A New Neotropical Shore Fly Genus with Two New Species

(Diptera: Ephydridae)

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Shore flies of the Neotropical and southern Nearctic Regions are poorly known. It is likely that more than half of their fauna is still undescribed; biologically they are even less well studied. The purpose of this paper is to describe a new genus and two new species from this geographic area. We wish to acknowledge Dr. James C. Hitchcock, Jr. of the World Health Organization in Nuku'alofa, Tonga Islands, South Pacific, for the gift of specimens, and Drs. R. O. Schuster and Saul I. Frommer, University of California, Davis (UCD), and University of California, Riverside (UCR), respectively, for lending specimens from their collections.

Diedrops, new genus

Type-species, *Diedrops aenigma* Mathis and Wirth, new species, by present designation.

Description.—Moderately large flies, length 2.78 to 4.53 mm, females usually larger than males; generally dark colored dorsally, contrasting with lighter venter.

Head (Figs. 8, 10): Head wider than high; face protruding, arched with scattered setae; oral margin setulose, setae larger than facial setae, becoming stronger posteriorly; frons over three times wider than long, mesofrons depressed; ocelli on sides of median prominence which is raised above level of mesofrons; two larger pairs of lateroclinate fronto-orbitals but also with three to four smaller bristles anterior and between larger pair; vertical bristles somewhat separated from each other, distance between divergent and convergent vertical bristles equal to distance between divergent vertical and first large fronto-orbital; frons with some additional, very small, and for the most part indistinct, scattered setae, lacking postocellar setae or bristles and well developed postoculars. Antennae widely separated, ratio of distance between eyes to distance between antennal bases approximately 1:0.30 from a cephalic view; segments dark in color, third segment subequal to length of first and second; arista pubescent. Face large, the dominating head feature, arched and somewhat protruding with semiflattened area between antennae and with slight depressions beneath antennae; face much lighter in color and contrasting distinctly with frons, sparsely setulose to setulose. Eyes bare; eye to cheek ratio more than 1:0.75. Gena very wide,

with one prominent bristle but with only a few scattered, small setae, concolorous with face. Maxillary palpi very small, only slightly longer than wide; prementum large, bulbous, setulose; clypeus a fairly narrow band.

Thorax: Mesonotum, scutellum, notopleuron and dorsal portion of mesopleuron distinctly darker than remainder of pleura, unicolorous, dark brown; pleura otherwise mostly gray. Presutural bristles weak; acrostichal setae in two rows, becoming stronger posteriorly; dorsocentral setae stronger posteriorly; one pair of prescutellars lateral of line of dorsocentrals; one pair of bristles between acrostichal and dorsocentral rows and just anterior to level of prescutellars; one pair of small presutural setae just anterior to dorsal angles of notopleuron; one row of inter-alars, becoming stronger posteriorly; one pair of postalars; scutellum setulose dorsally, rounded apically, with two pairs of lateral bristles, posterior pair larger. Notopleuron generally with two pairs of bristles, approximately equidistant from corners; mesopleuron setulose toward posterior margin and with one prominent bristle along posterior margin just above mid-height level; sternopleuron mostly bare except for one small bristle toward posterodorsal corner and two to three very small, scattered setae anterior to larger bristle; remainder of pleuron bare. Legs dark, femora mostly gray, setulose; tibiae and tarsi darker; terminal tarsal segments becoming wider; tarsal claws equal in length to last tarsal segment; pulvilli well developed. Wing (Figs. 9, 11) as long or longer than body length; veins R2 + 3 and R4 + 5 subparallel to each other, closely approximate at end of wing; costa extending to M1 + 2 vein.

