

*Dohrniphora venusta* Coquillett (Dipt.) in *Sarracenia flava*.

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(Plate XVII.)

The abundant accumulated insect captures of our larger North American pitcher-plants offer a store of animal food, advantage of which is taken by quite a list of insects. Some of these are apparently habitual and necessary associates of the plants, while others, though they frequently avail themselves of this shelter and food-supply, have other habitual feeding-places. In the late summer the pitchers of *Sarracenia flava* no longer actively capture insects; the accumulated insect remains found in them at this season are more or less dry and fragmentary, and probably no special equipment of habit or structure is required by insects discovering this food-supply to evade capture by the leaf-trap. Among several species present in the pitchers at this time is the larva of a Phorid; from two or three to a dozen or more of these larvae may occupy a single pitcher; the puparia, too, are found among the insect remains, and the emerging flies mate and oviposit in captivity, so that a tumbler of dead grasshoppers is all the equipment necessary to obtain them in all stages. Professor C. T. Brues has kindly identified this fly as *Dohrniphora venusta* Coquillett, a widely distributed species occurring in both North and South America. Coquillett's description (Canadian Entomologist, XXVII, p. 107, 1895), purporting to be that of the female, is in reality that of the male (see Malloch, Proc. U. S. Nat. Mus., XLIII, p. 432, 1912); *divaricata* Aldrich has also been referred to this species. In view of the apparent dearth of knowledge of the life-histories of the Phoridae, the following descriptions of the egg, larva, puparium, and of both sexes of the imago as obtained from *Sarracenia flava* are here presented.

*Egg*.—Elongated oval, not quite symmetrical; white, pearly, slightly polished, minutely but not closely punctate, surface dry, non-adherent; size, .27 x .65 mm.; scattered singly by the ♀; in this stage (at 70 deg. Fahr.) three days.

*Larva*, last stage.—Length 4 mm.; dorsally flattened; brownish-white, unpolished, the texture roughened with fine sparse hairs which are short and microscopic except on the larger pointed processes; on each side the segments bear fleshy pointed processes, progressively larger posteriorly; dorsal area above these processes bears four evenly-spaced rows of lower smaller protuberances; the ventral surface bears six rows, still smaller, those of the outer row on each side papillate, of the inner rows low and inconspicuous; the posterior spiracles are in contact medially, ferruginous, in shape resembling short stout flasks, somewhat flattened; the head segment at its base on each side bears a single protuberance which consists of a stout bristly basal portion surmounted by a smoothly-rounded knob; the antennae (?) are minute, fleshy, apparently 2-jointed, and without setae; the head contains two chitinized parts or organs, the largest of which, a thin flat plate, brown in color, its margin rounded and entire and with two minute perforations near its anterior edge, is of almost equal area to the entire segment; beneath this is the cephalopharyngeal skeleton, which has one great hook with a low tooth on its under surface, and two prominent backward-pointing barbs above; when the skeleton is mounted on a slide, the slight pressure of the cover-glass causes these barbs and a pointed attachment in front of them to separate from the hook, and they are probably segmented to it; on the ventral surface of the succeeding segment is an 8-toothed labial (?) plate; this, with the cephalopharyngeal skeleton, seems to constitute the only chitinized mouth-parts. The larvae are usually so smeared and discolored with their moist and putrid food, which clogs and clings to their roughened surface, that their real structure is hidden; about sixteen days are spent in the larval stages.

*Puparium*.—Not greatly different in size and shape from the larva; in color, dull mahogany brown; the pointed processes of the larva, except the lateral row, almost obsolete; on the third day after the hardening of the larval skin and its change of color, two remarkable flat wand-like structures, their edges fringed with rigid cleft filaments, are pushed upward from the dorsal surface of the fourth segment, their points divergent, and become fixed in this position; the larva seems to possess no such extrusible organs, though two darkened areas on the second segment may indicate their location; these wand-like appendages of the puparium, whatever their office, apparently correspond to the thorn-like processes possessed by the puparia of some other species of the Phoridae. About sixteen days are passed in the pupal stage (at approximately 70 deg. Fahr.), though at summer temperature the transformations probably occupy less time than is indicated by these records from breedings indoors and under unnatural conditions.

