

**A NEW ANAGRUS (HYMENOPTERA: MYMARIDAE), EGG
PARASITOID OF *IDONA MINUENDA* (HOMOPTERA:
CICADELLIDAE), A PEST OF AVOCADO IN MEXICO**

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RESUMEN. Se describe e ilustra una nueva especie guatemalteca y mexicana de *Anagrus* Haliday, un género de avispas mimáridos. En Tamaulipas, México, este especie es un parásito oófago de la chicharrita *Idona minuenda* (Moznette) sobre aguacate.

PALABRAS CLAVE: *Anagrus*, Mymaridae, parásito oófago, *Idona minuenda*, aguacate.

ABSTRACT. A new species of the mymarid wasp genus *Anagrus* Haliday is described and illustrated from Guatemala and Mexico. In Tamaulipas, Mexico, this species was found parasitizing eggs of the leafhopper *Idona minuenda* (Moznette) on avocado.

KEY WORDS: *Anagrus*, Mymaridae, egg parasitoid, *Idona minuenda*, avocado.

The mymarid genus *Anagrus* Haliday includes several species of economic importance in America south of the United States (Triapitsyn, 1997). In that paper, I incorrectly identified a female specimen from Manzanillo, Colima, Mexico, as *Anagrus takeyanus* Gordh. After more specimens conspecific with the one from Manzanillo were received, it became clear that they all represent a new, previously undescribed species that morphologically is closely related to *A. takeyanus*. Some of them were collected in Guatemala from avocado leaves, thus providing an indication of a possible avocado-inhabiting leafhopper host, an association that nevertheless remained unknown until recently.

When visiting Universidad Autónoma de Tamaulipas in Ciudad Victoria, Mexico, in April 1999, I noticed that all the avocado trees on the University campus and throughout the city were heavily infested with a leafhopper species, whose adults and nymphs were feeding on the leaves, causing a considerable damage. In collaboration with the researchers from el Laboratorio del Control Biológico, Universidad Autónoma de Tamaulipas, adult leafhoppers were collected by sweeping and preserved exemplars were sent to Raymond J. Gill (California Department of Food and Agriculture, Sacramento, USA) who confirmed that they are *Idona minuenda* (Moznette). This species was listed as a minor pest of avocado in Mexico (SARH-DGSV, 1983) and is mentioned by González Hernández *et al.* (2000) as chicharrita del aguacate, *Idinia* [sic] *minuenda*.

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Simultaneously, avocado leaves with signs of leafhopper damage were collected into a carton container with a glass vial screwed into carton's lid. After three days of exposure to the constant light source in the laboratory, several adult *Anagrus* wasps emerged into the vial; later, after some of them were slide-mounted, they were found to belong to the same species as the series of specimens from Guatemala. At the same time, I found parasitized eggs of *I. minuenda* by dissecting tissue from the collected avocado leaves, thus confirming that the parasitoids emerged from the eggs of this leafhopper host. A few adult parasitoids were also collected in Ciudad Victoria from avocado leaves in a private garden by sweeping the leafhopper-infested trees with a net.

All the material resulting from this four-day study was preserved in 70% ethanol and deposited in the insect collection of the Laboratorio del Control Biológico, Universidad Autónoma de Tamaulipas. A loan of *Anagrus* egg parasitoids from this collection has enabled me to properly prepare voucher specimens which are a part of the paratype series of the new species described below.

Terminology and the choice of morphological features used in this paper are that of Chiappini *et al.* (1996). Measurements are given in micrometers (μm), with the mean followed, in parentheses, by the range. Acronyms for collections are as follows: CNCI, Canadian National Collection of Insects, Ottawa, Canada; IEFA, E. Chiappini collection, Istituto di Entomologia, Piacenza, Italy; IMLA, Fundación e Instituto Miguel Lillo, San Miguel de Tucumán, Argentina; UCRC, University of California, Riverside, USA; UATM, Universidad Autónoma de Tamaulipas, Ciudad Victoria, Mexico; USNM, National Museum of Natural History, Washington, D.C., USA. An abbreviation used in the description is: F = funicular (flagellar in males) segment.

Anagrus (Anagrus) raygilli S. Triapitsyn sp. nov. (Figs. 1-5)

Anagrus takeyanus Gordh; Triapitsyn, 1997: 4 (misidentification).

Type material. HOLOTYPE female [USNM] on point, labeled: 1. "GUATEMALA: Sacatepequez, Chyllá, 14°37'N, 90°41'W, 26.x.1998, el. 7032 ft. M. Hoddle, on avocado"; 2. "*Anagrus (Anagrus) raygilli* S. Triapitsyn female HOLOTYPE". PARATYPES: GUATEMALA: same data as holotype, 4 females on points; same except 14°38'N, 90°42'W, el. 6877 ft., 5 females on points and 3 females on slides [UCRC]. MEXICO: Colima, Manzanillo, 8.viii.1984, G. Gordh, 1 female on slide; Guerrero, 30 km N. of Acapulco, 6.viii.1984, G. Gordh, 1 female on slide; Morelos, Amatlán, 14 km N. of Yauatepec, 29.x.1982, J.T. Huber, 1 female on slide; Nuevo León: Monterrey, Chipinque, el. 1000 m, 2.xi.1982, J.T. Huber & A. González H., 1 female on slide; San Juan, Río San Juan, 14.vii.1983, F. Reyes V., 1 female on slide; Veracruz, 33 mi. S. of Nautla, 31.x.1982, J.T. Huber & A. González H., 1 female on slide [UCRC]; Tamaulipas, Ciudad Victoria, Tamatlán, coll. 20.iv.1999, em. 23.iv.1999, S. Triapitsyn, 1 female, 2 males on points and 1 female, 2 males on slides (ex. *Idona minuenda* (Moznette) eggs on avocado leaves); same