Abdomen: Dark above. Male with five visible segments; female with seven visible segments; female postabdomen composed of segments six, seven, and eight plus terminal cerci and possibly the ninth sternum; eighth sternum large, subquadrate and without spines; female ventral receptacle with small operculum which is trapezoidally shaped in profile, large extending process shaped like a "Lazy J" (Figs. 2, 3). Male postabdomen symmetrical; surstyli apparently fused with epandrium (Figs. 1, 15); epandrium with few setae, scattered randomly toward middle, cerci protruding, setulose, located toward dorsal edge of epandrium; aedeagal apodeme (Figs. 6, 13) very large, J-shaped, becoming wider ventrally; basiphallus of aedeagus sclerotized, subelliptical; distiphallus membranous, much smaller than basiphallus; hypandrium more or less U-shaped from a caudal view; both hypandrial arms with median lobe; gonal arch extending across hypandrial arms, arch with pointed median projection; between base of hypandrial arms is an oval, sclerotized process that could be the sixth sternum. See species descriptions and figures for further details concerning the male genitalia.

Entomology.—Diedrops, a combination of *diedros* (Gr., "setting apart") plus *ops* (Gr., "eye") in reference to the eyes which are well separated. To promote uniformity with the recent catalog of North American Diptera we consider this genus-group name to be masculine (see Stone, *et al.*, 1965: 10).

Discussion.—Diedrops apparently belongs in the subfamily Parydrinae, although in many respects it is intermediate between Parydrinae and the subfamily Ephydrinae. The reduced mesonotal and cephalic chaetotaxy, undivided eighth sternum of the female postabdomen, the absence of prominent setae extending from the eighth and/or ninth sterna of the female postabdomen, and the presence of a "gonal arch"

(after Clausen and Cook, 1971) in the male genitalia, are all characters which ally *Diedrops* with the subfamily Parydrinae. Characters which *Diedrops* shares with genera in both Parydrinae and Ephydrinae are as follows: The face is prominent, slightly protruding, and setulose; the fronto-orbitals are lateroclinate; the prementum is large, well sclerotized, and bulbous; the clypeus is well developed, band-like. The setulose oral margin is characteristic of Ephydrinae (for additional details on Parydrinae and Ephydrinae, see Clausen and Cook, 1971, and Dahl, 1959).

Within the subfamily Parydrinae, *Diedrops* is most closely allied with *Psilephydra* Hendel, an Oriental shore fly genus. Externally, this relationship is especially apparent. The overall appearance of both genera is very similar, and the resemblance of their head features is particularly noteworthy. The shallow, depressed, fuscous frons; widely separated eyes; and large, arched, setulose, and niveous face are similarities of both genera. The head of *Diedrops* differs from that of *Psilephydra* in the presence of well developed, lateroclinate fronto-orbitals and a setulose oral margin.

The reduced chaetotaxy of the thorax is usually characteristic of the subgenus Parydrinae and both *Diedrops* and *Psilephydra* have poorly developed setae on the presutural portion of the mesonotum. However, some genera of Ephydrinae also have reduced thoracic chaetotaxy, i.e. *Apulvillus*, *Scatophila*. The acrostichal setae of *Psilephydra* are very small, whereas in *Diedrops* many acrostichal setae are subequal to the dorsocentrals. In addition there are two, sometimes three, notopleural bristles in *Diedrops*, but *Psilephydra* has only one.

Structures of the male and female postabdomens of *Diedrops* are more similar to the subfamily Parydrinae than to Ephydrinae. The absence of the large, prominent setae which extend posteriorly from either eighth or ninth sterna, or both, of the female postabdomen is characteristic of Parydrinae. Ephydrinae typically have these prominent setae. The "gonal arch" of the male genitalia of *Diedrops* also allies this genus with the Parydrinae. The male genitalia of *Diedrops* and *Psilephydra* are quite dissimilar. The enlarged, J-shaped aedeagal apodeme, the large hypandrial arms, and the fused epandrial plate are characteristic of *Diedrops* and distinguish it from *Psilephydra*.

In summary, *Diedrops* is probably most closely allied with the subfamily Parydrinae, but it shares many characters with the Ephydrinae and perhaps is an annectant genus. It may be distinguished from any known genus of Parydrinae by the unique wing venation, chaetotaxy, and diagnostic male and female postabdomens.

KEY TO *DIEDROPS* SPECIES

1. Length 4.13 to 4.53 mm; wing apex rounded, vein R2 + 3 nearly parallel to vein R4 + 5 (Fig. 9); length of basitarsus equal to or shorter than combined length of remaining tarsomeres for each leg (Mexico) ..... *aenigma* n. sp.
- Length 2.78 to 3.52 mm; wing apex bluntly rounded, apex of vein R2 + 3 slightly sinuous (Fig. 11); length of basitarsus larger than combined length of remaining tarsomeres for each leg (Peru) ..... *hitchcocki* n. sp.

