

A new species of *Peckia* (Diptera: Sarcophagidae) from Costa Rica,
with a note on *P. pexata* (Wulp)

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Abstract: A new species of *Peckia* Robineau-Desvoidy is described from the coastal dry forest of Guanacaste Province, Costa Rica, viz., *Peckia glyphis* sp.n., and a key to the ten species of *Peckia* known from the area is provided. A lectotype is designated for *Peckia pexata* (Wulp, 1895) and intraspecific variation in male leg setosity and in the morphology of male terminalia are documented.

Introduction

The genus *Peckia* Robineau-Desvoidy is a New World taxon of mainly Neotropical distribution containing some 62 named species and several unnamed species awaiting description (Pape 1996 and unpubl.). The generally large size, long adult life, powerful flight, ovo-larviparous reproduction, and fast (yet flexible) larval development make the species very competitive carrion breeders (Denlinger & Shukla 1984; Ferraz 1992, 1993, 1994, 1995) and as such a conspicuous part of the invertebrate decomposer community. No comprehensive taxonomic treatment is available apart from the early papers of Lopes (1955, 1958). Females are notoriously difficult to identify, like most species of Sarcophaginae, and they have remained largely untreated. It is the purpose of the present paper to describe a new species of *Peckia* collected in the coastal dry forest of the Guanacaste Province, Costa Rica, and to provide means for its identification. Also, we take this opportunity to document what appears to be intraspecific variation in male leg setosity and in morphology of the male terminalia of *Peckia pexata* (Wulp), and to designate a lectotype for this nominal taxon.

Material and methods

Costa Rican specimens originated from three field trips to Guanacaste carried out 1995, 1996, and 1999. Further specimens were borrowed from relevant major entomological facilities as apparent from

the list of depositories below. Time constraints have not permitted sorting and dissection of the very extensive holdings of Sarcophagidae at INBio, which may prove to be a rich source of additional material.

Illustrations of male terminalia were made from preparations in alcohol on a layer of glass microbeads for proper orientation, and using a Leitz stereomicroscope with a camera lucida. Morphological terminology follows McAlpine (1981).

Abbreviations for depositories

BMNH	The Museum of Natural History, London
CAS	California Academy of Sciences, San Francisco
CNC	Canadian National Collection of Insects, Ottawa
INBio	Instituto de Biodiversidade, Heredia, Costa Rica
MNRJ	Museu Nacional de Rio de Janeiro
SMNH	Swedish Museum of Natural History, Stockholm
USNM	National Museum of Natural History, Washington, DC

Taxonomy

Peckia glyphis Pape & Andersson, sp. n.
(Figs 1 A,B; 2 A)

Holotype male: COSTA RICA, Guanacaste Province, Santa Rosa National Park, Bahia Naranjo,

