



Calliscelio elegans (Perkins), a tramp species, and a review of the status of the genus *Caenoteleia* Kieffer (Hymenoptera: Platygasteridae)

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Abstract

The monobasic genus *Caenoteleia* Kieffer (Hymenoptera: Platygasteridae) is considered to be a junior synonym of the widespread and common genus *Calliscelio* Ashmead, **new synonymy**. *Calliscelio elegans* (Perkins) is redescribed, transferred to *Calliscelio*, **new combination**, and its geographic distribution documented. Originally described from Hawai‘i, this species is widespread through the tropics. The species likely is distributed by human commerce, possibly in association with cricket pests (Orthoptera: Gryllidae) of sugar cane.

Key words: Hymenoptera: Platygasteridae

Introduction

In 1910 R.C.L. Perkins described a colorful new species of the family Scelionidae from the Hawaiian island of O‘ahu, *Caloteleia elegans*. He recorded the type locality as “Honolulu” and commented that it was certainly introduced. To his eye, this species was distinguished by the shape of its wings: “The wings are very narrow (petiolate) on less than the basal half....” Twenty-five years later, Kieffer (1926) created the new genus *Caenoteleia* for this species, but he provided no explicit indication of why he chose this course of action. His short generic description cites only three character states: hairy eyes, stalked wings (with a complement of veins normal for a scelionid), and the presence of a horn on the first metasomatic segment of the female. Masner (1976) suggested that *Caenoteleia* may be synonymous with *Calliscelio* Ashmead, but without having seen the type, he took no formal nomenclatural action. Currently, the status of the genus *Caenoteleia* has not changed in the 83 years since the publication of Kieffer’s monograph: it contains the single species, *Caenoteleia elegans* (Perkins), and continues to be treated as a valid genus.

In the years since 1976, we have been able to examine the type material during three visits to the Bernice P. Bishop Museum in Honolulu. The objective of this paper is to clarify the taxonomic status of both the genus *Caenoteleia* and its sole species *C. elegans*. Additionally, records are presented of the remarkable distribution of this species that have been gleaned over the past 30 years from collections around the world.

Materials and methods

This work is based upon specimens from the following collections with abbreviations used in the text: ANIC,

Australian National Insect Collection, Canberra, ACT, Australia¹; BPBM, Bernice P. Bishop Museum, Honolulu,² HI; CASC, California Academy of Sciences, San Francisco³, CA; CNCI, Canadian National Collection of Insects, Ottawa, ON, Canada⁴; MHNG, Muséum d'Histoire Naturelle, Geneva, Switzerland⁵; OSUC, C.A. Triplehorn Insect Collection, Columbus, OH⁶; UCDC, University of California, Davis, CA⁷; UCFC, University of Central Florida, Orlando, FL⁸; UCRC, University of California, Riverside, CA⁹; USNM, National Museum of Natural History, Washington, DC¹⁰.

Abbreviations and morphological terms used in text: A1, A2, ... A12: antennomere 1, 2, ... 12; claval formula: distribution of large, multiporous basiconic sensilla on the underside of apical antennomeres of the female, with the segment interval specified followed by the number of sensilla per segment (Bin, 1981); OOL: ocular ocellar line, shortest distance from inner orbit and outer margin of lateral ocellus (Masner and Huggert, 1989); S1, S2, ... S5: metasomal sternite 1, 2, ... 5; T1, T2, ... T6: metasomal tergite 1, 2, ... 6. Morphological terminology otherwise follows Masner (1980) and Mikó et al. (2007).

Under the Material Examined section, the numbers prefixed with "OSUC ", "CASENT ", "UCFC ", "MHNG " are unique identifiers for the individual specimens. The label data for all specimens have been georeferenced and recorded in the Hymenoptera On-Line database; details on the data associated with these specimens can be accessed at the following link, purl.oclc.org/NET/hymenoptera/hol, by entering the identifier in the form. Note the space between the acronym and the number. Data for the species as a whole can be accessed at <http://purl.oclc.org/NET/hymenoptera/hol?id=4132>.