Diedrops aenigma, new species
(Figs. 1–10)

Description.—As in generic description but with the following additional details. Length 4.13 to 4.53 mm.

Head: Head width to height ratio 1:0.71; frons width to length ratio 1:0.83; eye width to face length ratio 1:0.43. Face mostly niveous to almost silvery, dorsal and lateral margins dark, concolorous with frons; oral margin from cephalic view becoming slightly emarginate at midpoint; setae along oral margin not more than twice the length of facial setae.

Thorax: Length averaging 1.80 mm; lacking any strong dorsocentrals. Wing length to width ratio 1:0.39; costal vein ratio 1:0.50; M1 + 2 vein ratio 1:1.35. Halter mostly pale yellow but with some dark, dustlike areas on capitellum.

Abdomen: Dark colored above, concolorous with mesonotum; fifth tergum of male almost as long as wide. Male postabdomen and male fifth sternum as in figs. 1, 4–7. Female ventral receptacle as in Figs. 2–3.

Holotype male, allotype, 11 paratypes (3 males, 8 females): MEXICO, MICHOACAN, PUERTO MORILLOS, 24 August 1959, A. S. Menke and L. A. Stange (USNM, UCD). One female paratype: Mexico, Sinaloa, 1.7 mi W Potrerillos, Rt. 40, 22 August 1964, P. A. Rauch (UCR). One female paratype: Mexico, Sinaloa, 4.6 miles east of Chupaderos, Route 40, 22 August 1964, M. E. Irwin (UCR). Holotype deposited in California Academy of Sciences, San Francisco, type number 12426.

Etymology.—aenigma, a nominative singular Latin noun meaning "obscure" or "mystery," referring to the puzzling relationship this species has with other shore fly genera and species. The name stands in apposition to the generic name.