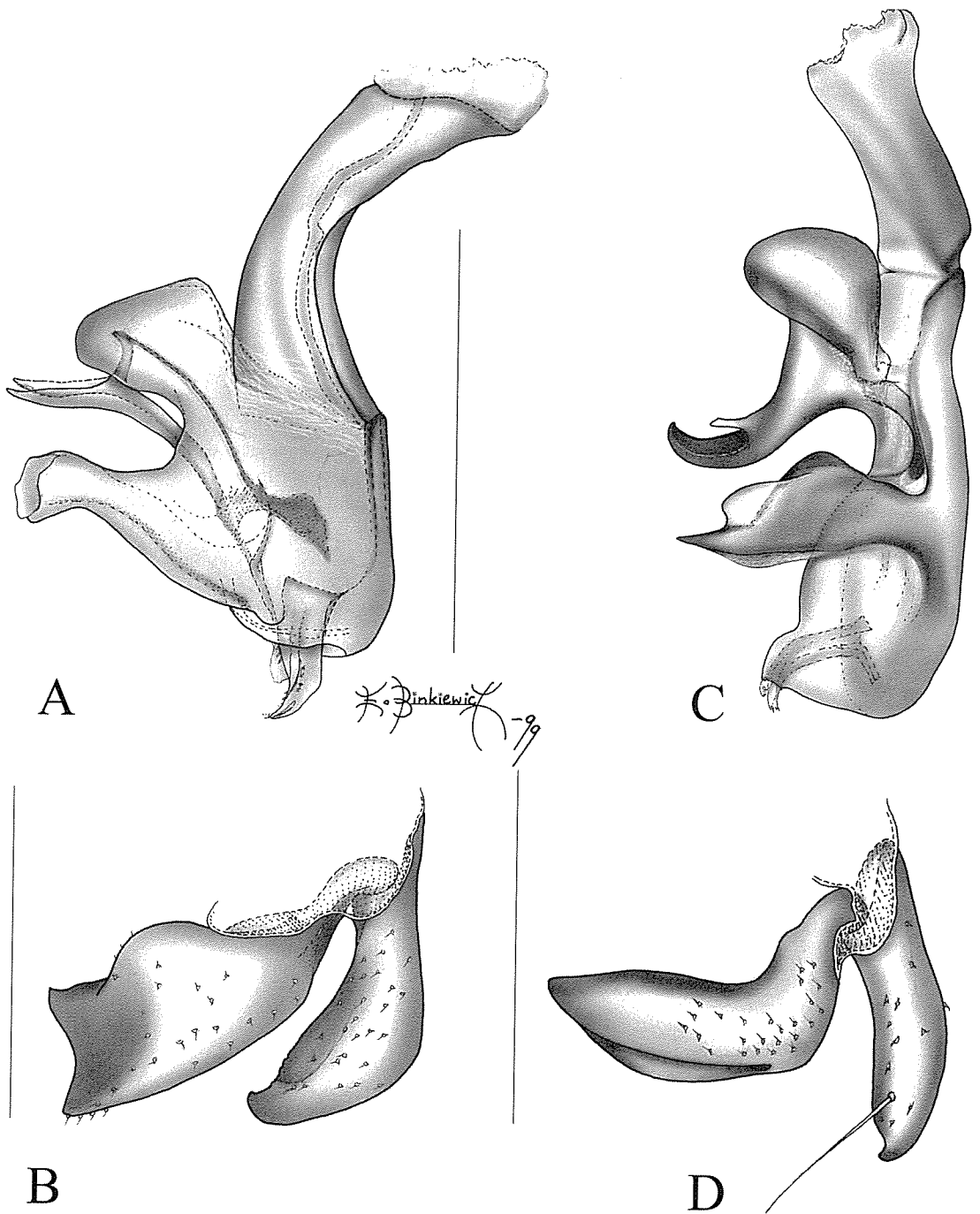


Fig. 1. Phallus (A, C) plus gonopod and paramere (13, D), left lateral view. A, B: *Peckia glyphis*. C, D: *Peckia pexata*. Scale bar = 0.5 mm.

24.viii. 1995, T. Pape (INBio). Paratypes: 5 males, same data as holotype (1 in INBio, 4 in SMNH).

Etymology. From the Greek word “*glyphis*”, meaning knife or penknife. The specific epithet, which should be treated as a noun in apposition, refers to the tip of the male cercus, the shape of which is reminiscent of the blade of a knife (Fig. 2 A).

Description. Male. Head — Postgena with white setae. Gena with two rows of black setae directly below eye and a few black setae in anteriormost part; remaining setae white except for the black genal bristles. Row of parafacial setae black and running close to eye margin. Postocular setae black. One or two rows of black occipital setae posterior to postocular setae; remaining occipital setae white.

