The genus *Coccobius* new for Mexico, with description of a new species and key to Nearctic species (Hymenoptera: Aphelinidae)

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Coccobius juliae sp. n. is described from Mexico and a key to Nearctic species of the genus *Coccobius* is given.

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Species of the aphelinid genus *Coccobius* Ratzeburg are mostly parasitoids of armored scales (Homoptera: Diaspididae). Females develop as primary parasitoids, males are hyperparasitoids of their own or other hymenopteran species. Thus, they have significance in the natural control of scales.

Currently 79 species of the genus *Coccobius* are known in the fauna (Jasnosh, 1968; Tachikawa, 1981; Hayat, 1983, 1984; Jasnosh & Mustafaeva, 1992; Myartseva, 1995; Prinsloo, 1995; Evans & Pedata, 1997). Seven species are known to occur in the Nearctic Region. *C. flaviventris* (Howard), *C. fulvus* (Compere & Annecke) and *C. testaceus* (Masi) were introduced into USA (Evans & Pedata, 1997; Woolley, 1997). Results of the introduction of the European species *C. testaceus* into USA are not clear and are in need of confirmation: Flanders (1942) and Clausen (1978), had not been recovered; Gordh (1979), had possibly established, and Evans & Pedata (1997) made no comments regarding its establishment. In the Nearctic Region only 4 native species of *Coccobius* have been described. These are: *C. donatellae* Pedata & Evans, *C. howardi* (Compere), *C. stanfordi* (Howard), and *C. varicornis* (Howard). *C. juliae*, a new species from Mexico, is the first record of the genus *Coccobius* in Mexico.

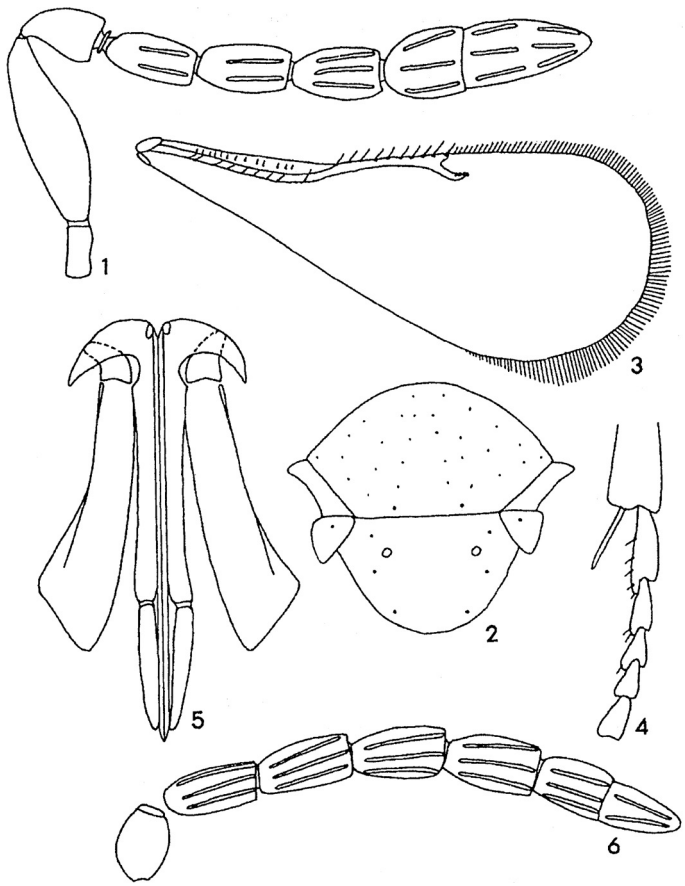
The new species was reared by the author from a diaspine scale on pine (*Pinus*) in the Biosphere Reserve "El Cielo" in the mountains Sierra Madre Oriental, the State Tamaulipas, situated in the north-east of Mexico. Terminology used is according to Hayat (1984), with the following abbreviations for antenna: R – radicle, S – scape, P – pedicel, F_1-F_6 – flagellum (funicle + club) segments. In the key are shown host species distributed in the Nearctic Region.

Genus **Coccobius** Ratzeburg, 1852

Synonyms: *Physcus* Howard, 1895; *Encyrtophyscus* Blanchard, 1948; *Physculus* Jasnosh, 1977.

