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Perumyia embiaphaga, a New Genus and Species of Neotropical Tachinidae (Diptera) Parasitic on Embioptera

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INTRODUCTION

The family Tachinidae in its larval stages is almost exclusively endoparasitic on the class Insecta, and its numerous members parasitize primarily the orders Lepidoptera, Coleoptera, Hemiptera, Orthoptera, Hymenoptera, Dermaptera, and Diptera. At the present time only one genus of the Tachinidae, *Rossimyioptosis* Mesnil (1953) from South Africa, has been reported as parasitic on the web-spinners of the order Embioptera. It is therefore of special interest to find a hitherto unknown genus from the Western Hemisphere that is parasitic on two genera of Neotropical Embioptera.

The new genus, *Perumyia*, described below, can be readily separated from other described tachinid genera by the following combination of structural characters: closed and long petiolated apical cell, reclinate divaricate ocellar bristles, and strong row of reclinate fronto-orbital bristles. Tentatively it is referred to the tribe Actiini of Townsend's classification (1934-1942). I am unable to indicate a close relationship to any described tachinid genus. This new genus is not closely related to the genus *Rossimyioptosis*.

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The specimens that form the type series were reared from field-collected cultures of Embioptera. Only one puparium is available, and it is enveloped in embiopteran silk and not enclosed in an embiopteran body, which indicates that the larval parasite leaves the body of its host prior to pupation, in contrast to *Rossimyopsis whiteheadi* Mesnil, which pupates within the embiopteran host body.

ACKNOWLEDGMENTS

The preparation of this paper was undertaken while I was holding an appointment for one year as Research Fellow at the American Museum of Natural History. I wish to acknowledge my thanks to the authorities of the American Museum and to Dr. Jerome G. Rozen, Jr., and Dr. Willis J. Gertsch of the Department of Entomology for facilities and advice. I also thank Dr. Edward S. Ross for suggesting that I study these embiopteran parasites, Mr. Gaetano di Palma who made the line drawings, and Miss Marjorie Statham who prepared the photographic prints.

SYSTEMATICS

GENUS **PERUMYIA**, NEW GENUS

TYPE SPECIES: *Perumyia embiaphaga*, new species.

GENERIC CHARACTERIZATION: Head of male about one-fourth wider than high, of female only one-fifth wider than high; frontal profile sloped, arched, and slightly longer than facial, latter receding; clypeus distinctly depressed and less than twice as long as wide, with faint carina; epistoma protuberant on middle; facialia less than one-half of clypeal width on middle; vibrissal axis one-fourth less than antennal axis; palpi developed, gently clavate; antennal axis four-sevenths of head height and set below middle of eye; male third antennal segment somewhat enlarged, female third antennal segment narrower; arista thickened nearly to tip, finely micropubescent; eyes bare (fine, short, sparse hairs visible under high magnification); male and female vertexes about four-tenths of head width; inner vertical bristles stout; outer vertical bristles present, smaller than inner verticals; female with two pairs of proclinate fronto-orbital bristles and row of six pairs of reclinate fronto-orbital bristles extending below bases of aristae, male without former; frontalia slightly less than parafrontal width; ocellar bristles developed, reclinate divaricate; para-facialia bare below; para-facialia in male narrowed below to less than one-half of width of parafrontal; cheeks about one-fourth of eye height; facialia bristled, almost attaining arisal bases.

Thorax presenting prosternum with few small lateral bristles; prescutum one-third shorter than postscutum, scutellum slightly shorter than prescutum; propleura and postnotal slopes bare; three preacrostichals, third pair near suture, hind pairs longest, but bristles shorter than hind presutural dorsocentrals; three postacrostichals, hind pair longest, but bristles shorter than hind postsutural dorsocentrals; two presutural dorsocentrals, hind bristles longest; three postsutural dorsocentrals, hind bristles longest; two preintraalar bristles, second pair near suture; three postintraalar bristles; intra-postsutural bristles undeveloped; one intra-

