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Nomenclatural Act

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First report of *Watshamia* Bouček, 1974 (Hymenoptera: Chalcidoidea: Pirenidae) from the New World, with description of a new species

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Abstract. Only six out of a total of 25 genera of Pirenidae have been recorded from the New World. Here we report the presence of a seventh genus, *Watshamia* Bouček, 1974 (Hymenoptera: Chalcidoidea: Pirenidae), and describe *Watshamia sasa* Hanson & Jansen-González, **sp. nov**. from Costa Rica This finding suggests that additional genera of Pirenidae may eventually be found in the Neotropics and that in attempting to identify genera of poorly studied taxa, Old World genera should not be discounted. A brief discussion is provided of characters used to separate Pireninae from Tridyminae, as well as an updated summary of the biology of Pirenidae.

Keywords: cecidomyiid parasitoids, Costa Rica, Neotropics, taxonomy.

Pirenidae, formerly placed in Pteromalidae, is a cosmopolitan family characterized by having antennae inserted in the lower part of the head, with five or six visible flagellomeres between the pedicel and the clava, notauli complete, and mesoscutellum with frenum usually visible at least laterally (for a more detailed description, see Mitroiu et al. 2025). The family consists of 25 genera and more than 200 described species, which are classified in five subfamilies (Mitroiu et al. 2025). Only six genera in three subfamilies are presently known from the New World: Cecidellinae (one genus), Pireninae (two genera), and Tridyminae (three genera) (UCD Community 2023). Pireninae, the subfamily to which *Watshamia* Bouček, 1974 (Hymenoptera: Chalcidoidea: Pirenidae) belongs, consists of eight genera worldwide and is characterized by: eyes not or only slightly divergent in ventral half (at least in females); stigmal vein short, mostly straight and forming a less acute angle with postmarginal vein; female antenna with at most 3 large flagellomeres and at least 2 anelliform flagellomeres before the clava (see Mitroiu et al. 2025 for a key to subfamilies).

The genus *Watshamia* was described by Bouček (1974), with *Watshamia versicolor* Bouček, 1974 from Zimbabwe and South Africa as the type species. In the same publication two additional species were described, *Watshamia turneri* Bouček, 1974 from Namibia and South Africa, and *Watshamia malaica* Bouček, 1974 from Malaysia. Later a fourth species was described, *Watshamia gero* Mitroiu, 2013 from Kenya. *Watshamia* has several distinctive characteristics: a bright blue coloration (most Pirenidae are non-metallic), fore wings with very sparse pilosity, postmarginal and stigmal veins very short, and parastigma and stigma enlarged. As is the case for three of the five subfamilies of Pirenidae (Cecidellinae: Pireninae: Tridyminae), *Watshamia* species are associated with gall-forming Cecidomyiidae (Diptera): *W. gero* has been reared from a "cecidomyiid forming stem end galls" and *W. versicolor* from undetermined galls on *Rhoicissus tridentata* (Vitaceae) (Mitroiu 2013), while *W. malaica* was reared from a gall of *Asphondylia* sp. on *Dryobalanops aromatica* C.F.Gaertn. (Dipterocarpaceae) (Bouček 1974).

Because *Watshamia* has only been reported from the Paleotropical Region, we felt it important to report the discovery of this genus in Costa Rica which, to the best of our knowledge, is the first record from the New World. Despite collecting with Malaise traps from about 40 sites distributed throughout the country for more than 150 trap-years, as well as extensive rearing of plant galls (Hanson et al. 2014), only one specimen has been found to date.