Thorax — Lower calypter with a faintly darker, central spot (5 specimens) or entirely whitish (1 specimen); no dorsal setae. Latero-ventral part of scutellum with black setae. Mid and hind leg black with sparse silvery-grey microtomentum; fore femur with more dense silvery shine. Fore tibia with few or no setae having wavy tip, mid and hind tibia with widely spaced rows of long antero- and postero-ventral setae with wavy tip. **Abdomen** — Sternites and ventral part of tergites exclusively with black setae. ST4 square with rounded corners; posterior marginal setae approximately of equal length. ST5 deeply cleft and with a pad of black setae posteriorly on each side close to the midline. Tergites with the usual black and silvery tessellation or checkerboard pattern. Ground colour black, T5 with neither reddish brown spots nor golden tinge, and posterior margin entirely black. **Genitalia** — Protandrial segment reddish with black or sooty areas in anterior part, or almost entirely blackish; epandrium reddish or reddish brown. Protandrial segment without marginal bristles, weakly microtomentose in posterior 0.3-0.4; epandrium with faint microtomentum in posterior 0.3. Cercus with prong distinctly set off from cercal base, especially in posterior view, more or less parallel-sided for most of its length, and in almost straight continuation of the cercal base, yet the prong itself is very slightly undulating in lateral view or with a weak bend. Cercal prongs parallel or converging in posterior view. Surstylus with few, scattered setae at base. Gonopod robust, distinctly bifid apically; phallus as in Fig. 1 A.

Length. Length. 7.0-10.5 mm (mean: 9.3 ± 4.1 mm).

Female. Unknown.

Biology. Unknown.

Distribution. NEOTROPICAL - Costa Rica.

Taxonomic remarks. The shape of the phallus, with a globular or swollen distal part, suggests that the species should be placed in subgenus *Peckia* s.str. (see Pape 1996 for subgeneric diagnoses). Male terminalia of *Peckia glyphis* may resemble those of *Peckia ecuatoriana* (Lopes) and *P. enderleini* (Engel), see figures in Lopes (1958), but *P. glyphis* is distinguishable by its almost straight, dagger-like cercal prong.

Key to species of *Peckia* occurring in the coastal dry forest of Guanacaste Province

1. Anterior abdominal sternites and sometimes also antero-ventral part of tergites wholly or partially with whitish yellow or yellow setae. Lower calypter with or without dorsal setae 2
- All sternites and tergites exclusively with black setae. Lower calypter always without dorsal setae 3
- 2 (1). Lower calypter unicolorous white and with distinct, black dorsal setae; scutellum antero-ventrally with white setae. *P. ingens* (Walker)
- Lower calypter with a vague fumose, central area and either bare or with white dorsal setae; scutellum antero-ventrally with black setae *P. intermutans* (Walker)
- 3 (1). Gena without black setae, all setae yellow or white 4
- Gena at least anteriorly or below eye with black setae, other setae yellow or white 5
- 4 (3). Surstylus (e) deeply incised, with a posterior bare tip and an anterior setose tip *P. uncinata* (Wulp)
- Surstylus (e) not incised, with only a single, bare tip *P. pexata* (Wulp)
- 5 (3). Postgena with white setae, male cercus with almost straight prong *P. glyphis* sp.n.
- Postgena with yellow setae, male cercus with distinctly curved prong 6
- 6 (5). All occipital setae (i.e., setae behind postocular row) yellow *P. gulo* (Fabricius)
- Occiput with at least one row of black setae just below (or posterior to) postocular setae 7
- 7 (6). Male mid femur with apical postero-ventral comb of short, thick bristles 8
- Male mid femur without apical postero-ventral comb 9
- 8 (7). Phallus with a blunt, almost rectangular, ventro-median projection perpendicular to the long axis of phallus *P. volucris* (Wulp)
- Phallus without ventro-median projection *P. anguilla* (Curran & Walley)
- 9 (7). Palp black *P. chrysostoma* (Wiedemann)
- Palp light brown *P. hirsuta* (Hall)

