

ENCARSIA VERSICOLOR SPECIES NOVUM, AN EULOPHID PARASITE OF THE GREENHOUSE WHITEFLY, *ALEYRODES VAPORARIORUM* WESTWOOD.

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Female: — Length, 0.62–0.69 mm.; av. length, 0.6545 mm.; expanse, excluding cilia, 1.309 mm.; width of forewing, 0.145 mm.; length of forewing, 0.545 mm.; length of head (dorsal aspect), 0.109 mm.; thorax, 0.273 mm.; abdomen, 0.273 mm.; length of ovipositor, balsam mounts, 0.145 mm.

General color pale cadmium yellow, marked with variable dusky. Cephalic sides of thorax, mesopleura, metapleura, tips of scape, base of pedicel, and occipital region at apex of the neck with more or less dusky; apical joint of antennæ sometimes dusky. Basal two-thirds of dorsum of abdomen, tegulæ, and cephalic half of axillæ, dusky, in the former case usually deeper on the two proximal segments and especially at the meson, forming two (2) more or less rounded spots; incisions of abdominal segments dorsad paler. A discal inverted triangular area with concave sides, in the mesocutum, slightly duller in color; this becomes wholly black in the male. Eyes blue green, apparently with a conspicuous central dark spot from lateral aspect, but which varies in position with the aspect, always appearing in the plane of the perpendicular; from latero-dorsal aspect, apparently two, one in the center of the eye and one at its dorsal apex. Eyes prominent, rounded, and rather coarse, and with moderately abundant short hairs. Caudal edge of mesoscutum, between the bases of the parapsidal furrows, black or darkened, straight or very slightly convex. Ocelli in a small isosceles triangle on the dorsal aspect of the vertex, somewhat nearer the occipital margin, the lateral ones farther from the margin of the eyes on each side than from each other, and the distance between them is at least twice greater than the distance between either and the apical (cephalic) ocellus; the ocellar triangle margined outwardly by two converging sutures meeting just cephalad of the apical ocellus; medio-cephalic portion of the cephalic ocellus concolorous with body, the caudal border margined with ruby red; the latero-caudal portions of the two caudal ocelli concolorous, the cephalic borders margined with ruby red; the ocelli therefore are ruby red and pale cadmium yellow.

At the caudal margin of the vertex, beginning slightly caudo-mesad of each lateral ocellus, at the occipital margin, and slightly obliqued latero-cephalad toward the apical margin of each eye, is a conspicuous dusky or darkened carina, one on each

side; apparently these do not join; these carinæ are margined caudad by more or less dusky, and they do not quite approach the margin of the eye. Head rugulose, but portions of the lower face near the eyes delicately hexagonally sculptured; occiput rugulose. Thorax more regularly sculptured into delicate hexagonal figures, fainter or absent on the narrow parapsides, but present on mesoscutellum, mesoscutum and axillæ. Scutellum normal, hemispherical, but with a regularly convexed cephalic margin; mesopostscutellum narrow. A few long setæ on thorax.

Abdomen sessile, oval, about equal in length to the thorax, at least portions apparently very delicately polygonally sculptured; segments, unequal.

Antennæ inserted near the mouth border, 8-jointed, with a 2-jointed club; moderately uniformly hairy, except the naked basal third of scape. Scape slender, slightly curved and thicker in the middle, longer than the next three joints combined, its basal third naked, pale and constricted. Pedicel short and thick, truncate apically, and tapering to a point caudad, the thickest joint, appearing somewhat swollen in comparison with the next joint, though normal, slightly longer than the next joint (funicle 1), and longer than wide; funicle 1 cylindrical, longer than wide, the shortest and most slender joint, though very nearly as wide as funicle 2, and about two-thirds its length; funicle 2 a third longer than 1, slightly wider, longer than the pedicel, and about two-thirds the length of funicle 3; the next four joints subequal, cylindrical, funicle 4 very slightly broader and longer, all about a third longer than funicle 2; basal joint of club slightly shorter than the apical joint, subtruncate apically, subequal to funicles 3 and 4, longer than funicle 2; apical joint cylindrical oval, gradually tapering apically; club joints distinct. Antennæ apparently longitudinally finely rugulose, most evident on the pedicel.