Images and measurements were made using Automontage and Cartograph extended-focus software, using a JVC KY-F75U digital camera, Leica Z16 APOA microscope and 1X objective lens. Images are archived at Specimage, the image database at The Ohio State University¹¹, and Morphbank.¹² The identifiers beginning "urn:lsid..." are life sciences identifiers and may be resolved at the specified URLs or at <http://lsid.tdwg.org>.

This work is conducted as part of the Platygastridae Planetary Biodiversity Inventory. The contributions of the authors are as follows: L. Masner: generic concept development, species concept development, collection development, character definition; N.F. Johnson, L. Musetti: generic concept development, species concept development, character definition.

Results

Caenoteleia Kieffer

Caenoteleia Kieffer, 1926: 266, 550. Original description. Type: *Caloteleia elegans* Perkins, by monotypy. Keyed. Muesebeck & Walkley (1956): citation of type species; Johnson (1992): catalog of world species.

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11. <http://specimage.osu.edu>
12. <http://www.morphbank.net>

There is no indication that Kieffer ever saw any specimens of *Caloteleia elegans*, and the original description of the species included no illustrations. The decision to erect a new genus seems to have been influenced by the comment of Perkins that the species was remarkable for the petiolate wings. In fact, the wings (Fig. 4), while narrow, are not stalked in the same sense that one finds in families such as the Myrmaridae. The wings of *C. elegans* are not extraordinary in any sense in comparison to those of most other platygastroids. This species is nothing more than a distinctively colored and sculptured species of the cosmopolitan genus *Calliscelio*, exactly as suggested by Masner (1976). Thus, after having examined the Perkins material, we feel confident in proposing that *Caenoteleia* is a junior synonym of *Calliscelio*, **new synonymy**.

***Calliscelio elegans* (Perkins), n.comb.**

Figs. 1–5; Morphbank¹³

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Caloteleia elegans Perkins, 1910: 624. Original description.

Caenoteleia elegans: Kieffer, 1926: 550. Generic transfer, description.

Description. Female. General: Length: 2.0–2.4 mm (n=20); body strikingly multicolored (Figs. 1, 4): head, mesosoma, segment 1 of metasoma, legs, A1, A3–A6 deep orange yellow; anterior one-third of T2 and basal two-thirds of T6 yellow; posterior two-thirds of segment 2, segments 3–5 ebony black; apical third of segment 6 darkened; margins of ocelli darkened; A2 slightly darkened, A7 lighter in color than following clavomeres; A8–A12 nearly black; apex of mandible darkened; apex of hind femur slightly darkened; wing strikingly banded, with dark bands basally, medially and apically, separated by light bands, wing membrane beyond basal third infuscate in dark bands, hyaline in white bands, setae in dark bands black, in light bands white.