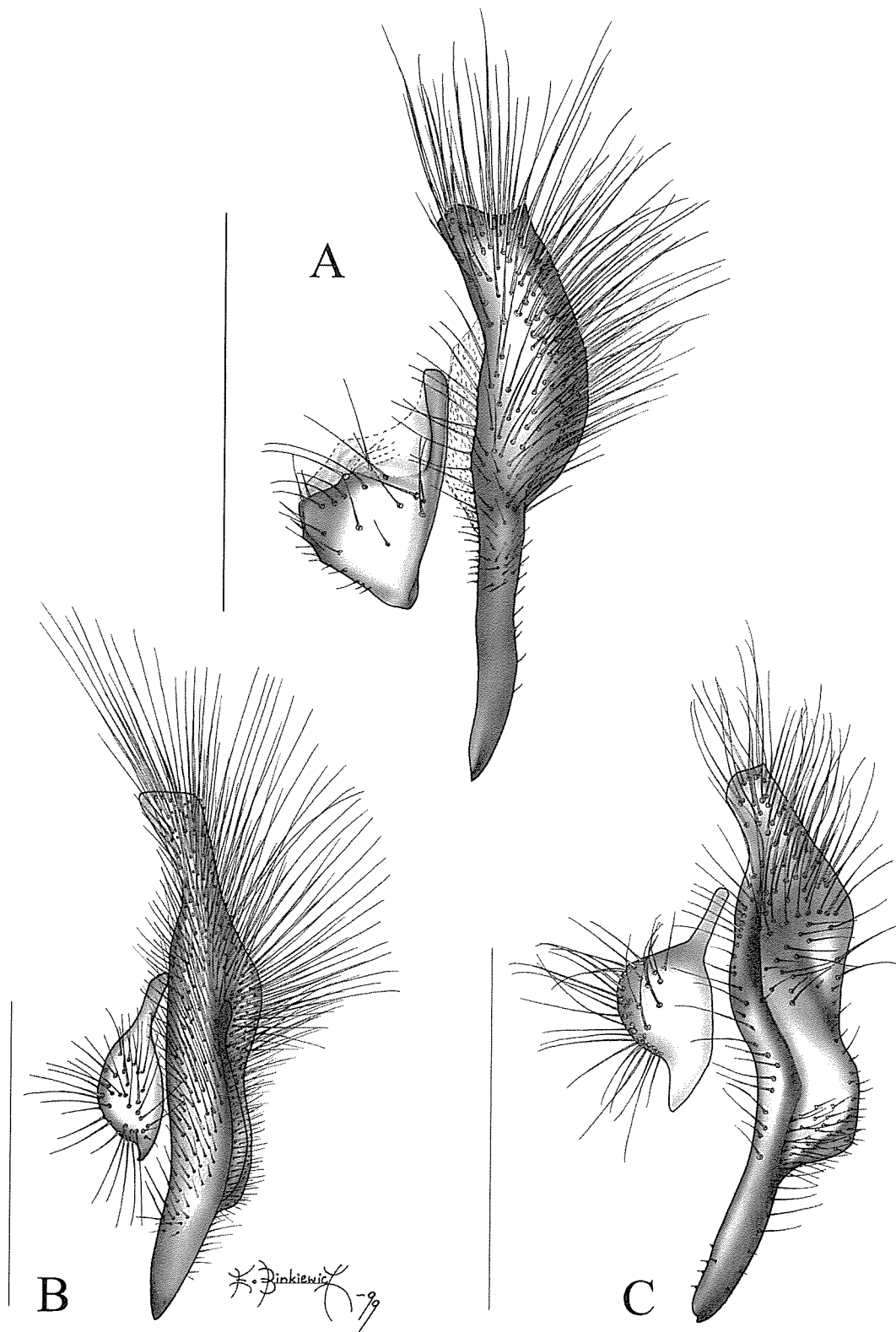


Fig. 2. Cercus and surstylus, left lateral view. A: *Pechia glyphis*. B, C: *Pechia pexata*. Scale bar = 1 mm.

Note on *Peckia pexata* (Wulp)

Peckia pexata (Wulp) (Figs 1 C,D; 2 B,C)
Sarcophaga pexata Wulp, 1895:269. Type locality:
 Mexico, Yucatán.