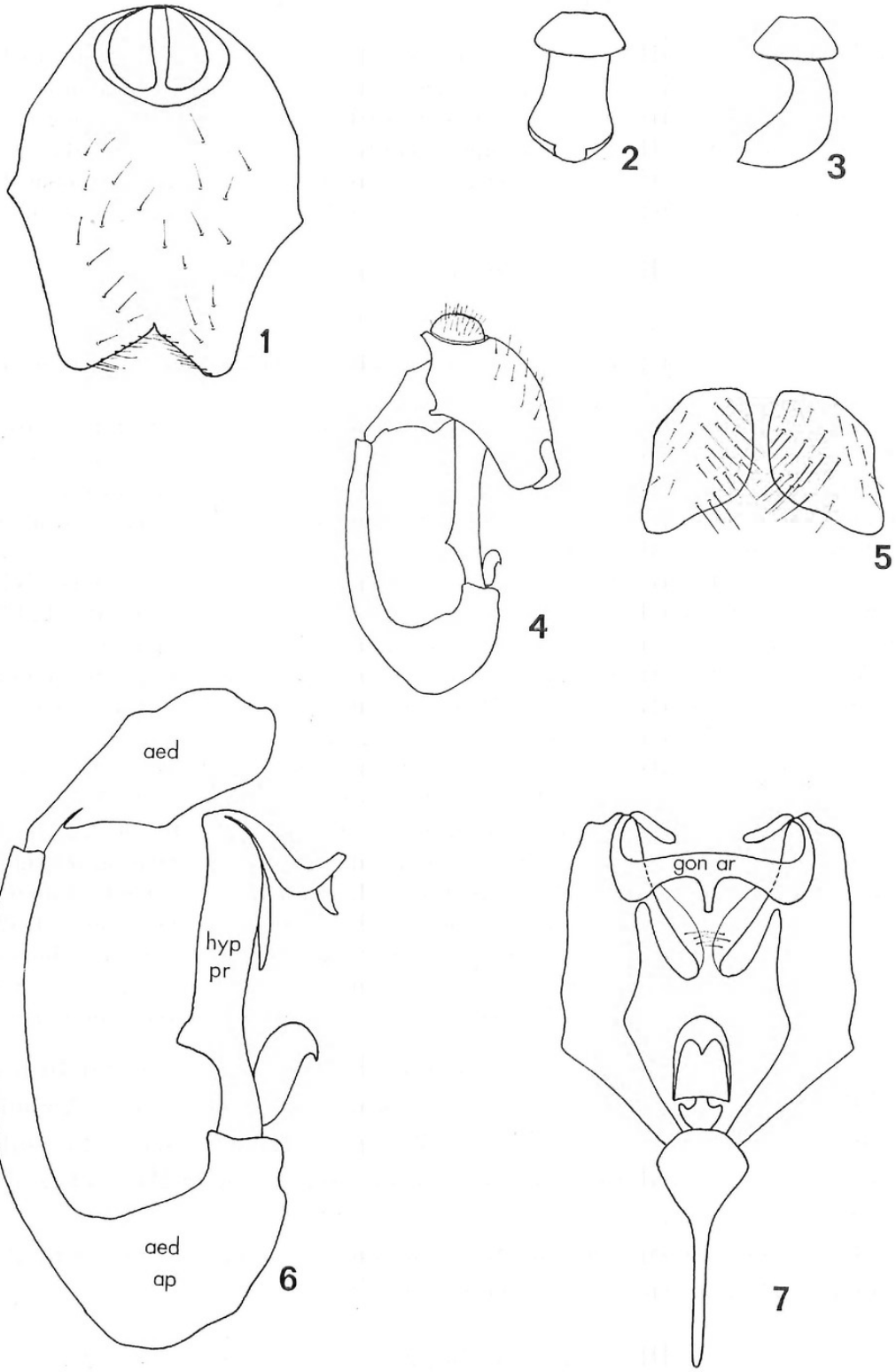
Remarks.—Nothing is known about the biology or natural history of this species. Puerto Morillos is a park workers' settlement in Atzimba National Park, located on Mexico Route 15, approximately 28 miles east of Morelia, and about a mile west of the Summit of Puerto Garnica at 9272 feet.

The large size and diagnostic male postabdomen will serve to distinguish *D. aenigma* from its congener, *D. hitchcocki.*

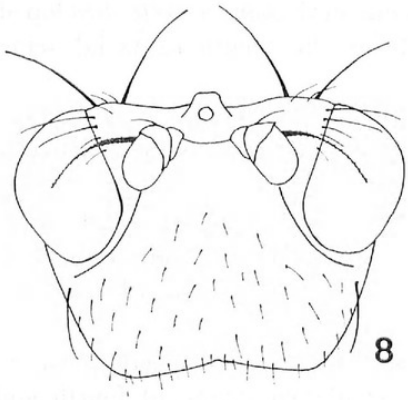
Diedrops hitchcocki, new species
(Figs. 11–15)

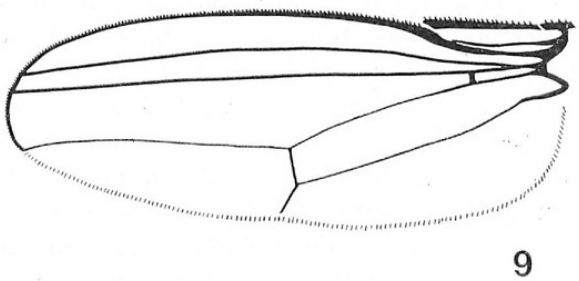
Description.—As in generic description but with the following additional details. Length 2.78 to 3.52 mm.