Type species *Coccobius annulicornis* Ratzeburg, 1852.

The classification of the aphelinid genera into subfamilies and tribes is still in the formative stage. Jasnosh (1976) placed the genus *Coccobius* in the subfamily Physcinae. Hayat (1985) included it in the subfamily Coccophaginae, tribe Coccophagini. The genus is almost cosmopolitan in distribution. It is characterized mainly as follows: mesopleuron large, undivided; fore wing without linea calva; antennae with very minute anellus, 7-segmented in female and 7- or 8-segmented in male; axillae small, barely projecting forwards; mesoscutum with numerous setae; scutellum broadly rounded at apex and with 2-3 pairs of setae; submarginal vein with 4 and more setae; length of body 0.4 to 1.2 mm, usually 0.8-1.0 mm. Colour ranging



Figs 1-6. *Coccobius juliae* sp. n.: **1**, antenna, female; **2**, mesosoma; **3**, fore wing; **4**, mesotibial spur and middle tarsus; **5**, ovipositor; **6**, antenna, male.

from yellow to black; antennae often with dark and pale segments forming a distinct colour pattern, rarely funicle uniformly coloured.

Coccobius juliae sp. n.
(Figs 1-6)

Holotype. ♀, **Mexico**, *Tamaulipas*, Gómez Farías, Reserve "El Cielo", La Perra (1900 m), 23.X.1998 (S. Myartseva).

Paratypes. 2 ♀, 1 ♂, as holotype.

The holotype and one paratype male of the new species are preserved in the collection of National Museum of Natural History, Washington, D.C., USA; one paratype is deposited in the collection of Department of Zoology, Institute of Biology, Autonomous National University of Mexico (UNAM), Mexico, D.F., and one paratype in the collection of Zoological Institute, Russian Academy of Sciences, St.Petersburg, Russia.

Description. Female. Head about as wide as mesosoma, its width slightly more than twice and its height twice its own length, Face with depression; malar space with sulcus; eyes setose, less than 2.5 times as long as malar space; frontovertex 1.5 times as wide as long, its posterior margin rounded and slightly concave; ocelli in acute-angled triangle, distance from posterior ocelli to ocular margins and occipital margin about 1.5 diameters of an ocellus. Antennae (Fig. 1) inserted on the level of lower margin of eyes. Antennal radicle (R), scape (S), pedicel (P), 3 funicle segments (F_1-F_3) and 2 club segments (F_4-F_5) with following ratios of length to width: R – 2.1, S – 3.3, P – 1.8, F_1 – 2.1, F_2 – 1.9, F_3 – 1.6, F_4 – 1.3, F_5 – 1.9; relative length of each segment to length of F_1: R – 0.6, S – 2.2, P – 0.9, F_1 – 1.0, F_2 – 1.0, F_3 – 1.0, F_4 – 1.0, F_5 – 1.3. Flagellar segments F_1-F_3 with 2 each, F_4-F_5 with 3 linear sensillae, respectively. Club slightly longer than scape, and slightly longer than 2 preceding funicle segments combined also. Mesosoma (Fig. 2) as long as wide; mesoscutum and scutellum broad, each slightly less than twice as wide as long; mesoscutum finely reticulately sculptured with rounded cells, and with scattered setation; scutellum with 3 pairs of setae, its sculpture more coarse than on mesoscutum and cells in the middle part extended longitudinally. Fore wing (Fig. 3) hyaline, slightly less than 2.5 times as long as wide, with short setation; maximum length of marginal fringe about 1/9 of maximum width of wing; basal part of wing setose; costal cell slightly more than

twice as wide as submarginal vein, with a row of short setae; submarginal vein with 7-8 setae; marginal vein shorter and with 10-11 setae along its anterior margin; stigmal vein very short. Midtibial spur approximately as long as basitarsus; length of basitarsus equal to length of 2nd and 3rd tarsal segments combined (Fig. 4). Metasoma slightly longer than mesosoma; ovipositor (Fig. 5) slightly protruded; valvular II slightly longer than valvular I; sheaths less than half as long as valvular II.

Pedicel brownish black; funicle and club yellowish brown. Wings hyaline; veins pale yellow. Legs brownish black, except brownish yellow apices of tibiae and tarsi; last segment of all tarsi infuscated.

