

research, and a long course of inquiry among men well calculated to form a right conclusion. Let me advise, then, that while we keep our eyes open in order to see for ourselves, and investigate the mystery, we do not turn scornfully away from propositions which amaze, but respectfully listen to the opinions of those who have acted as our pioneers on this unknown track, and who have been busy in searching for the truth upon a point which even now, at the end of twelve long years, comes to us as a startling novelty.

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Notes on Aphides. By F. WALKER, Esq., F.L.S.

(Continued from S. S. 1059.)

Genus 3. RHOPALOSIPHUM, Koch.

Typical species, *Aphis Persicæ*, Sulzer.—Front flat between the antennæ, which are remote from each other at the base. Nectaries clavate. In other characters like Siphonophora.

- A. Nectaries twice the length of the tail. 1. *Lactucæ*.
- AA. Nectaries thrice the length of the tail.
- A. Viviparous winged female wholly luteous. 2. *Berberidis*.
- AA. Viviparous winged female with the head and thorax black.
- A. Viviparous apterous female green or luteous. Antennæ pale.
- a. Viviparous winged female with the frontal tubercle gibbous on the inner side. Abdomen green or reddish, excepting the black spots. 3. *Persicæ*.
- aa. Viviparous winged female with the frontal tubercle not gibbous on the inner side. Abdomen luteous, excepting the brown spots. 4. *Ligustri*.
- AA. Viviparous apterous female olive-green. Antennæ brownish black. 5. *Nymphææ*.

The genus *Rhopalosiphum* is restricted by Passerini to the preceding five species, which belong to not less than four genera.

1. *R. Lactucæ*, Kaltenbach.—Kaltenbach mentions that his *Aphis Lactucæ* is erroneously cited by Koch as identical with *Siphonophora Lactucæ*. Passerini has observed it on *Picris hieracioides* and on *Cichorium endiva*. Its oviparous form, so far as is known, appears only on species of *Ribes*, where its occurrence is very irregular. A wingless viviparous female, which I have described as a variety of

R. Lactuæ with cylindrical nectaries, is supposed by Passerini to be Siphonophora Lactuæ.

2. *R. Berberidis*, Kaltenbach.—It is very remote from *R. Lactuæ* in structure and in habits, and forms a new genus, which may be thus briefly described:—

Genus LIOSOMAPHIS.

Fœmina vivipara aptera.

Corpus ellipticum, vix convexum. Frons plana. Antennæ corporis dimidio vix breviores. Nectaria subclavata, subascendentes, corpore quintuplo breviores. Cauda nectariis plus duplo brevior. Pedes graciles, breviusculi.

The wingless viviparous female.

Body rather flat, increasing in breadth from the head to two-thirds of the length, rounded from thence to the tip of the abdomen. Head flat in front. Antennæ nearly half the length of the body. Nectaries subclavate, slightly curved upward, about one-fifth of the length of the body. Tail distinct, less than half the length of the nectaries. Legs slender, rather short.

3. *R. Persicæ*, Sulzer.—This species was first noticed by Sulzer in his *Abgekürzte Geschichte der Insecten*. Passerini has identified it with *Aphis Dianthi*, *Schrank*. The reference to *Aphis Persicæ*, *Kaltenbach*, as a synonym of *A. Persicæ*, *Sulzer*, in *Ann. Nat. Hist.* Ser. 2. v. 72, is erroneous. Morren described and illustrated fully the anatomical structure of this species, and named it *A. Persicæ*, supposing that it had not been recorded. His conclusion that it migrated from another country and radiated over Belgium appears to be wrong. The winged female appeared in countless millions through various parts of Belgium from the 28th of September to the 15th of October, in 1834. Morren remarks that the winter of 1833-34, was extremely mild, and that the next summer was excessively hot and dry, there being entire months without rain. These seasons were both very favourable to the increase of Aphides. The first season enabled them to multiply incessantly without the renovation of the egg state. The next season was equally favourable for increase, as wet is very destructive to Aphides. The hot weather was also the means of the appearance of the winged form, so that, while it shrivelled the sustenance of the Aphides, it preserved their lives by enabling them to

remove to fresh food. Morren believed that this occasion was the first appearance of *A. Persicæ* in Belgium, and that all its swarms migrated from one spot. It feeds on a great variety of plants, peach leaves are not its usual food, and it abounds in Europe generally. A long continuance of hot dry weather much develops the winged viviparous form of Aphides, and the time of this result varies locally; the swarms that appeared successively here and there throughout Belgium may not have been really migratory. Their numbers, which are said to have darkened the light of day and to have hidden the walls of houses, seem to prove that they did not all radiate from one focus. Morren suggests that, as it first appeared very near the west coast, it may have come from England, and cites *Schizoneura lanigera* as an example of migration. The latter, of which one individual has been calculated to multiply to a quintillion and to thirty times that number of eggs in one year, is stated to have come from N. America to England, and to have spread thence over Europe, but there is no proof that it has migrated by long flights. Morren's opinion that in Aphides generally the viviparous *Aphis* is winged appears to be incorrect. He cites *A. Persicæ* as an exception to this rule. The fact that a cold atmosphere is the means of developing the perfect form of Aphides was noticed in 1802 by Mr. Curtis. Passerini suggests that an artificial atmosphere may be the means of continuing the preparatory state *ad infinitum*, and of thus annulling the ultimate condition. At the end of September, in 1866, the winged female of *A. Persicæ* appeared in abundance on the peach leaves at Wanstead. It is very different from the common *Aphis* of the peach.