The specimen was collected in a Malaise trap as part of a biodiversity evaluation in the Lomas de Barbudal Biological Reserve (Sasa et al. 2022), dried with hexamethyldisilazane (HMDS, Heraty & Hawks 1998), and mounted on a card (Noyes 1982). Due to logistical limitations holotypes of the four Paleotropical species were not examined; however, the original descriptions and illustrations of these species (Bouček 1974; Mitroiu 2013) are sufficiently detailed to allow adequate comparison with the Costa Rican specimen. Observations were made with a Nikon SMZ 1000 stereo microscope (0.8–8.0x), a C-W10x B/22 eyepiece, an ED Plan nosepiece (1.5x/WD45), and a LED ring light (MIC-209/144). Measurements were done with an Olympus SZ X 10 stereo microscope (6.3x), a WHSZ10x H/22 eyepiece, and a LED ring light (Schott KL 1600). Photographs were taken with a Canon R7 coupled to a Canon MP-E 65mm ultra macro lens. Series of macro photographs at different depths of field were taken by attaching the camera and lens system to a Cognysis StackShot automated macro rail and images were stacked using Helicon Focus 7.

Terminology for morphological terms follows Burks et al. (2025), including the following abbreviations: **F1–F5** (flagellomeres 1–5), **OOL** (ocellocular line: distance between lateral ocellus and eye), **POL** (postocellar line: distance between lateral ocelli), The specimen is deposited in the Museo de Zoología, Universidad de Costa Rica, San José, Costa Rica (MZUCR).

Watshamia sasa Hanson & Jansen-González, sp. nov. (Figs. 1–2)

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Diagnosis. The female of this species can be recognized by the bright metallic blue body (Fig. 1A); toruli situated at level of lower eye margin; flagellum clavate, about same length as scape, and with F1 longer than anelliform F2; fore wing with broad dark band beneath the marginal vein, the latter very short, about 1/3 the length of the submarginal vein and slightly more than 2 times as long as the stigmal vein.

Description. Female. Body length 1.9 mm. Head in frontal view green ventrally, blue dorsally (Fig. 1B). Mesosoma mostly blue, lateral

lobes of mesoscutum darker, anterior mesoscutellum and axillulae green; meso- and metapleuron with violet. Metasoma dark brown with some faint metallic coloration, especially anteriorly. Antenna with scape yellowish brown dorsally, yellow ventrally; pedicel bluish dorsally, yellow ventrally; flagellum brown dorsally with some faint metallic coloration, lighter brown ventrally. Mandibles yellowish brown, teeth dark brown. Legs mostly brown, tarsi whitish with last tarsomere darker, coxae and hind femur with faint violet. Wings hyaline, venation light brown, parastigma and stigma darker; with broad brownish band beneath marginal vein, extending nearly entire width of wing.

Head in frontal view 1.3 × as broad as high, uniformly reticulate (Figs. 1B, 1D). Oral fossa 0.7 × head width. Mandibles with two large ventral teeth, right mandible with two small dorsal teeth, left mandible with one broad dorsal tooth (Fig 1C); with carina extending from second ventral tooth to inner mandibular margin; with scattered, long white setae. Clypeus about twice as broad as high, ventral margin straight and protruding, dorsal margin indistinct. Malar space 0.2 × eye height. Inner margins of eyes slightly diverging ventrally, height about 1.5 × length. Toruli separated by distance equal to torulus diameter. Scrobes shallow, visible only for a short distance above toruli. Ocelli forming equilateral triangle, POL about 0.9 × OOL. Antenna formula 1153, clavate, flagellomeres gradually widening toward clava (Fig. 1E); scape not reaching median ocellus, 0.6 × eye height and 0.6 × pedicel + flagellum; pedicel length in lateral view 1.7 × width, slightly longer than