Body length 0.88-1.10 mm.

Male. Differs from the female in the structure of antennae (8-segmented), wings and genitalia. Length/width ratios of antennal segments P-F_6 as follows: P – 1.2, F_1 – 3.7, F_2 – 3.2, F_3 – 2.9, F_4 – 2.5, F_5 – 2.2, F_6 – 2.7; scape flattened. F_1-F_5 flagellar segments with 3 linear sensillae each, F_6 with 2 sensillae (Fig. 6). Fore wing broader, about 1.5 times as long as wide. Coloration similar to that of female.

Body length 0.80 mm.

Comparison. C. juliae is most similar to *C. ephedraspidis* Jasnosh for its uniformly coloured antennal flagellum, having the F_1-F_3 flagellar segments subequal in length to F_4, similar setation of submarginal and marginal veins of the forewing, but distinguished by the dark brown head, pale yellow venation of fore wings, length/width ratios of flagellar segments, and sculpture of mesoscutum and scutellum (in both sexes).

Biology. C. juliae was reared from a diaspine scale (Diaspididae) infesting young twigs of *Pinus* spp. in the pine forest situated in the mountains Sierra Madre Oriental.

Etymology. This species is named in honour of author's daughter Julia celebrating her jubilee in Ashgabat, Turkmenistan.

Key to Nearctic species of the genus *Coccobius* (females)

1. Head and mesosoma mostly yellow 2
– Head and mesosoma mostly dark brown to black 4
2. Antennal club (F_4-F_5) by 1/10 shorter than funicle (F_1-F_3). F_1 longer than P. F_1 of male brown. – USA (introduced into California from Taiwan and established); China, Taiwan, Japan (introduced). Host: *Coenoaspis beckii* (Newman) . . . . . **C. fulvus** (Compere & Annecke, 1961)
– Antennal club (F_4-F_5) and funicle (F_1-F_3) subequal in length. F_1 not longer than P 3
3. F_1 and club (F_4-F_5) (except apical part) almost black; F_2 greyish. Head of male entirely dark brown; scape with a large, elongated glandular area. – USA (introduced into California from Europe for the control of *Lepidosaphes ulmi* L. and *L. conchiformis* (Gmelin); Palaearctic . . . . . **C. testaceus** (Masi, 1910)
– F_1 and club (F_4-F_5) greyish; F_2 yellowish. Head of male with occiput yellow; scape with a short, circular glandular area. – USA (Florida). Host: *Comstockiella sabalis* (Comstock) on palm *Sabal palmetto* and *Serenoa repens* . . . . . **C. donatellae** Pedata & Evans, 1997
4. F_1-F_5 uniformly brownish yellow or yellowish brown; F_1-F_3 subequal in length. – Mexico (Tamaulipas). Host: diaspine scale on *Pinus* spp. . . . . **C. juliae** sp. n.
– F_1-F_5 not uniformly coloured, with some segments contrasting in coloration 5
5. F_1-F_3 white. Gaster yellow. Mesoscutum with longitudinal reticulate sculpture. – USA (introduced into Texas); Philippines. Host: *Aonidiella aurantii* (Maskell) . . . . . **C. flaviventris** (Howard, 1910)
– F_1-F_3 not entirely white, or of another colour. Gaster dark brown or black 6
6. F_2-F_3 dusky yellow to pale brown. Gaster brownish. Mesoscutum with large, hexagonal sculpture. Marginal vein with 14-15 setae. – USA (California). Host: *Stramenaspis kelloggi* (Coleman) . . . . . **C. stanfordi** Howard, 1914
– F_2-F_3 differently coloured 7
7. Funicle segments increasing in length from F_1 to F_3. F_1 about as long as pedicel. Marginal vein with 8 setae. – USA (Washington, D.C.); Canada, ?Mocambique. Host: *Aspidiotus* sp. on *Tilia* . . . . . **C. varicornis** (Howard, 1881)
– Funicle segments decreasing in length from F_1 to F_3. F1 about 1.5 times as long as pedicel. – USA (California). Hosts: *Nuculaspis californica* (Coleman), *Phenacaspis pinifoliae* (Fitch) on pine . . . . . **C. howardi** (Compere, 1928)

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