Legs normal, all tarsi 5-jointed, the basal joint of the intermediate tarsi not especially long, shorter than the following four joints combined, the middle tibial spur not half as long as the basal tarsal joint of the intermediate legs, and rather slender. Legs hairy, trochanters and coxæ pallid; at least the cephalic and caudal coxæ longitudinally striate, and the legs apparently so, like the antennæ.

Forewings narrower than usual, the venation dusky pale yellow, appearing dark when wings are closed, and in some balsam mounts. Marginal vein twice thicker than the submarginal, about equal to it in length, or slightly longer, and bearing 8 marginal bristles from papillæ arising from its edge; 7 of these papillæ are usually distinct, but all of the bristles are sometimes hard to make out; these bristles longer than those costal fringes immediately succeeding, at apical end of the marginal vein; there are also two shorter bristles from the submarginal vein, and one from the surface of the tegula; submarginal vein crenulate interiorly. From the surface

of the marginal vein also arises another row of about 7 bristles. Stigmal vein indefinite, sometimes apparently entirely absent, but in reality short or sessile, near the costal margin, paler, and with a hook-like termination. Basal half of forewing slightly dusky, especially that portion of its surface bounded by the marginal vein; a more or less round, conspicuous, naked area just below and beyond the stigmal vein, reaching the costal edge, but not invading the caudal half of the wing; also a more or less distinct bare path around the margin of the apical half of the wing, from the naked area in the stigmal region around to a point on the caudal margin of the wing just opposite to it, appearing as if the second row of cilia was absent. Bristles or fringes of forewing long, especially on the caudo-apical aspect. Forewing moderately ciliated; opalescent.

Marginal vein of hind wing longer than submarginal, and bearing from 7 to 8 bristles along its edge, and 2 shorter ones at its junction with the submarginal; the interior of the wing bears two main rows of cilia, one near the costal edge, and the other following the caudal margin but farther from it. A portion of a third, and perhaps a fourth, present between the two in the basal half of the wing. Costal fringes short.

From ventral aspect, the cheeks have two furrows, converging towards the oral opening, and originating from opposite ventro-lateral margins of the eye. Ventum uniformly concolorous, the coxæ and trochanters paler; labrum dark. Ovipositor not exerted, included within the slightly projecting valves; in balsam mounts, however, generally free for its entire length, but not reaching beyond the tip of the abdomen. Mandibles minute, apical half fuscous, blunt, and with three sinuations or obtuse and delicate teeth at apex.

[Described from 77 specimens.]

Male: — Length, 0.50–0.58 mm.; av. length, 0.546 mm.; expanse, excluding cilia, 1.090 mm.; width of forewing, 0.145 mm.; length of forewing, 0.491 mm.; length of head (dorsal aspect), 0.091 mm.; thorax, 0.199 mm.; abdomen, 0.219 mm.; length of genitalia, exerted, 0.109 mm.

Differs markedly from the female in color, the dusky areas of the body present in the latter, piceous black or nearly so in the former, with the exception of the general color of the wings.

The triangular area on mesoscutum, barely duller or slightly dusky in the female, black in the male, the triangular area of the ocelli black, most of the abdomen, excepting extreme apex, black, including the ventum, the antennæ dusky, the coxæ and femora marked with dusky; most of the metapleura black; cheeks and axillæ black; marginal and submarginal veins darker; thoracic venter more or less dusky.

Eyes dark reddish. Scutellum, lateral margins of mesoscutum, and vertex conspicuously pale cadmium yellow. Otherwise as in female, with the exception of antennal and abdominal characters. Abdomen more cylindrical.