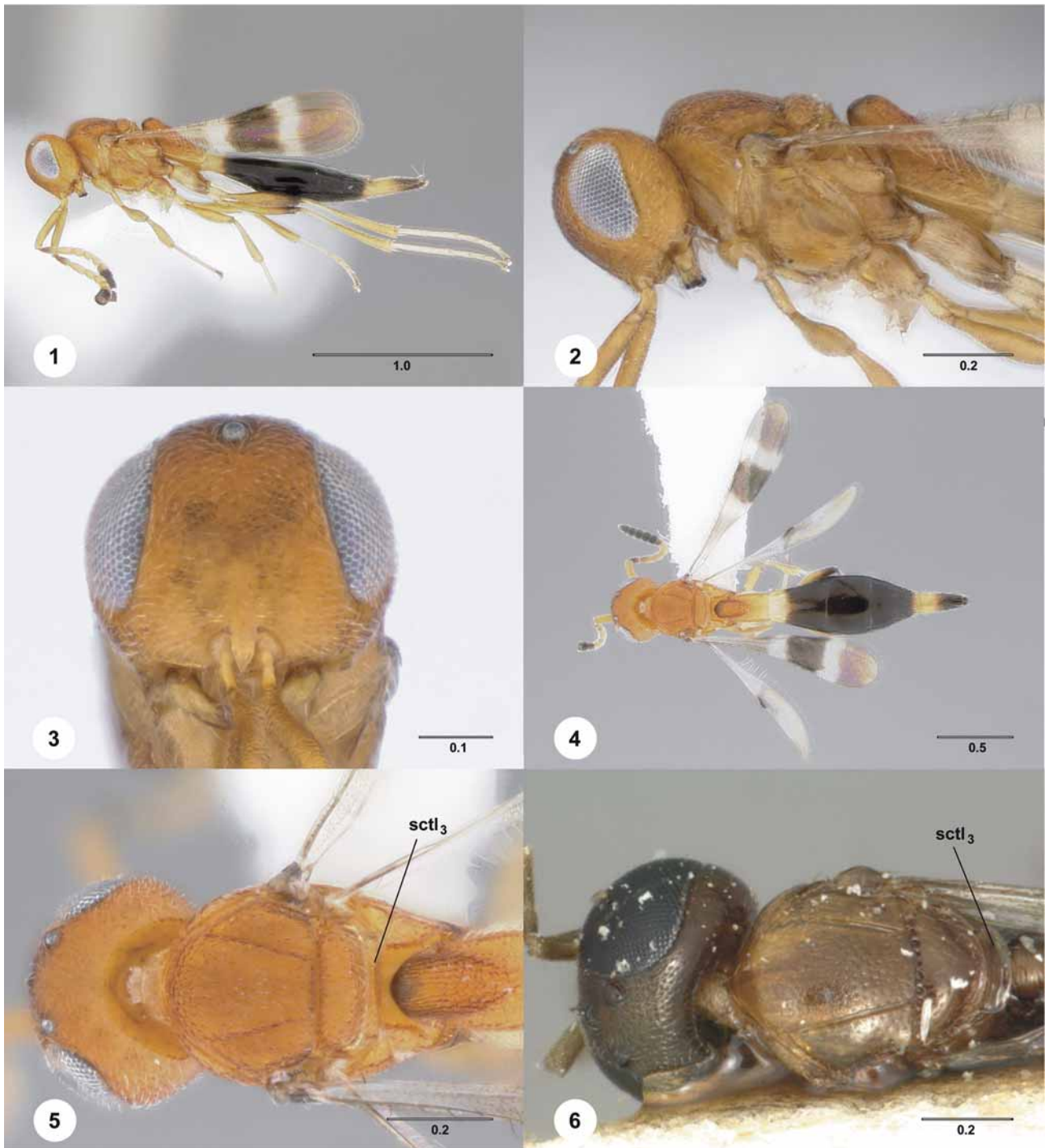
Head: head subglobose, moderately transverse; entire head uniformly with dense granular surface sculpture, lacking smooth area immediately dorsad of toruli, with dense semi-appressed golden hair; occipital carina complete medially, finely crenulate; OOL slightly < 1 ocellar diameter, close to but not contiguous with inner orbit of eye; eye densely hairy, length of hairs slightly shorter than diameter of ocellus; clypeus short, anterolateral corners rounded; anteclypeus with several long erect bristles; malar sulcus largely obscured by surface sculpture; radicle distinctly elongate, one-fourth length of A1; A2 distinctly shorter than A3, subequal in length to A4; A5, A6 almost globular; clava 5-merous, claval formula A8–A12/1–2–2–2–1; clava cylindrical, clavomeres only slightly wider than long; mandible sub-tridentate, middle tooth smallest, lower tooth longer than upper.

Mesosoma: mesoscutum covered by dense granular surface sculpture, dense semi-appressed golden hair; notaulus percurrent, course considerably obscured by surface sculpture; mesoscutellum broadly transverse, width approximately 3 times length; mesoscutellum with same sculpture, pilosity as mesoscutum; metascutellar plate broad, short, weakly concave medially; dorsal propodeum deeply excavate medially, with median keels widely separated, running almost parallel (to accommodate horn on T1); side of pronotum predominantly rugose, with smooth glabrous field in epomial area; netrion finely sculptured; mesopleural depression rather narrow, deep, smooth; mesopleural carina absent; mesepisternum below mesopleural depression finely granular; mesepimeral chain of foveae not developed; metapleuron with fine longitudinal sculpture; meso-, metapleuron almost glabrous.