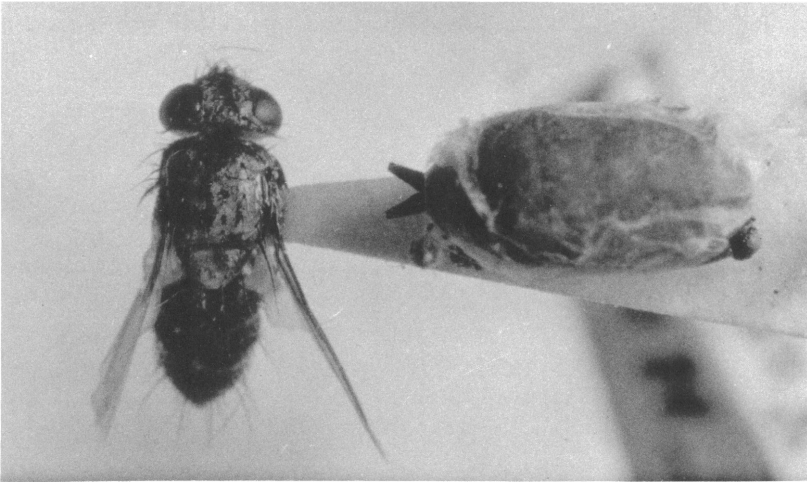


FIG. 1. *Perumyia embiaphaga*, new species. Male paratype, dorsal view; puparium, dorsal view, enveloped in embiopteran silk.

postalar bristle; three postalar bristles; two humeral bristles; one pre-supraalar bristle; three postsupraalar bristles; three sternopleural bristles, but third may be very fine and one or more small bristles may be present or absent; four lateral scutellar bristles, the first and third pairs minute, the second and fourth pairs elongate; small apical scutellar bristles present; one pair of discal scutellar bristles.

Legs of moderate length, tarsi shorter than tibia; mid femur with two or more anterior bristles midway; mid tibia with two strong anterodorsal bristles; claws and pulvilli short.

Wings clear, prestigma nearly two and one-half times length of stigma, latter more than one-half of radiocosta; costal spine small; apical cell closed and long petiolate; R_5 with four bristles above; R_6 on middle $3M$, M_3 nearly straight and before middle; squamae nearly as wide as long.

Abdomen long ovate, about width of thorax; segment I+II depressed mesially to posterior border; segments I+II and III with pair of median and lateral marginal bristles; segments IV and V with rows of strong marginals; no median discal bristles.

Male postabdomen with inner forceps developed, broad; outer forceps greatly reduced; inner forceps in posterior view separated by suture basally and divided apical halves approximate; aedeagus moderately stout; fifth sternite moderately large, longer than broad, with U-shaped emargination over one-half of length of sternite.

Female postabdomen not studied.

Puparium with stigmatal plates located on prominent protuberances which are narrowly divided basally.

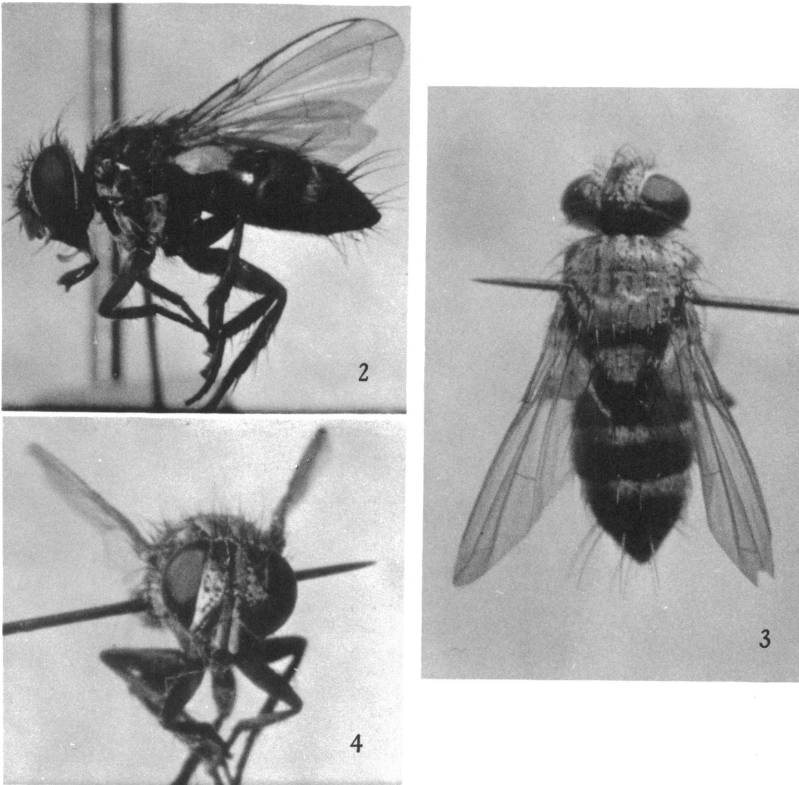
***Perumyia embiaphaga*, new species**

Figures 1-14

DIAGNOSIS: Imago (figs. 1-10) small (4.2 mm. to 4.7 mm. in body length), black and silvery gray pollinose, head in both sexes with strong row of reclinate fronto-orbital bristles and reclinate divaricate ocellar bristles, wing with apical cell closed and long petiolate; puparium (figs. 11-14) with stigmatal plates on prominent protuberances.