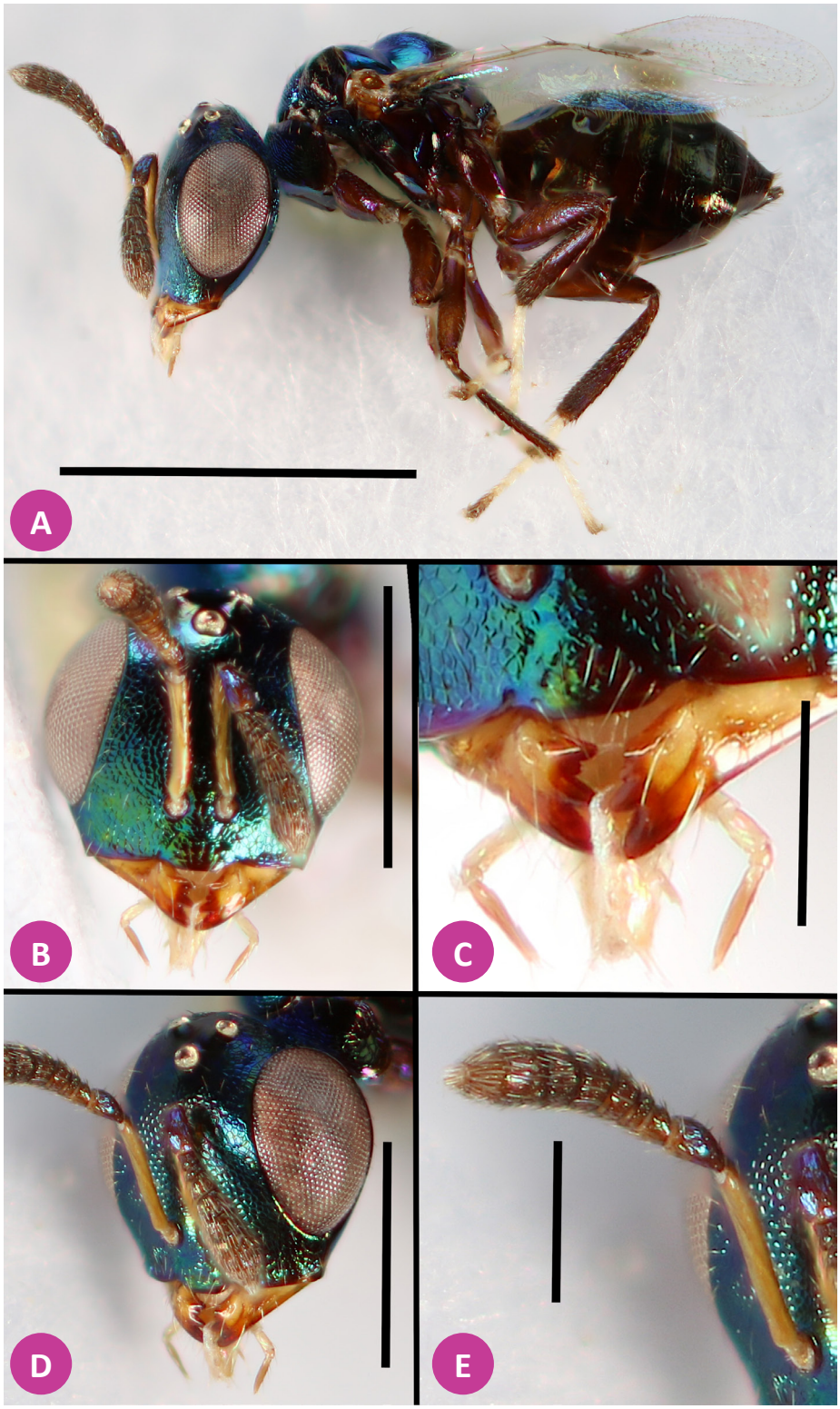

Figure 1. Habitus and head characteristics of *Washamia sasa* Hanson & Jansen-González, **sp. nov.** (Hymenoptera: Chalcidoidea: Pirenidae) A- Habitus; B- Head in frontal view; C- Close-up of B showing clypeal area and mouthparts in frontal view; D- Oblique view of head; E- Close-up of D showing detail of antenna. Scale bars: 1A 1mm; 1B 0.5mm; 1C 0.2mm; 1D 0.5mm; 1E 0.2mm.

F1 + F2; flagellum 1.3 × scape, F1 nearly as long as wide, F2–F5 wider than long, F2 anelliform; clava length 1.6 × width, ventral surface of clavomeres 2–3 with flattened micropilose area.