Wings: fore wing attenuate basally (Fig. 4), extending to middle of T5; R between tegula and costal margin with 12 semi-erect dark bristles distinctly extending beyond costal margin of fore wing; marginal vein (R1 proximal to r-rs) at least 2 times as long as wide, slightly shorter than stigmal vein; postmarginal vein (R1

13. <http://www.morphbank.net/?id=476306>

distal to r-rs) depigmented, slightly longer than stigmal vein; longest marginal cilia in fore wing shorter than stigmal vein; hind wing very dark basally.



FIGURES 1–5. *Calliscelio elegans* (Perkins), female. 1, Lateral habitus (OSUC 215759); 2, Head and mesosoma, lateral view (OSUC 215759); 3, Head, anterior view (OSUC 215759); 4, Dorsal habitus (OSUC 256897); 5, Head and mesosoma, dorsal view (OSUC 256897). Fig. 6, Head and mesosoma, *Calliscelio laticinctus* Ashmead, holotype female, dorsal view. Scale bars in millimeters.

Metasoma distinctly elongate, widest medially, distinctly narrowed both anteriorly and posteriorly; T1 produced into massive horn, with fine longitudinal sculpture over entire surface, base of T1 irregularly rugulose; T2 finely longitudinally striate, striae covering nearly entire surface; T3 broadly transverse, shorter than T2, delicately longitudinally aciculate, sculpture effaced medially; T2, T3 almost glabrous; T4-T5

transverse, with delicate coriaceous microsculpture, with abundant appressed golden pilosity; T6 distinctly elongate, tapering apically, apex truncate; S2 sculpture similar to T2; S3-S5 nearly smooth, with abundant appressed silvery pilosity.

Male: unknown.

Diagnosis. Within *Calliscelio*, *C. elegans* is easily identifiable on the basis of its unique color pattern with the orange-yellow head, mesosoma, T1, and base of T2; T2 (beyond its immediate base) and T3–T5 black; the banded wings with three darkened and two white bands. Additionally, the granulose sculpture of the head and mesonotum is distinctive. In contrast to most *Calliscelio* species, the metascutellar plate is extremely narrow and weakly concave medially to accommodate the metasomal horn (Figs. 4, 5). In most other species of *Calliscelio*, the plate typically extends over the apex of the horn (Fig. 6).

Distribution: Widespread, but rare throughout the tropics (Fig. 7), but also with additional specimens collected in northern Mexico and Florida, and also at fairly high elevation (2000 m) in Nepal. Link to distribution map: <http://osuc.biosci.ohio-state.edu/HymOnline/map-large.html?id=245756>.