When preparing the key to species of *Peckia* occurring in the Guanacaste Province, *P. pexata* was noted to possess a striking variation in the male terminalia. Large male specimens have the hind legs, and especially distal part of hind tibiae, equipped with dense fringes of long setae with wavy tips. With gradually reduced body size these elongated setae tend to disappear, and small males have legs with setae almost identical to those of females. Small to moderate-sized male specimens have proportionally small terminalia with a short protandrial segment (first genital segment), the cercus is apically equipped with a minute dent or hook, and the distal part of the cercal prong is very distinctly set off from the remaining cercus by being almost parallel-sided and often even with a slight constriction at base just before the large dorsal hump (Fig. 2 C). Moderate and especially large-sized male specimens have remarkably large terminalia with an elongated protandrial segment, the cercus is more stoutly built, and the cercal prong has a gradually narrowing tip and an apex with little or no trace of a dent or hook (Fig. 2 B). The cercus of larger specimens is more densely setose along the lateral margin, while the smaller specimens may show a single lateral row (Fig. 2 B,C). When the cercus is observed in dorsal (posterior) view, smaller specimens show a deep concavity delimited laterally by a sharp crest. In larger specimens this concavity is smaller and much shallower and the lateral crest is blunt or even broadly rounded. With most specimens falling into either one or the other morphotype, a sibling complex was at first suspected. An examination of a large amount of material revealed specimens showing intermediate cercal and setal configuration, and both morphotypes were fully sympatric as well as contemporaneous (both morphotypes often caught by the same collector on the same day). It should be noted that *P. chrysostoma* (Wiedemann) also is known to show a striking variation in the shape of the male cercus, which at least in part is correlated to body size (see discussion and figures in Lopes 1976). Also, Lopes (1976) indicates that *P. chrysostoma* shows the same correlation between small size, short protandrial segment, and reduced tibial villosity as is documented here for *P. pexata*.

Wulp (1895) described *Sarcophaga pexata* from a total of four male and one female specimens with no designation of a particular holotype or equivalent. Aldrich (1930) reexamined the type series and "restricted" the species to two males, one of which had its terminalia illustrated (Aldrich's fig. 15). For the formal fixation of the identity of *Sarcophaga pexata* Wulp, 1895 in the presence of a mixed type series, designation of a lectotype is considered justified. Following the recommendation of the ICZN (74B), we herewith designate the specimen illustrated by Aldrich (1930: fig. 15) as lectotype, and the specimen has been labelled accordingly as given below. [Aldrich did not explicitly mention which male was illustrated, nor was any male labelled as such, and the specimen was selected from the best match between terminalia and illustrations.] The remaining four exemplars of the type series herewith become paralectotypes and they have been labelled as such.

Material examined. Type material: LECTOTYPE male, herewith designated, labelled "SYNTYPE" [round printed label with blue margin], "Co-type" [round printed label with yellow margin, terminalia glued to margin], "N. Yucatan. Gaumer.", "B.C.A. Dipt. II. Sarcophaga pexata, [male symbol] v.d.W." [printed label with "pexata, [male symbol] v.d.W." handwritten], "Central America. Pres. by F.D. Godman. O. Salvin. 1903-172" [printed label], "LECTOTYPE [male symbol] Sarcophaga pexata Wulp T. Pape det. 2000" [red, handwritten label]. Depository: The Natural History Museum, London. The lectotype shows leg chaetotaxy and terminalia of the 'gracile' morphotype here illustrated as Fig. 2C.

Paralectotypes. 1 male, labelled as lectotype but with last label "Paralectotype [male symbol] Sarcophaga pexata Wulp T. Pape det. 2000" [yellow printed label] (identity: *Peckia pexata*); 1 male labelled: "SYNTYPE" [round printed label with blue margin], "Chilpancingo, Guerrero, 4600 ft. Oct. H. H. Smith.", "B.C.A. Dipt. II. Sarcophaga pexata, [male symbol] v.d.W." [printed label with "pexata, [male symbol] v.d.W." handwritten], "Central America. Pres. by F.D. Godman. O. Salvin. 1903-172" [printed label], "Paralectotype [male symbol] Sarcophaga pexata Wulp T. Pape det. 2000" [yellow printed label] (identity: *Peckia chrysostoma* (Wiedemann)); 1 [female symbol] labelled, "SYNTYPE" [round printed label with blue margin], "Co-type" [round printed label with yellow margin, terminalia glued to margin], "Atoyac, Vera Cruz. April H.H.S.", "B.C.A. Dipt. II. Sarcophaga pexata, [male symbol]