*Imago* ♂.—Length 2-3 mm. Head black, almost opaque; front

with the usual fourteen bristles; three strong bristles below the eye on each side; palpi yellow, sparsely black-haired beneath, terminally with three upwardly directed and two downwardly directed bristles; antennae very finely pale pubescent, dark smoky brown above, below slightly paler, more yellowish; arista plumose, black or nearly black; proboscis (in dried examples) reddish-amber, not projecting beyond or below the palpi; oral margin shining brown; no conspicuous ocellar elevations or sutures; eyes finely pubescent.

Dorsum of thorax dark brownish-black, subshining and thickly set with short stiff backwardly directed black hairs; a strong upwardly directed bristle below the anterior spiracle; a supraalar row of four bristles, the first and last the stronger; four prescutellar bristles, the inner (dorsocentral) pair usually the weaker; scutellum naked, opaque, black, with two strong marginal bristles and a barely distinguishable outer pair; halteres pale dull yellowish-brown.

Legs, with their coxae and most of the pleurae, yellow; fore tibiae always with four, often with five, and sometimes with six rather weak setae spaced along the outside; middle tibiae spurred, and with a pair of strong setae below the knee, one comparatively weak subapical seta, and on the apical half a series of oblique rows of short, even, appressed hairs, from which area also spring stronger hairs; hind tibiae spurred but without other setae, though the hairs are longer and stronger along the outer edge; metatarsi of all legs with rows of short even hairs on the inside, this structure best marked on the posterior metatarsi, each of which bears about twelve such rows; pulvilli present but weak.

Wings almost hyaline; veins dark brown, the heavy veins nearly black; base of wing bristly and with three long plumose bristles on lower edge; bristles edging the costa stiff, and as long as the width of the thickened costal vein, which extends slightly beyond the middle of the wing; a single short bristle at the origin of the heavy portion of the third vein, which is distinctly forked; first longitudinal vein reaches the costa about three-fourths the distance from the humeral vein to the end of the thickened costa; mediastinal vein faintly marked; fourth vein up-curved, reaching margin about equally distant from tip of wing as the fifth; seventh vein weak, but readily distinguishable.

Dorsum of abdomen principally velvety black; the basal segment yellow, more or less black-margined posteriorly; the next segment anteriorly yellow, posteriorly black, with an angular backward projection of the yellow area on the median line; the three succeeding segments black, each with a small yellow triangular marking on the anterior edge medially; sixth segment broadly yellow anteriorly, posteriorly black; abdomen beneath, pale; hypopygium in fresh examples usually extruded, sometimes folded back beneath the abdomen; the

clasp-shaped organs are dark brown, the projecting finger-like organ (which in dried examples may be the only portion visible) yellow or pale amber, with fine black hairs: this organ often bears a solidified globule (indicated by dotted line in figure) of about the same color and texture, which might easily be mistaken for a portion of the insect.

♀.—The larger examples (dried) slightly exceed 3 mm. in length; colors of head and thorax, and chaetotaxy, practically identical with those of the ♂; the proboscis, in living or freshly killed material, is almost twice as long as that of the ♂, is horny, and is usually held vertically as shown in the figure; in dry examples it is drawn up obliquely or horizontally between the palpi, but exceeds them in length by fully its own width; in this sex the second joint of the antenna is usually visible and is yellowish-brown; the abdomen of the ♀ is more dilated and less strongly chitinized than that of the ♂, the longitudinal striations (indicated in the figure) are more marked, and the velvety black and yellow of the male are replaced by dull smoky brown; terminal joint of the hypopygium pale amber, usually drying to dark brown.