Antennæ more uniform. Scape and pedicel as in the female, but shorter. Scape not exceeding the combined length of the three following joints; pedicel still longer than wide, but distinctly shorter than funicle 1, not more than two-thirds its length; funicle uniform, the joints all subequal in length and width; funicle 1, however, shorter than the others; funicle joints cylindrical, subtruncate at ends, and well separated; in balsam mounts apparently hairless, and with two distinct spines arising, one from each side of the apical ends of the flagellar joints (also present in female, but smaller); club 2-jointed, the basal joint stout, subequal to funicle 4, and one-third longer than the apical joint, which is pointed conical and narrower. Flagellum with at least several distinct longitudinal carinæ, the pedicel with faint longitudinal striations.

Genitalia not exerted, excepting in balsam mounts; they are long and slender.

[Described from 14 specimens.]

To the naked eye, the females are yellow or dusky yellow, and the males appear to be black. The males are very beautiful.

Seen through a hand lens (Coddington, $\frac{1}{2}$ inch), the female is pale cadmium yellow, with a few dusky spots on sides of the thorax, the antennæ dusky yellow, the eyes blue green, ocelli apparently red, wings opalescent, their basal halves dusky, and the basal half of the abdomen conspicuously blackish. The male is very dark, the yellow scutellum, dark venation and eyes, black axillæ, ocellar area, and mesoscutellar area, being characteristic.

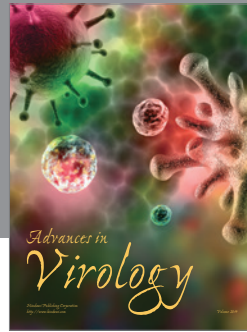
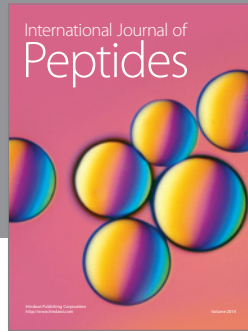
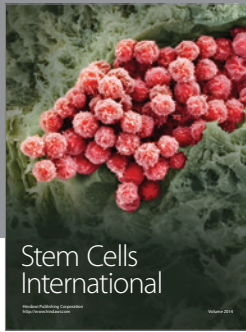
When mounted in balsam, some of the structures and colors are obscured, and in many cases it is difficult to make them out correctly. I believe, therefore, that, if possible, these minute parasitic Hymenoptera should be described from unprepared specimens, and as soon after death as possible. The eyes of the females become dark reddish several days after death. In balsam mounts the base of the marginal vein in this species is transparent, the eyes apparently spotted with black and sometimes dark throughout, venational and antennal characters variable and often obscured, the abdominal segments pressed out of their normal positions, and the genitalia out of theirs.

Described from 77 females and 14 males, first reared by Mr. John J. Davis, March 4, 1908, from *Aleyrodes vaporariorum* Westwood in the fourth postembryonic instar, on *Salvia*, pansy-geranium and other flowers in the greenhouse of the University of Illinois, Urbana, Illinois. Subsequently reared in large numbers from the same hosts March 7 to 31st, 1908.

Nearest to *Encarsia townsendi* Howard, and *coquilletti* Howard, but easily distinguished from the two species by antennal and tarsal characters, color of the eyes and body, the carinæ on the vertex, and the naked spot on the wings; distinct from all other species by specific structural characters, agreeing, however with *quaintancei* Howard and *pergandiella* Howard in having a naked area on the wings. The most striking characters of this species are the cephalic carinæ, the naked spot on the wings, the slightly dusky basal half of the wings, the peculiar coloration of the eyes and ocelli, and the contrasting colors of the male.

Types: — 9 females, 5 males, in collection Illinois State Laboratory of Natural History (Accession, No. 37474); *cotypes*: 4 females, 1 male, in collection Milwaukee Public Museum, (No. $\frac{1023}{26105}$); and *cotype* No. 11704, United States National Museum Washington, D. C., 3 males, 3 females. All balsam mounts.

Hosts parasitized by this species become blue-black at least by the time of the pupation of the parasite. The latter emerges from a small round hole in the cephalic portion of the thorax dorsad, and is solitary, the parasitic pupa filling nearly the entire cavity of its host. The parasite was exceedingly abundant during March, 1908, in one greenhouse and the percentage of parasitism was at least as high as forty percent; its habits appear to be similar to those of the Aphelininae in general.



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