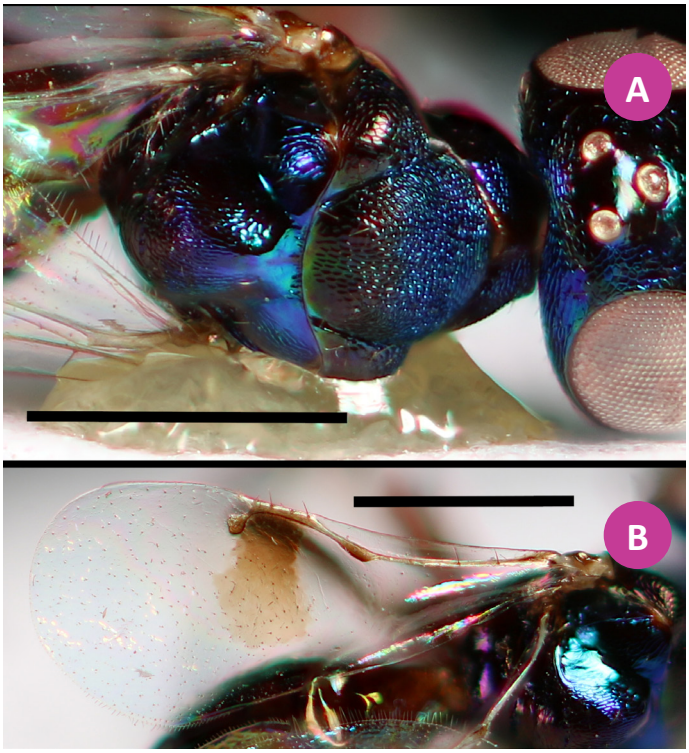

Figure 2. Mesosoma and wing of *Washamia sasa* Hanson & Jansen-González, **sp. nov.** (Hymenoptera: Chalcidoidea: Pirenidae) A- Mesosoma in dorsal view; B- Detail of forewing. Scale bars: 2A 0.5mm; 2B 0.5mm.

Mesosoma about 1.3 × as long as broad. Pronotum in dorsal view barely visible, faintly reticulate. Mesoscutum and scutellum faintly reticulate, axillae and axillulae smooth (Fig. 2A); midlobe of mesoscutum convex, descending anteriorly (Fig. 1A); lateral lobes of mesoscutum very convex and protruding; mesoscutellum very convex, frenal line distinct; axillae steeply inclined. Prepectus large, faintly reticulate posteriorly, anterior part directed inward where it extends ventrally to level of fore coxa. Mesepisternum faintly reticulate dorsally and anterior to femoral depression (though latter is flat); rest of mesopleuron and entire metapleuron smooth. Propodeum mostly smooth, callus bare. Fore wing (Fig. 2B) reaching posterior end of gaster, about 2.2 × as long as wide; marginal fringe absent except on hind margin where very short; basal half of wing membrane bare (basal cell not demarcated by setae, speculum reaching stigmal vein), apical half with scattered short setae; submarginal vein 3.3 × marginal vein, the latter 2.4 × stigmal vein; postmarginal vein much shorter than stigmal vein.

Metasoma not strongly compressed laterally (at least when dried with HMDS), 1.2 × length of mesosoma. First gastral tergum the longest, hypopygium reaching about midlength of gaster, ovipositor sheaths not protruding.

Male. Unknown.

Material examined. HOLOTYPE female (MZUCR), Costa Rica, Guanacaste, Lomas Barbudal Biol. Res., Malaise trap, 13.v.2016, M. Sasa.

Distribution. Presently known only from Costa Rica.

Remarks. This new species is similar to *W. malaica* in that the female fore wing has a broad dark band below the marginal vein and lacks a dark band below the parastigma. However, it differs by having the antennae inserted at the lower extremities of the eyes (as in *W. turneri*) as opposed to inserted above the lower eye margin, the first flagellar segment is not transverse and the hind margin of the eye is convex as opposed to slightly emarginate; in these last two characters the new species is more similar to *W. versicolor* (see Bouček 1974 and Mitroiu 2013 for descriptions and images of previously described species; the second author provided a key to the three African species).

Etymology. This species is named in honor of our friend and colleague, Dr. Mahmood Sasa (University of Costa Rica), principal investigator of the project in which this species was discovered. The name is used as a noun in apposition.

