches the female from behind, and, pushing his head under the wings of the female, seizes her hind coxa with his jaws. Now he grasps her hind legs with his fore legs, and bending up the tip of his abdomen, pairing is effected. In this way the male is carried about, the female being able to use only her first two pairs of legs for walking.
The pair separated, in each case observed, after about five or ten minutes.

Eggs are laid on pine needles, lying attached by their flat sides. They are 4 mm. long, white in colour, oval, but rather short as compared with the eggs of other Coniopterygids. The micropylar end is drawn upwards and pointed. I shall hope shortly to be able to give further details of the life-history of this species, together with a full account of our other British species.

The Coniopterygidae are well worthy of more attention from entomologists, and present many interesting biological problems. They are semi-gregarious in habits, and where found are usually to be taken in numbers. They fly very little. Variation, especially in wing venation, is common, and as species have been largely named on such characters, the family requires much reinvestigation. Being semi-gregarious in habits, with poor locomotive powers, colonies of a form may be found on one tree differing considerably from another form of the same species found elsewhere. With a view to clearing up some of these points I have been breeding these insects in captivity and studying the forms obtained. *Semidalis* is thought to possess two British species—*S. aleuroidiformis*, Steph., and *S. curtisiana*, End. These I find are one and the same, having bred both forms from the eggs of one female. *S. curtisiana* was separated from *S. aleuroidiformis* by Enderlein on the position of the cross-vein between $R_1$ and $R_s$ in both pairs of wings. In *S. aleuroidiformis* this cross-vein strikes the radial sector on the upper arm of fork $R_{2+3}$, whereas in *S. curtisiana* it strikes the stem $R_s$. In a series of this species—I have examined more than fifty examples—one can observe all stages between the forms *curtisiana* and *aleuroidiformis*. The only other character noted by Enderlein is the tarsal ratio, and this I also find variable. The species *curtisiana* was described from females only. I therefore now figure the male genitalia (Fig. 8), which, of course, are identical for both *aleuroidiformis* and *curtisiana*. It is highly probable that *Parasemidalis fuscipennis* and *P. annae* are also one and the same. *Coniopteryx pygmaea*, End., and *C. tineiformis*, Curt., are good species, having distinct larvæ. They are, however, liable to variation, and intermediate forms occur which often render determination difficult.

With the genus *Conwentszia* I am still somewhat puzzled. We have two species, *C. psociformis*, Curt., and *C. pineticola*, End. Bagnall brought forward *C. cryptoneuris*, Bagn., as a new species in 1915. This is identical with Enderlein’s *C. pineticola*, var. *tetensi*. Bagnall mentions also the lack of pigmentation of the membrane in the outer cells of the wing, but this is quite unreliable as a character and very variable. The remaining species, *C. psociformis* and *C. pineticola*, present many difficulties. They are separated as follows by Enderlein:
Hind wings considerably reduced:
Cross-vein between $R_1$ and $Rs$ in fore wing striking the upper arm $R_{2+3}$ of fork. Antennae 38- to 48-jointed. $psociformis$, Curt.
Cross-vein between $R_1$ and $Rs$ in fore wing striking the stem $Rs$ of fork. Antennae 28- to 34-jointed. $pineticola$, End.

Both species are of similar habits. I am at present only able to distinguish between the larvæ by the fact that in $C. psociformis$ the antennæ are longer, as indeed might have been expected. The male genitalia appear to be the same in both species (Fig. 7). Intermediate forms occur. I have two $♀♂$ and one $♂$ from Heston, 1921, which have 37-jointed antennæ, and the cross-vein between $R_1$ and $Rs$ striking the latter at the fork point. These were the only examples of $Conwentzia$ taken in this locality, and evidently represent a distinct race. I have a similar but very large and well-marked example from Epping Forest. In breeding experiments I have not yet found a sufficient variation to indicate that the two species $psociformis$ and $pineticola$ are not distinct. It has been already mentioned that the Coniopterygidae are of semi-colonial habits, and this remark applies especially to $Conwentzia$, in which colonies occur completely isolated from one another when only a short distance actually separates them. Possibly the two species under consideration may have been isolated in this way. Under these circumstances we must for the present leave $Conwentzia$ as comprising two forms which, within limits, breed true.

Our British list therefore now comprises seven species:

$Conwentzia psociformis$, Curtis.

" $pineticola$, Enderlein.

$Coniopteryx tineiformis$, Curtis.

" $pygnææ$, Enderlein.

$Semidalis aleurodiformis$, Stephens, and its var. curtisiana, End.

$Parasemidalis ? fuscipennis$, Reuter, and $annææ$, Enderlein.

$Helicoconis lutea$, Wallengren.

The last species was discovered by J. W. H. Harrison in 1915, and recorded in the 'Naturalist,' 1916. He rejected Enderlein's generic name in favour of $Aleuropteryx$, Low. As I have very little experience of this form, I have provisionally retained Enderlein's genus, though it is very possibly, as Harrison says, a poor one.

Walthamstow;
July 1st, 1922.
Wings.

1. C. psociformis.
2. C. pineticola.
3. S. aleurodiformis.
4. S. aleurodiformis, var. curtisiana.
5. P. annae.
6. P. fuscipennis.

Male Genitalia.

7. C. psociformis.
8. S. aleurodiformis.
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