MALE (HOLOTYPE): Length, 4.5 mm.

Head (figs. 5, 6) with front at vertex 0.386 of head width; blackish above, brownish below, silvery pollinose; frontalia yellowish brown, slightly narrower than one parafrontal; parafrontal silvery pollinose, with a few sparse black hairs only; outer verticals slightly more than one-half of length of inner verticals; occipital fringe black, intermediate bristles short; occiput white-haired; six to seven frontals, two pairs of frontals at or below antennal bases; six pairs of reclinate fronto-orbital bristles extending below arista bases; parafacial narrowed below, bare, silvery; eyes reddish brown, with extremely fine, short, sparse hairs; vibrissae strong, barely decussate, on oral margin; facialia with seven pairs of recurved black bristles, attaining lowest reclinate fronto-orbital bristles, but below arista bases; antenna with segments 1 and 2 and base of third yellowish, remaining portion of third segment yellowish brown, first segment short, second segment elongate, third segment broad, not attaining vibrissal base in length, less than three times length of second segment; arista with first, second, and basal portion of third segment yellow, apical two-thirds brownish; arista with first segment narrow and annulate, second segment more than twice as long as high, third segment finely micropubescent to tip, at base slightly narrower than second segment and enlarged on basal



FIGS. 2-4. *Perumyia embiaphaga*, new species, female paratype. 2. Left lateral view. 3. Dorsal view. 4. Head, front view.

three-fifths and then rapidly narrowing to a fine tip; cheek one-fourth of eye height, lightly silvery, with strong black bristles and hairs on lower margin; proboscis short, haustellum brownish black, black-haired, labella reddish brown, brown-haired; palpus yellow, longer than cheek height, slightly curved and widened apically, with a few fine, black hairs apically.

Thorax with mesonotum and pleura black in ground color, entirely black-bristled and black-haired, the latter very sparse on pleural areas; mesonotum and pleura silvery gray pollinose; vittate, with pair of black vittae between preacrostichals and presutural dorsocentrals, continuing behind suture without interruption, stopping before mid postscutum; postscutum with middle vitta starting immediately behind suture and broadening midway and connected to inner lateral vittae at their termination, narrowing again when terminating at posterior border of postscutum;

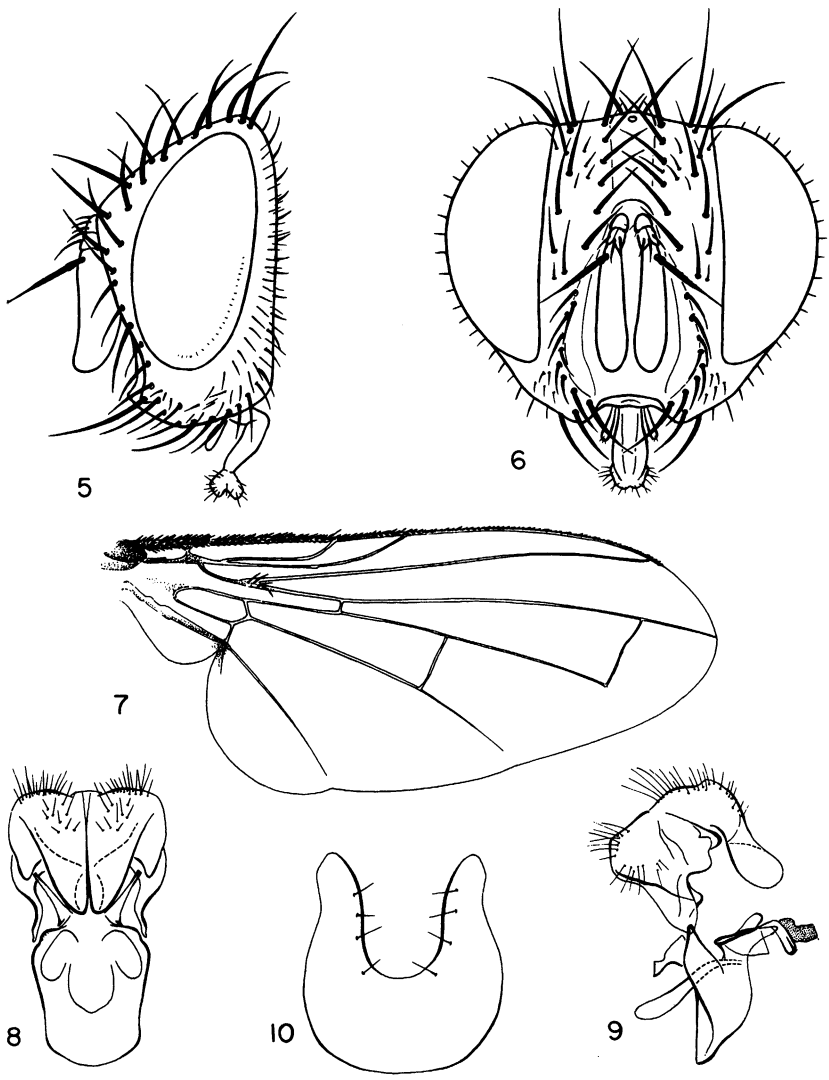
second pair of broader lateral vittae on outer side of presutural dorsocentrals attaining and continuing behind suture and terminating prior to posterior postsutural dorsocentrals; mesonotum behind suture, when viewed obliquely from behind, with narrow transverse band connecting vittae before mid postscutum; scutellum black, entirely gray pollinose, basal third without hairs; prosternum with one pair each of small black bristles and hairs at sides; bare bare.