v.d.W." [printed label with "pexata, [male symbol] v.d.W." handwritten], "Central America. Pres. by F.D. Godman. O. Salvin. 1903-172" [printed label], "not pexata" [long narrow label in Aldrich's handwriting], "Paralectotype [male symbol] *Sarcophaga pexata* Wulp T. Pape det. 2000" [yellow printed label] (identity: *P. chrysostoma* (Wiedemann)); 1 female labelled "SYNTYPE" [round printed label with blue margin], "Acapulco, Guerrero. Sept. H.H. Smith.", "B.C.A. Dipt. II. *Sarcophaga pexata*, [female symbol] v.d.W." [printed label with "pexata, [female symbol] v.d.W." handwritten], "Central America. Pres. by F.D. Godman. O. Salvin. 1903-172" [printed label], "Paralectotype [female symbol] *Sarcophaga pexata* Wulp T. Pape det. 2000" [yellow printed label] (identity: *Peckia* sp.) (all paralectotypes in The Natural History Museum, London).

Additional material. BARBADOS: Cane field, 1 male, [exact locality, date and collector not interpreted] (USNM). BRAZIL: Amapá, Serra do Navio, 2 males, xi.1997, P. Magno (MNRJ); Amazonas, Manaus, 1 male, 11.iii.1973, B.V. Peterson (CNC); Bahia, Salvador, Canela, 3 males, x.1948, H.S. Lopes (CNC, MNRJ, SMNH); Bahia, Encruzilhada Divisa, 960 m, 1 male, 1 female, xi.1972, Seabra & Roppa (SMNH); Espirito Santo, Guarapari, 1 male, 16.i.1974, H.S. Lopes (MNRJ); Espirito Santo, Conceição da Barra, 5 males, iv.1972, P.C. Elias (3 in MNRJ, 1 in SMNH, 1 in USNM); Piauí, Valença, 1 male, 27.iii.1975, D.O. Albuquerque (MCRJ); Rio de Janeiro, Rio de Janeiro, Manguinhos, 11.xi.1913 [no collector] (MNRJ); Roraima, Surumu, 1 male, ix.1966, M. Alvarengai (MNRJ). COSTA RICA: Guanacaste Province, Santa Rosa National Park, 5 males, 23.viii.1995, T. Pape (1 in INBio, 4 in SMNH); Guanacaste Province, Palo Verde National Park, Rio Tempisque near Bird Island, 1 male, 22.iv.1999, M. Andersson (INBio); 1 male same data but 20.iv.1999 (SMNH); Guanacaste Province, Palo Verde National Park, Rio Tempisque, stream, 1 male: 31.iii.1999, 1 male: 14.iv.1999, M. Andersson (SMNH); Guanacaste Province, Palo Verde National Park, station, 1 male, 27.iv.1999, M. Andersson (SMNH). ECUADOR: Guayaquil, 1 male, [no date], F Campos R (USNM); Posorja, 1 male, 3 females, 1917, F. Campos (USNM); Isla Puna, Puerto Grande, Campos, 1 male, [no date], Santiago & Navarro (MNRJ). ELSALVADOR: 1 male, 6.vii.1954, M.S.V. (USNM); Quezaltepeque, 500 m, 1 male, 9.viii.1968, D.Q. Cavagnaro & M. E. Irwin (CAS). MEXICO: Jalisco, Puerto Vallarta, 2 males, 31.xii.1970, P.H. & M. Arnaud (CAS); Morelos, Cuernavaca, 1 male, 26.viii.1951, coll. Reinhard (CNC); Sinaloa, Mazat-

lan, 1 male, 6.viii.1964, W.R.M. Mason (CNC); Tamaulipas, Tampico, 9 males, 10-20.v.1931, Roberts (USNM); Yucatan, 3 males, [no date] G.F. Gaumer (1 in CNC, 2 in USNM). USA: Texas, Victoria, 1 male, "5/16" [no year], coll. Reinhard (CNC). VENEZUELA: Aragua, Cumbre de Chorón, 2 males, 28.xii.1954, P. Cova Garcia (MNRJ).

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