Discussion. In the key to subfamilies of Pirenidae (Mitroiu et al. 2025) one of the characters used to separate Pireninae from Tridyminae is "marginal vein at least 3.5 x as long as stigmal vein", as opposed to "at most 3 x as long as stigmal vein" in Tridyminae. However, with respect to this character *W. sasa* more closely resembles Tridyminae than Pireninae, suggesting that more emphasis should be placed on the other characters used in this key: females of Pireninae have at least 2 anelliform flagellomeres (as opposed to one or none in Tridyminae) and at most 3 large flagellomeres before the clava (as opposed to 4–5 in Tridyminae). Mitroiu et al. (2025) also noted that Tridyminae tend to have the fore wing with the stigmal vein forming a more acute angle with the postmarginal vein than in Pireninae. A character deserving further study is the maxillary palp. Based on very preliminary observations, in *Watshamia* and *Macroglenes* Westwood, 1832 the third maxillary segment is the shortest and the fourth (apical) is about as long as the previous three combined (Fig. 1C), whereas in *Gastrancistrus* Westwood, 1833 the third segment is the second longest and the fourth is shorter than the previous three combined. However, more thorough studies of this and other neglected characters are needed.

The fact that *Watshamia* has not previously been reported from the New World suggests that in attempting to identify Neotropical genera of poorly studied taxa such as Pirenidae, one should not ignore Old World genera. Our results also indicate that some taxa can be extremely rare in collections. Despite the intensity of collecting that has occurred in Costa Rica over the past 30 plus years, we have only one specimen of *Watshamia*. Finding its host(s) would probably resolve this situation.

With respect to the biology of Pirenidae, species in the two subfamilies known only from the Old World (Eriaporinae and Euryischiinae) appear to be parasitoids or hyperparasitoids of Coccoidea (Hemiptera) (see references in Mitroiu et al. 2025). Species in the other three subfamilies are associated with plant galls, especially those formed by Cecidomyiidae (Diptera). In Cecidellinae only *Cecidellis nigriseta* Hanson, 2005 has been observed in detail; it is associated with various cecidomyiid galls and with a braconid gall on *Philodendron radiatum* (Araceae). In the latter gall this species appears to be an ectoparasitic idiobiont (Heydon & Hanson 2005). While members of the other two subfamilies (Pireninae and Tridyminae) are also associated with cecidomyiid galls, available evidence indicates that they are endoparasitic koinobionts: *Macroglenes penetrans* (Kirby, 1800) oviposits into eggs and emerges from larvae (Doane et al. 1989), two unidentified species of *Gastrancistrus* oviposit into first-instar larvae and emerge from later-instar larvae (Chen & Appleby 1984, cited as *Tridymus*; Sarfati et al. 2010), and *Gastrancistrus hamillus* Walker, 1848 oviposits into larvae and emerges from pupae in the soil (Askew & Ruse 1974). Further research is required to determine whether *Watshamia* species have a biology similar to that of *Macroglenes*, and to substantiate the difference in biology between Cecidellinae on the one hand, and Pireninae and Tridyminae on the other.

Taxonomic Authorities

Watshamia Bouček, 1974 in Bouček (1974). *Watshamia versicolor* Bouček, 1974 in Bouček (1974). *Watshamia turneri* Bouček, 1974 in Bouček (1974). *Watshamia malaica* Bouček, 1974 in Bouček (1974). *Watshamia gero* Mitroiu, 2013 in Mitroiu (2013). *Macroglenes* Westwood, 1832 in Westwood (1832). *Gastrancistrus* Westwood, 1833 in Westwood (1833). *Cecidellis nigriseta* Hanson, 2005 in Heydon & Hanson (2005). *Macroglenes penetrans* (Kirby, 1800) in Kirby (1800). *Gastrancistrus hamillus* Walker, 1848 in Walker (1848).

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Authors' Contributions

PEH: Conceptualization, Writing - original draft, Writing – review & editing; SJG: Conceptualization, Illustrations, Writing – review & editing.

Conflict of Interest Statement

Authors declare there are no conflicts of interest.

Ethical Approval

Ethics approval is not applicable.

Data Availability

Additional data are available from the first author.

Generative AI Statement

AI was not used in the preparation of this paper.

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