Legs black, black-bristled and black-haired, brownish tinged near knee joints; femora very thinly silvery pollinose, mid femur with two bristles on anterior surface, with two strong anterodorsal bristles with their bases at units 10 and 16 on tibial measurement of 32, the second bristle stoutest, two small posterior bristles with their bases at units 14 and 21, the second bristle larger and one ventral bristle at unit 18; apical tarsal segments short, claws and pulvilli short, claws blackish, pulvilli white.

Wings (fig. 7) 3.3 mm. in length, 1.3 mm. in width; clear, lightly yellow, brownish black on alular fold; microtrichia light brownish to clear; veins yellow to light brown; apical cell long petiolate; R_1 with one sensory seta at tip; R_5 at base with four bristles above, two below; costal spine small; costal marginal setulae extending only onto basal one-twentieth of radiocosta (one setula); divisions of costa: costigium 22, prestigma 43, stigma 18, poststigma 68, radiocosta 32, and petiole 23; costa at base of prestigma on lower surface with several posterior projecting hairs; venation as illustrated; epaulet black; squamae white, lower lobe tinged yellow; halter with stalk reddish brown and knob blackish.

Abdomen black, segment V with brownish tinge posteriorly, entirely black-bristled and black-haired, about width of and about one-sixth longer than thorax; segments I + II, III, IV, and V above medially about 9:18:20:16 units in length; segment I + II depressed mesially to posterior border; first sternite narrow, with few fine hairs posteriorly, second to fourth sternites concealed; basal silvery pollinose bands above on segments III and IV occupying basal halves or less of segments; segment V almost entirely pollinose, more thickly so on basal half; segments I + II and III with moderately stout median and lateral marginal bristles; segments IV and V with strong rows of marginals, on segment V somewhat removed from posterior border.

Postabdomen (figs. 8, 9) contained within abdomen, brownish black; first segment arch-shaped, about 0.07 mm. long at narrowest in middle and 0.12 at sides, without hairs or bristles; second segment 0.15 mm. in length, haired on basal half; inner forceps about 0.28 mm. long, in posterior view with inconspicuous median division and apical halves in profile broad to apex, about 0.07 mm. in width; outer forceps undevel-



FIGS. 5-10. *Perumyia embiaphaga*, new species, holotype male. 5. Head, lateral view. 6. Head, front view. 7. Right wing. 8. Portion of postabdomen, posterior view. 9. Postabdomen, left lateral view. 10. Fifth sternite.