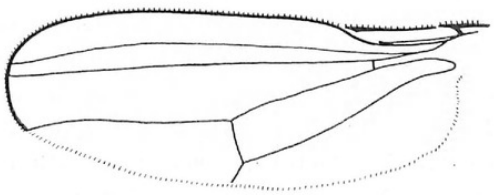
Head: Head width to height ratio 1:0.70; frons width to height ratio 1:0.30;

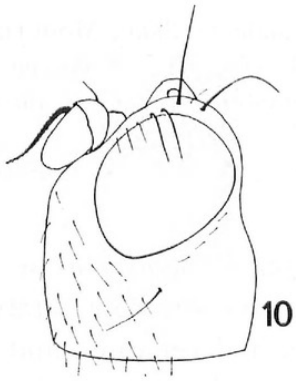


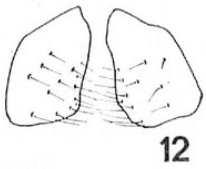
FIGS. 1–7. *Diedrops aenigma*: 1, male epandrium, ventral view; 2, female ventral receptacle, ventral view; 3, same, lateral view; 4, male postabdomen, lateral view; 5, male fifth sternum; 6, male hypandrium, gonal arch, aedeagus, and aedeagal apodeme, lateral view; 7, same, ventral view.

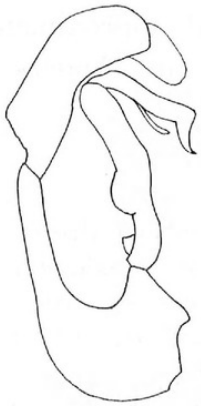


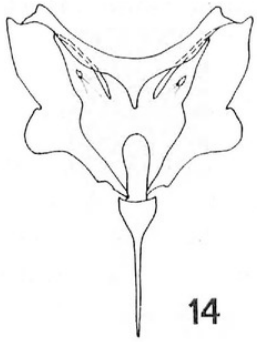


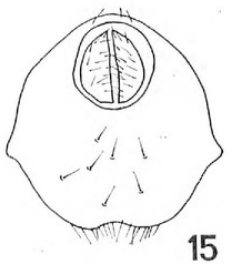












FIGS. 8–15. *Diedrops aenigma*: 8, head, anterior view; 9, wing; 10, head, lateral view. *Diedrops hitchcocki*: 11, wing; 12, male fifth sternum; 13, male hypandrium, gonal arch, aedeagus, and aedeagal apodeme, lateral view; 14, same, ventral view; 15, male epandrium, ventral view. Comparable structures for both species are drawn to the same scale.

eye ratio 1:1.1; eye to cheek ratio 1:0.95; eye width to face length ratio 1:0.67. Face from cephalic view appearing silvery mesad, otherwise niveous, setulose; distinctly protruding from lateral view; setae along oral margin well developed, becoming much stronger posteriorly, well over twice the length of facial setae. Cheek very wide.

Thorax: Length averaging 1.25 mm. Chaetotaxy of mesonotum with distinct bristles; at least one pair of presutural dorsocentrals and two or three pairs of postsuturals, several setae of varying lengths in between larger bristles. Anterior pair of lateral scutellar bristles considerably smaller than posterior pair. Wing length to width ratio 1:0.39; costal vein ratio 1:0.37; M1 + 2 vein ratio 1:1. Halter mostly dark brown but with some pale areas. Basitarsus of each leg longer than combined length of remaining tarsomeres.

Abdomen: Darker above but not concolorous with mesonotum, usually lighter; length of third segment but slightly smaller than combined length of fourth and fifth segments; fifth segment truncate apically, not longer than wide. Male postabdomen and fifth sternum of male as in Figs. 12–15.

Holotype male, allotype, 17 paratypes (10 males, 7 females): PERU, MOQUEGUA, YACANGO, 5–9 October 1965, J. C. Hitchcock, Jr., coll. (USNM). Holotype deposited in National Museum of Natural History, Washington, D.C., type number 71116.

Etymology.—hitchcocki is a Latin genitive patronym in honor of the collector of the type series, James C. Hitchcock, Jr.

Remarks.—D. hitchcocki is distinguished from *D. aenigma* by its smaller size, by the more protruding face, by the stronger setation on the head and thorax, by the shape of the wing and venation, and by the distinctive male postabdomen. The biology of this species is unknown. Yacango is a village in the arid zone of Peru, in Torata District, Mariscal Nieto Province, Department of Moquegua in the valley of the Rio Osmore at 6150 foot elevation on the west slope of the Andes. Collecting was done in the village in what approximated oasis conditions in a desert countryside (Buck, Sasaki, and Anderson, 1968).

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