Material examined. 60 females: **AUSTRALIA: Christmas Island:** 4 females, OSUC 256857–256860 (ANIC); **Northern Territory:** OSUC 256856 (CNCI). **BELIZE:** 4 females, OSUC 256871–256874 (CNCI). **BENIN:** 3 females, OSUC 256882–256884 (CNCI). **FIJI:** 2 females, FBA015304, OSUC 256864 (BPBM). **FRENCH POLYNESIA:** 8 females, OSUC 256861–256863 (CNCI); OSUC 256866–256867 (UCDC); UCRC ENT 111562, UCRC ENT 135651–135652 (UCRC). **GUAM:** 1 female, OSUC 256854 (CNCI). **INDIA:** 3 females, OSUC 256899–256901 (CNCI). **INDONESIA:** 4 females, OSUC 256893–256896 (CNCI). **IVORY COAST:** 2 females, OSUC 256885–256886 (CNCI). **MADAGASCAR:** 2 females, OSUC 215759, CASENT 2029779 (CASC). **MAURITIUS:** 1 female, MNNG 0002 (MHNG). **MEXICO:** 5 females, OSUC 256868–256870 (CNCI); OSUC 248095 (OSUC); OSUC 256875 (USNM). **NEPAL:** 4 females, OSUC 256890–256892, 256898 (CNCI). **NIGERIA:** 1 female, OSUC 256881 (CNCI). **PUERTO RICO:** 2 females, OSUC 256876–256877 (CNCI). **SAMOA:** 1 female, OSUC 256865 (CNCI). **SRI LANKA:** 2 females, OSUC 256902–256903 (CNCI). **THAILAND:** 2 females, OSUC 256897, 256907 (OSUC). **UNITED STATES: Florida:** 1 female, UCFC 0 079 680 (UCFC); 1 female, OSUC 256875 (USNM); **Hawai‘i:** 1 female, OSUC 256855 (CNCI). **VENEZUELA:** 2 females, OSUC 256879–256880 (CNCI). **YEMEN:** 3 females, OSUC 256887–256889 (CNCI).

Biology. One specimen is recorded as being collected in roots of sugar cane in Hawai‘i. Other less specific habitats vary from possibly natural formations such as tropical dry forest (Madagascar), xeric oak hammock (Florida), edge of swamp (Belize), and forest edge in Dumoga-Bone National Park (Indonesia); to anthropogenic environments such as an agricultural field (Mexico), agricultural experiment station (Puerto Rico), a garden (Moorea), and “urban habitat” (Tahiti Nui).

Comments. We have now been able to accumulate over 60 specimens of *C. elegans*, the result of an intensive hunt among hundreds of thousands of specimens over the last 40 years. Its geographic distribution extends far beyond Hawai‘i: it is found scattered throughout the tropics and subtropics of the world, between 31°N–18°S, from sea level to over 2000 m in elevation in Nepal. For such a widespread species, it appears to be remarkably rare. The initial collecting record by Albert Koebele, for which he noted that the O‘ahu specimens were collected in the roots of sugar cane, suggests to us that *C. elegans* is a parasitoid of a host associated with this crop. Its wide distribution, therefore, may be the result of widespread sugar cane cultivation around the world. Even though *Calliscelio* is a diverse, common, and widespread genus, the only published host record for any species (Hill, 1983) is for *C. teleogrylli* Hill. This species attacks the eggs of *Teleogryllus commodus* (Walker) (Orthoptera: Gryllidae), a pest in pastures that is widespread in the Pacific region. Similarly, we suspect that *Calliscelio elegans* attacks the eggs of one or more species of Gryllidae associated with sugar cane.

No males are among the specimens examined for this study. This may be because the male sex is chromatically different and not so conspicuous. But, in our experience, strong differences in color between sexes are not found in *Calliscelio*. Among the light-colored species, males are sometimes somewhat darker overall and the dark bands on the fore wings, if present in the female, may be weaker or even absent in the

male. But, in general, the two sexes are similar in color. Another explanation for the lack of any male specimens may be that this species is thelytokous. This mode of reproduction is unusual among platygastriids, but certainly not unknown (Austin et al., 2005), and would be advantageous for a species to establish itself in new parts of the world.

We note here that a number of platygastriids seem to have extraordinarily broad geographic distributions. Examples include *Iphitrachelus lar* Haliday, *Calliscelio marlattii* (Ashmead), *Aradophagus fasciatus* Ashmead, *Opisthacantha mellipes* Ashmead and *Duta virginiensis* (Ashmead). For none of these has the host been identified. *Psix tunetanus* (Mineo & Szabó) is found in the Mediterranean region of Africa east to Saudi Arabia, and also in both North and South America (Johnson & Masner, 1985). This species is a parasitoid of the eggs of pentatomoids (Hemiptera). *Trissolcus basalis* (Wollaston) has been intentionally introduced around the world to control the pantropical pest *Nezara viridula* (Linnaeus) (Hemiptera: Pentatomidae). This parasitoid species was originally described from the island of Madeira (Wollaston, 1856), but was also found early on (and described as *Telenomus megagephalus* Ashmead) in the West Indies in 1894. All of its closest relatives are native to Africa. These observations reinforce our conviction that a global perspective is optimal for taxonomic and systematic studies. Additionally, the number of widespread species of these small to minute parasitoids may be expanding as a result of increased globalization of commerce.