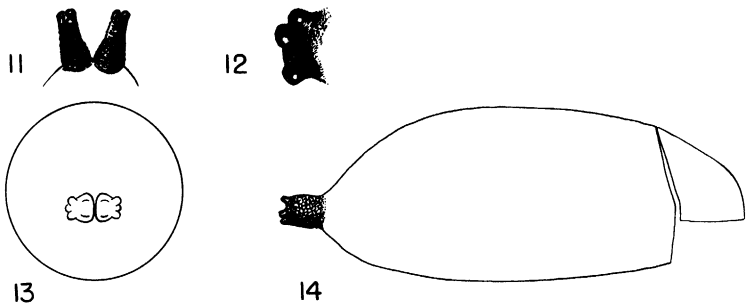
oped, with only slight projection; anal membrane 0.25 mm. long, 0.18 mm. wide; aedeagus angulate, membranous at apex, 0.20 mm. long; distiphallus 0.08 mm. long, 0.065 mm. high, and 0.05 mm. wide; ejacula-

tory apodeme 0.07 mm. in length; posterior gonapophyses projected upward; anterior gonapophyses longer and more slender than posterior gonapophyses, attaining and passing base of distiphallus; fifth sternite (fig. 10) curved, 0.36 mm. wide, 0.39 mm. long, with U-shaped emargination 0.2 mm. in depth and 0.15 mm. in average width, with slender bristles on sides of emargination, basal portion without hairs or bristles.

FEMALE (ALLOTYPE): Length, 4.3 mm.

Similar to holotype in coloration and chaetotaxy, but with sexual dimorphism as here enumerated.

Head (figs. 2, 4) with front at vertex 0.395 of head width; facialia with six pairs of bristles, not attaining arisal bases nor lowest reclinate fronto-orbital bristles; third antennal segment slightly enlarged, not attaining



FIGS. 11-14. *Perumyia embiaphaga*, new species, puparium. 11. Posterior spiracles, dorsal view. 12. Posterior spiracle, end view. 13. End view. 14. Lateral view.

vibrissae in length, less than three times length of second segment; two pairs of proclinate fronto-orbital bristles, the lower pair larger; cheek slightly less than one-fourth of eye height; palpus enlarged on apical half, with few fine, black bristles apically.

Thorax with bristling and pattern as illustrated (fig. 3, paratype).

Wing (fig. 2, paratype) 3.6 mm. in length, 1.5 mm. in width; R_5 bristled above, with four strong bristles at base; divisions of costa: costigium 15, prestigma 49, stigma 20, poststigma 80, radiocosta 37, and petiole 29; venation as illustrated.

Abdomen with segments I + II, III, IV, and V above medially about 10:21:23:19 units in length; segment I + II depressed mesially to posterior border.

Postabdomen not studied.

PARATYPES: Length of males varying from 4.2 mm. to 4.7 mm., of females (two) 4.7 mm.; heads with fronts at vertexes in males from 0.375

to 0.396 of head widths, averaging 0.386, in females 0.416 and 0.418, averaging 0.417; facial bristles in males (left:right) 6:7, 8:6, 8:7, in females 6:6 and 7:5; sternopleurals varying from a very weak, fine, third hair to developed small bristle.

PUPARIUM: Small, moderately elongate (figs. 11–14); subshining, red to reddish brown; finely banded longitudinally with undulating spine bands; stigmal plates shining black, divided into three protuberances (fig. 12), details of slits not discernible under available magnification and without special preparation; stigmal plates borne on prominent black protuberances (fig. 11), narrowly divided at bases, progressively divergent, forming V-shaped separation when viewed from above, protuberances granular from bases to stigmal plates, located below median axis (fig. 13); length, 3.8 mm.; diameter, 2.2 mm.

TYPE DATA: Holotype male: Ten kilometers northwest of Pucallpa, Peru, October 3, 1954 (E. I. Schlinger and E. S. Ross), emerged November 7, 1954, *ex* culture *Clothoda*, new species; deposited in the collection of the California Academy of Sciences, San Francisco. The right wing of the holotype is mounted in balsam on a slide; the postabdomen is stored in a microvial in glycerine. Allotype female: Same data as holotype, but emerged October 30, 1954; deposited in the collection of the California Academy of Sciences, San Francisco. Paratypes, three males and two females: One male and one female, same data as holotype but dates of emergence November 10, 1954, and November 7, 1954, respectively; two males and one female from Yurac, 67 miles east of Tingo Maria, Peru (E. I. Schlinger and E. S. Ross), with one male and one female reared from cultures collected September 28, 1954, the male emerged on October 20, 1954, *ex* mixed culture of *Clothoda*, new species and new genus, new species of Embioptera, and the female emerged October 27, 1954, *ex* culture of *Clothoda*, new species, and the second male (with puparium) without date of collection of culture, but emerged October 23, 1954, *ex* culture of *Clothoda*, new species; deposited in the collections of the American Museum of Natural History (one male, one female), the United States National Museum (one male), and the writer (one male, one female).

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