

ART. XXVI.—*New Zealand Diptera: No. 3.—Simulidæ.*

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Plate XIV.

## Family SIMULIDÆ.

THIS is quite a small family of flies, but has an extremely wide geographical distribution, being found in nearly all temperate countries north and south of the equator. The popular name for the insects belonging to this family is "sandflies" or "black-flies," and wherever they occur they are regarded as one of the worst insect-pests, on account of the great local irritation produced by the bite of the female. Three insects are recorded by Walker common in England, while many other species have been described from the European Continent and North America. Mr. Skuse has described two species in his Australian Diptera, but he considers them rather uncommon insects, and says that the majority of the insects known by the name of "sandfly" in Australia belong to the genus *Ceratopogon* of the family *Chironomidæ*. In New Zealand, so far as I am aware, no insects belonging to the *Chironomidæ* molest the peace of man or any other animals. The "sandfly" that is so common throughout the colony is a species belonging to the *Simulidæ*. The family contains but a single genus, but its characters are so peculiar and so constant that there can be no doubt that this genus is rightly excluded from all the larger families. It is undoubtedly more closely related to the *Bibionidæ* than to any of the other families. A New Zealand species was described by Schiner in 1868 under the name of *Simulia australiensis*. Though the description is somewhat meagre, I have no hesitation in assigning all the species that I have collected from three different localities to this species. I have no doubt that future research will reveal the presence of other species, but, as all my specimens show no variation except in size, I think they all belong to this species, which must have a very wide range in the colony.

Mr. Hudson, in his "Handbook of New Zealand Entomology," gives figures illustrating the three stages in the metamorphosis of this insect, and adds some valuable notes on its habits. As in other species, the larvæ are aquatic. They are rather broad maggots, with suckers at both extremities of the body, by means of which they crawl about like a leech or a grameter caterpillar on the plants growing in the

clear running streams that they always inhabit. It appears to be carnivorous in the larval state, living on various small crustaceans and rotifers that abound in these streams. Before pupating the larva fixes itself by glutinous threads to the underside of a leaf. From the anterior part of the body two long-branched filaments project, which are stated by Hudson to have a respiratory function. A cocoon is formed before pupation of membranous or gelatinous material, which is afterwards eaten almost entirely. The pupa hatches into the imago beneath the surface of the water.

Genus *SIMULIUM*, Latreille.

Body small, gibbose, with a tomentum. Head small. Palpi four-jointed; first joint small, second and third longer, fourth long and composed of numerous small annuli, longer in the female than in the male. Antennæ eleven-jointed, narrowed to the tip, a little longer than the head; first and second joints remotely connected, remainder closely connected, transverse, end joint conical. Wings large; first, second, and third dark, remainder of the veins pale. Legs stout, compressed, unarmed; hind metatarsus incrassate in the male, lengthened, in the female hardly incrassate; male's generally black, female's cinereous. Eyes contiguous in the male, remote in the female. Labrum in female lanceolate; labium linear, bidentate at tip. Lingua very long, divided, apical part hairy on the outer surface. Also the antennæ are more remote than in the male.

The above is the fullest diagnosis in any of the works at my disposal. As the genus is such an old-established one I hesitate to add any characters from my own specimens. As in *S. furiosum* (Skuse), from Australia, our species has antennæ with 2 + 8 joints.

*Simulium australiense* (Schiner, "Reise der Novara," Dipt. ii., p. 15).

Blackish-brown, thorax dusted lighter; yellow round the corners of the shoulders; base of femora, tibiæ, and tarsi yellowish. Wings hyaline; costal vein intense black, not nearly reaching the apex of the wing, the other veins brownish; discoidal vein thick as far as the cross-vein, then very faint, the forks with a short petiole; postical and anal veins faint.

In the above description the discoidal vein is the third longitudinal, postical and anal veins are the fourth and fifth longitudinal veins.

This species is abundant on the banks of streams and lakes throughout the colony from sea-level to 3,000ft.

EXPLANATION OF PLATE XIV.

- Fig. 1. *Simulium australiense*. Female.  
 Fig. 2. Larva.  
 Fig. 3. Pupa.