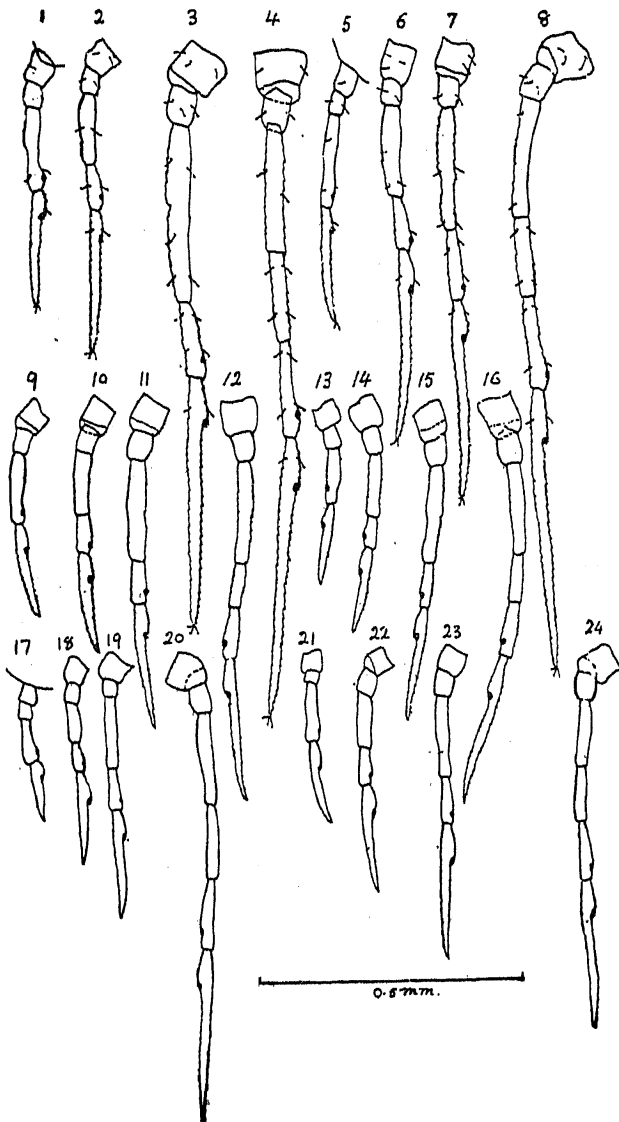


on the alate and apterous viviparous forms of the three species of aphids, viz., *Aphis gossypii* Glover, *Rhopalosiphum pseudobrassicæ* Davis, and *Aphis nerii* Fonscolombe show that the mode of development of the antennæ is more or less similar in all these forms.

In the adult insect each antenna is six-jointed, mobile, filiform and beset with spines. A primary sensorium is situated on the top of the penultimate and another at the base of the ultimate segment, while the secondary sensoria are distributed from the third to sixth segments. The scape is the smallest and the ultimate segment, the longest.



FIGS. 1-8. Antennæ of the nymphal stages of Alate and Apterous viviparous females of *Aphis nerii* Fous. FIGS. 9-16. Antennæ of the nymphal stages of Alate and Apterous viviparous females of *R. pseudobrassicæ* Davis. FIGS. 17-24. Antennæ of the nymphal stages of Alate and Apterous viviparous females of *A. gossypii* G.

Just after hatching, the first stage nymph has four-jointed antenna. The scape and pedicel are nearly of equal length, while the fourth or the ultimate segment is the longest. The primary sensoria are present, one at the distal end of the third segment, the other at the base of the fourth. A constriction then begins to appear in the third antennal segment.

After the first moult the antenna elongates

slightly. The scape and pedicel remain nearly of equal length. The constriction which started in the third segment of the first stage nymph becomes very clear, dividing the segment into proximal and distal portions, the former being longer than the latter. The antenna is now five-jointed, the ultimate segment being the longest. The primary sensoria in this stage are situated on the top of the distal portion of the third segment, which may be called the fourth segment and at the base of the ultimate segment, which now becomes the fifth segment.

The antenna in the third stage nymph elongates further, having five segments, the last being the longest. The primary sensoria are situated on the top of the fourth and at the base of the fifth segment indicating that these are respectively the future fifth and sixth segments of the adult. The third segment also increases in length, and a constriction again appears in it.

In the fourth stage nymph the antenna continues to elongate. The pedicel becomes slightly longer than the scape. The constriction which had started in the third segment of the previous stage divides the segment into two parts, the proximal portion being longer than the distal, making the antenna now six-jointed. The primary sensoria are situated on the same segments as in the last stage, the segment now being the fifth and sixth.

It is concluded that the pedicel does not divide in Aphididæ. In this family the post-pedicel elongates and becomes three-segmented by two successive divisions which take place in the second and fourth nymphal stages. These observations agree with those of previous workers²⁻⁴ except of Saxena.¹

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METABOLISM OF UNSTRIATED MUSCLE

STUDIES of the activity of frog's stomach muscle have shown that there are separate metabolic mechanisms for the production of mechanical activity under different conditions.

1. *Activity under anaerobic conditions.*—The excitability of the muscle to alternating current (10 volts for 10 seconds every 1 minute), after a variable latent period, is at first increased and then depressed, and finally the muscle may be completely paralysed, though partial activity continues for a long time in the absence of oxygen. During this steady state, if oxygen is admitted, there is at first a depression before the response returns to normal; this depression may amount to complete paralysis—oxygen paralysis. These experiments suggest two mechanisms—for aerobic and anaerobic conditions—in unstriated muscle, and