

Two new Spider Egg Predators from the Hawaiian Islands (Diptera: Drosophilidae)

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While rearranging the collection of Drosophilidae in the U. S. National Museum, I discovered a short series of flies from the Hawaiian Islands which apparently belong to an undescribed species of *Titanochaeta*. This genus was erected by Knab (1914, *Insecutor Inscitiae* Menstruus 2:168) for a single species, *ichneumon* Knab, which had been reared from spider egg-sacks on sugar cane from Mountain View, Hawaii.

Through the courtesy of D. Elmo Hardy and E. H. Bryan, Jr., some of the drosophilids which Swezey reported in 1929 (*Proc. Hawn. Ent. Soc.* 7:292) that he had reared from spider egg cases from Oahu, were located and borrowed for study from the Bishop Museum collection. These also prove to be new and are described below.

With the discovery of these two additional species it is reasonably apparent that *Titanochaeta* is an endemic genus in Hawaii, another case of a very ancient natural introduction having broken up into species on different islands. It would be very interesting to make collections from other islands to determine how far this speciation has gone.

Titanochaeta swezeyi Wirth, new species

♂, ♀. Length about 3 mm., wing 2.7 mm.

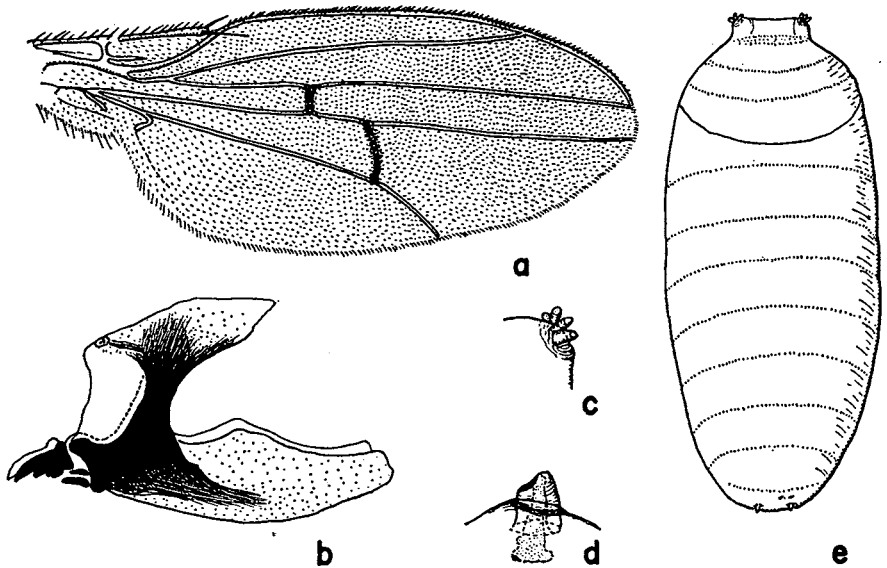
Subshining yellow, bristles and hairs black; face, cheeks, mesonotum, scutellum and pleura whitish pruinose; frons more or less dull brownish-yellow, ocellar triangle and frontal orbits whitish pruinose; abdomen brownish above; wings brownish hyaline, the veins yellowish, both crossveins dark brown.

Frons a third as wide as head, slightly converging toward antennae; ocellar triangle and orbits well differentiated but not raised, with sparse, fine short hairs; middle fronto-orbital bristle three-fourths as long as the anterior, half as long as posterior fronto-orbital, much stronger than in *ichneumon*. Antenna entirely yellow, arista with only two or three rays. Face not as concave as in *ichneumon*, the median carina distinct; cheeks broader, about a fifth of eye height in male, slightly narrower in female; postocular hairs stronger. Eyes with interfacetal hairs rather sparse and short.

Humeri each with a strong bristle and a second shorter one just below; sternopleuron with two strong bristles and a few fine hairs. Mesonotal hairs coarse, suberect and non-seriate; scutellum with anterior marginals divergent, slightly longer than the strong, cruciate, posterior pair; four or five short hairs on each side of scutellum. Legs with strong posterior bristles on fore femora, otherwise as in the genotype.

Female wing with second section of costa 2.8 times as long as third (costal index); ultimate section of fourth vein 3 times as long as the penultimate section (fourth vein index); hind crossvein 0.75 times as long as penultimate section of fourth vein and 0.75 times as long as ultimate section of fifth vein. Male wing (figure 1 a) with costal index 2.7, fourth vein index 4 to 5, and the hind crossvein much more oblique, being 1.1 times as long as penultimate section of fourth vein and 0.6 times as long as ultimate section of fifth vein. End of first section of costa with two long, differentiated bristles.