4. *R. Ligustri*, Kalténbach.—This species is widely different in form from the type of *Rhopalosiphum*, and may be included in *Liosomaphis*, with *L. Berberidis*, till it is established as a new genus.

5. *R. Nymphææ*, Linn.—This and some others belong to a group that is quite distinct from *R. Lactuæ* and from *R. Persicæ*, and is more nearly allied to the limited genus *Aphis*. Passerini, in his 'Gli Afidi,' makes *R. Nymphææ* the type of his genus *Siphocoryne*, but in his 'Aphididæ Italicæ,' he cites *A. Xylostei* as the type of that genus.

Genus 4. MYZUS, *Passerini*.

Antennæ remote from each other at the base, seated on a short tubercle; first joint not dentate. Nectaries cylindrical, longer than the tail. In other characters like the preceding genera.

Typical species, *Aphis Cerasi*, Fabr.

- A. Viviparous apterous female wholly black or brown.
- A. Tail more or less long, never very small.
- A. Nectaries long, cylindrical, more than twice longer than the tail. 1. *Cerasi*.
- AA. Nectaries short, a little thicker at the base, hardly longer than the tail. 2. *Pyrarius*.
- AA. Tail very small or none.
- A. Viviparous winged female with a reddish abdomen. Stigma and veins whitish. 3. *Persicæ*.
- AA. Viviparous winged female with a black abdomen. Stigma and veins brown.
- a. Body black, shining. Stigma black. 4. *Lychnidis*.
- aa. Body brown, dull. Stigma pale, or slightly brown. 5. *Oxyacanthæ*.
- AA. Viviparous apterous female never black or brown.
- A. Apterous female with a rust-coloured abdomen and with a large black dorsal spot. 6. *Tanacetæ*.
- AA. Apterous female wholly green, or whitish green, or luteous lemon-colour, or ochraceous.
- A. Viviparous winged female with a brown abdomen. Apterous female whitish green. 7. *Plantagineus*.
- AA. Viviparous winged female with the abdomen never brown.
- a. Apterous viviparous tuberculate-setose above. Bristles capitate. 8. *tetrarhoda*.
- aa. Apterous viviparous female not tuberculate-setose.
- * Antennæ longer than the body. 9. *Ribis*.
- ** Antennæ shorter or not longer than the body.
- † Body orange-colour. 10. *Asclepiadis*.
- †† Viviparous apterous female green.
- ‡ Nectaries very long. Stigma gray. 11. *Lythri*.
- ‡‡ Nectaries moderately long. Stigma greenish. 12. *Mahaleb*.

1. *M. Cerasi*, Fabr.—In this vicinity, during 1866, *M. Cerasi* appeared in June and passed away in August, and reappeared in the middle part of October, when the male, which has not yet been described, was of frequent occurrence. The latter month is generally the season for the second especial swarming of Aphides, and is the time in which they should be more particularly observed, in order to determine what are permanent species and what are annual or apparent species, or are modified by the agency of the plants on which they feed and pass away without attaining the last state, and in following years are replaced by other forms whose peculiarities are also owing to their food and to local circumstances.

2. *M. Pyrarius*, Passerini.—Not recorded as British.

3. *M. Persicæ*, Passerini.—The characters by which Passerini distinguishes this species from *Aphis Persicæ*, *Fonscolombe*, will be noticed in the sequel.

4. *M. Lychnidis*, Koch.—Passerini excludes the synonyms which Koch has recorded of this species, and observes that the *Aphis Lychnidis* of authors has perhaps been sometimes confused with it, and that it differs from *A. Lychnidis*, *Kaltenbach*, not only in its generic characters but also in the wholly black colour of the winged viviparous female. This is also a matter for examination. The comparative length of the nectaries appears to be uncertain as a specific character.

5. *M. Oxyacanthæ*, Koch.—Passerini observes that this is not the *Aphis Oxyacanthæ* of Schrank.

6. *M. Tanaceti*, Linn.—Passerini remarks that this is the *Siphonophora Tanaceti* of Koch, and partly the species which I have described as *Aphis Absinthii*, but I believe that all the specimens which I have noticed of the latter species are quite distinct from the *S. Tanaceti* of Koch.

7. *M. Plantagineus*, Passerini.—On *Plantago media*. Not recorded as British.

8. *M. tetrarhoda*. Wlk.—*Siphonophora Rosarum*, Koch.

9. *M. Ribis*, Linn.

10. *M. Asclepiadis*, Passerini.—Not recorded as British.

11. *M. Lythri*, Schrank.

12. *M. Mahaleb*, Fonscolombe.—Passerini conjectures that I have combined this species with *Phorodon Humuli*, from which it differs in the frontal tubercle not being dentate. He observes that the viviparous winged females appear suddenly on *Prunus Mahaleb* in October, and inquires "from whence do they come?"

Of the preceding twelve species *Plantagineus*, *Tetrarhoda*, *Ribis*, *Asclepiadis*, *Lythri* and *Mahaleb* should be separated from *Myzus*, and it is doubtful whether *Oxyacanthæ* and *Tanaceti* belong to it. *Tetrarhoda* and *Ribis* are much more allied to the genus *Phorodon*.

Genus 5. HYALOPTERUS, Koch.

- A. Viviparous apterous female more or less powdered with white. Abdomen of the viviparous winged female green, with three deeper green stripes.
- A. Apterous viviparous female thickly powdered. Tail green. . . . 1. *Pruni*.
- AA. Apterous viviparous female slightly powdered. Tail brown. . . . 2. *Arundinis*.
- AA. Apterous viviparous female never powdered. Abdomen of the viviparous winged female luteous-green, most often with dorsal black bands and with marginal black points. 3. *trirhoda*.



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