Described and illustrated from numerous eggs, larvae, and puparia, and from nine male and six female flies, bred from dead insects contained in the pitchers of *Sarracenia flava*, Summerville, South Carolina.

EXPLANATION OF PLATE XVII.

*Dohrniphora venusta* Coquillett, female.

Front of same, showing arrangement of setae.

Egg.

Terminal segments male abdomen.

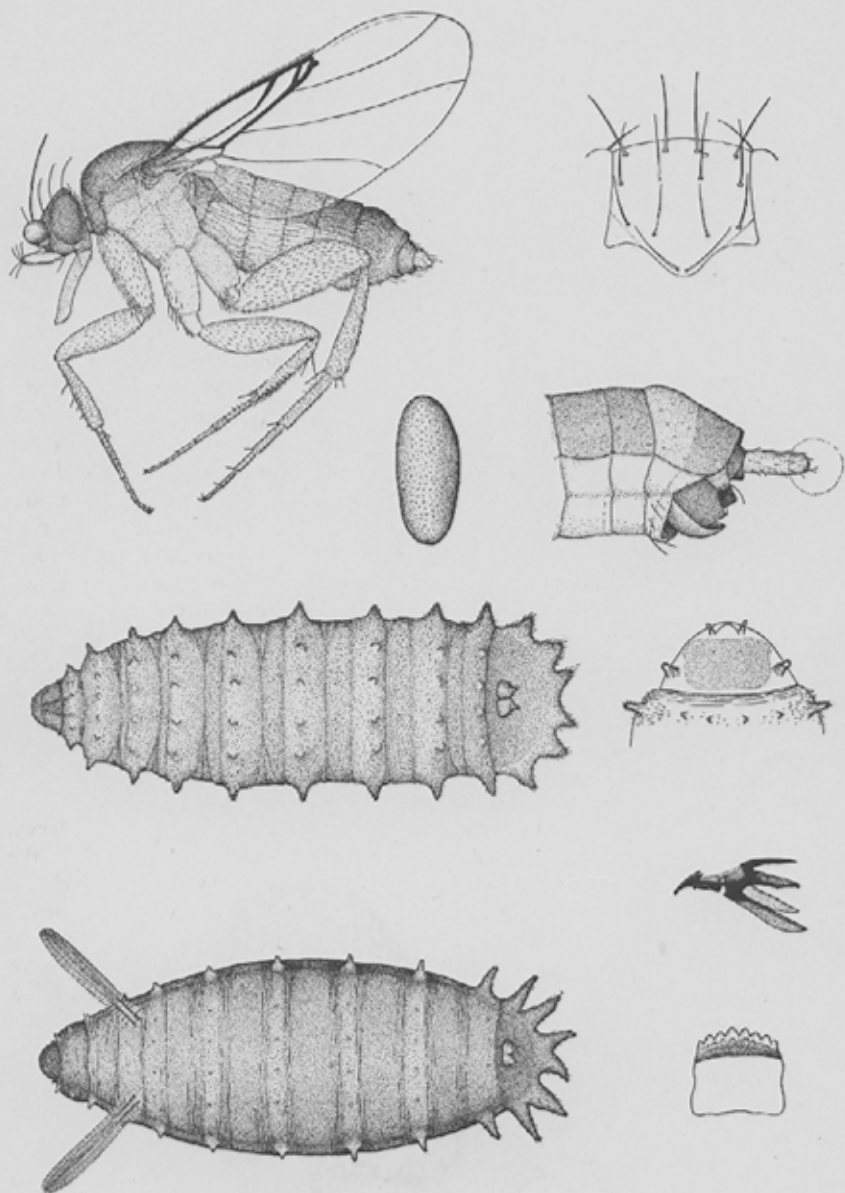
Larva.

Puparium.

Head segment of larva, further enlarged (from slide mount).

Cephalopharyngeal skeleton, same enlargement as preceding.

Labial plate, same enlargement as preceding.



DOHRNIPHORA VENUSTA—JONES.