Holotype ♀, allotype, and 1 ♂ and 1 ♀ paratype, Haiku, Maui, Hawaiian Islands, August, 1918, J. C. Bridwell (ex spider egg mass) (Type no. 61314, U. S. National Museum). One ♀, from Mt. Tantalus, Oahu, O. H. Swezey (ex spider eggs), from the Bishop Museum collection agrees very well with the type series from Maui.



EXPLANATION OF FIGURE

Fig. 1. *Titanochaeta swezeyi*. a, right wing of male; b, cephalopharyngeal skeleton of larva; c, anterior spiracle; d, posterior spiracle; and e, dorsal view of puparium.

Several empty puparia from which this series was reared, were imbedded in the loose, woolly egg-sack of the spider. From these the following descriptions are offered of the puparium and the cephalopharyngeal apparatus of the larva:

Puparium (figure 1 e) 3 mm. long; ovoid, subcylindrical; color amber yellow; surface smooth, with sparse rows of minute, conical spinules on segmental margins. Extreme cephalic end abruptly narrowed and compressed dorsoventrally in a transverse anterior carina about a third as wide as greatest width of puparium. Anterior spiracles borne on anterolateral angles of this carina, each (figure 1 c) consisting of four sessile, tube-like papillae arising fan-wise in a dorsoventral line. Puparium evenly rounded caudad; posterior spiracles (figure 1 d) arising slightly above dorsoventral midline, bases separated by a distance of a fifth of greatest width of puparium, each spiracle in form of a truncated cone, slightly hollowed on inner apex, the spiracular opening apparently in an arc on the inner side before the apex.

Cephalopharyngeal skeleton of the larva as in figure 1 b. Mouth hooks (mandibular sclerites) paired, heavily sclerotized, each with a long distal

tooth, a shorter subapical tooth and two subequal, smaller teeth at base. Two pairs of small, bar-like sclerites lying below bases of mandibles and in front of the blunt, heavily sclerotized, anterior arms of the pharyngeal plates. Posteriorly the skeleton consisting of a pair of vertical pharyngeal plates connected below by a very slender, but heavily sclerotized, transverse band between the anterior arms. (This hypostomal bridge serves to identify these portions of the anterior arms as the hypostomal sclerites which in most drosophilid larvae are separate, slender sclerites, but here have fused with the pharyngeal plates.) Each pharyngeal plate is divided by a deep posterior cleft into broad dorsal and posterior wings or cornua, the posterior margins of which are gradually less heavily sclerotized. Dorsal wings connected above by a hyaline membrane bearing a small, round, brownish sclerotized, sensory area on the midline in front.

Titanochaeta ichneumon Knab differs in its darker, pruinose gray thorax, more pubescent eyes, shorter mid fronto-orbitals, dark third antennal segment, arista with five rays, single humeral and sternopleural bristles, scutellum bare except for the four strong marginals, and wing with only one strong bristle at end of first costal section, the crossveins not infuscated and much more removed from the wing margin. Male wing with costal index 2.5, fourth vein index 2.2 and the hind crossvein a third as long as penultimate section of fourth vein and 0.39 as long as ultimate section of fifth vein.

Through the courtesy of D. Elmo Hardy and C. E. Pemberton, four specimens of *ichneumon* from Pahala, Hawaii, Feb. 11, 1916, were borrowed from the Hawaiian Sugar Planters' Experiment Station and found to agree closely with the type lot. The puparia from which they had issued resemble those of *swezeyi*, except notably for the shape of the posterior spiracles. These are in the form of acute, blackened combs with the apical spiracular openings minute, about two-thirds as far apart as the anterior pair of spiracles, arising at the sides of a turret-shaped, dorsoposterior, median protuberance, about half as high as its diameter with a distinct basal constriction or neck, and with its axis at about eighty degrees with the longitudinal axis of the puparium.

Titanochaeta bryani Wirth, new species

♂, ♀. Very closely related to *swezeyi*, differing in the following particulars: Much smaller, length about 2 mm., wing 2 mm. Color as in *swezeyi*, but crossveins of wing not infuscated. Middle fronto-orbital shorter, half to two-thirds as long as the anterior, and a third to a half as long as the posterior fronto-orbital. Arista with two (in one antenna) or three (in five antennae) rays. Mesonotal setulae in distinct series near midline, non-seriate toward sides. Wing more nearly as in *ichneumon*; female wing with costal index 2.5; fourth vein index 1.6, due to the anterior crossvein being remarkably removed toward base of wing; hind crossvein 0.31 times as long as penultimate section of fourth vein and 0.56 times as long as ultimate section of fifth vein. Male wing very similar to the female, the respective indices being 2.5, 1.8, 3.3 and 0.5.

Holotype ♀, allotype, Manoa, Oahu, Hawaiian Islands, O. H. Swezey, collector (ex spider eggs) (in collection of the Experiment Station, H.S.P.A., Honolulu); 1 ♀ paratype, same data (retained for the U. S. National Museum collection). The attached puparia closely resemble those of *swezeyi*.