If *Calliscelio elegans* is, through most of its range, an introduced species, then from which part of the world did it originate? *Calliscelio teleogrylli* Hill is similar in the sculpture of its frons, itself a relatively unusual character for the genus. While this species has been recorded only from New Zealand, its host is widespread, and our sampling of platygastriids in the Pacific region is inadequate to confidently assert that *C. teleogrylli* is restricted to New Zealand. Another species with the same granular sculpture, as yet undescribed, has been collected in Yemen. Progress toward resolution of this question will require increased sampling around the world and a better understanding of the diversity and interrelationships of species in the genus *Calliscelio*.

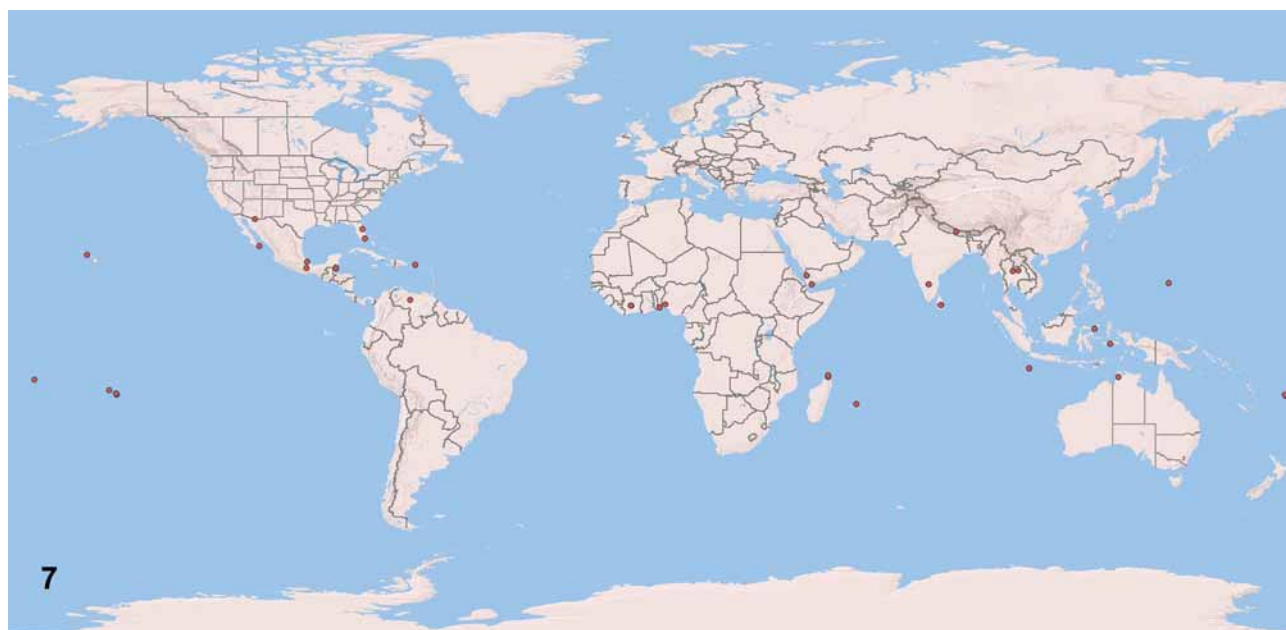


FIGURE 7. Geographic distribution of *Calliscelio elegans* (Perkins).

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Note added in proof. An additional female specimen was collected with the following data: UNITED ARAB EMIRATES: Sharajh x Khor Kaba, near tunnel, 29°59'N 56°09'E, 31.V-17.VI.2006, light trap, A. van Harten #9023; deposited in CNCI.

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