data except coll. 23.iv.1999, 1 female, 1 male on points and 2 males on slides (swept from avocado leaves infested with *I. minuenda*) [CNCI, IEFA, IMLA, UATM].

Description. FEMALE ($n=7$). *Color:* Body and appendages light brown or pale (some live specimens light orange) with the following brown: antennal club, anterior half of mesoscutum, wing venation.

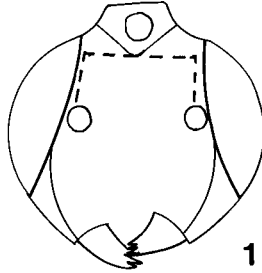


Fig. 1. *Anagrus raygilli* sp. nov. head (frontal view, Guatemala), female.

Head: Markedly wider than mesosoma in dorsal view; vertex flat and strongly produced forward anteriorly beyond eye margin so that head appears almost triangular in lateral view and is seen as a projection in frontal view (Fig. 1). Antenna (Fig. 2) with F1 globular, much shorter than 1/2 length of pedicel, F2 and F3 subequal and each much shorter than following segments, F6 the longest; F2, F3 and F5 without sensory ridges, F4 and F6 each with 2 sensory ridges (F4 sometimes with only one); club longer than combined length of two preceding segments and with 5 sensory ridges.

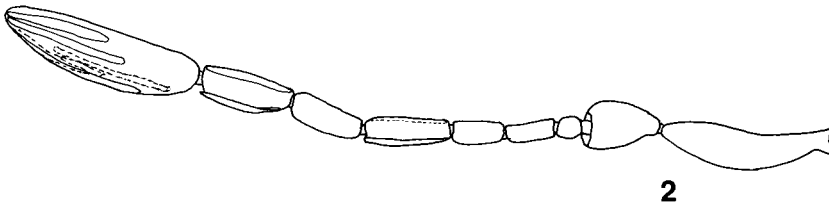


Fig. 2. *Anagrus raygilli* sp. nov., antenna, female (Guatemala).

Mesosoma: Slightly shorter than metasoma. Mesoscutum with a pair of adnotaular setae. Forewing (Fig. 3) shorter than body, 7.6 (6.9-8.2) x as long as wide; with several irregular rows of discal setae beyond venation, leaving small bare area in broadest part of blade near posterior margin. Distal and proximal macrochaetae almost equal in length.

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Metasoma: Ovipositor slightly exerted beyond apex of metasoma. Ratio of total ovipositor length to length of its exerted part 8-12:1. External plates of ovipositor each with 2 setae. Ovipositor length: foretibia length ratio 2.3 (2.2-2.5):1.

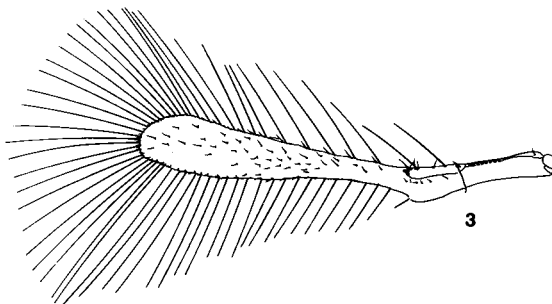


Fig. 3. *Anagrus raygilli* sp. nov., forewing, female (Guatemala).

Measurements ($n=5$): Body: 547 (429-630); Mesosoma: 209 (150-237); Metasoma: 243 (164-310); Ovipositor: 230 (208-299). Antenna: Scape: 80 (69-91); Pedicel: 37 (34-40); F1: 15 (13-16); F2: 26 (24-30); F3: 27 (22-33); F4: 40 (35-44); F5: 40 (37-44); F6: 48 (44-52); Club: 105 (95-117). Forewing (length/width): 475 (398-529)/63 (51-73); Proximal macrochaeta: 66 (58-73); Distal macrochaeta: 68 (51-80); Longest marginal cilia: 182 (168-190). Hindwing (length/width): 430 (372-475)/21 (18-24); Longest marginal cilia: 158 (135-175). Legs (given as femur, tibia, tarsus): fore: 104 (91-128), 99 (91-116), 136 (128-146); middle: 94 (74-120), 141 (117-164), 129 (117-139); hind: 101 (87-124), 145 (121-175), 132 (111-153).

MALE. Similar to female except general body color darker (metasoma dark brown), antenna brown, F10 and F11 club-like but clearly separated by a suture (Fig. 4), similar to that of *A. brasiliensis* S. Triapitsyn (Triapitsyn, 1997); forewing wider than in female: length/width ratio 6.8 (6.6-7.1). Genital capsule peculiar in shape (Fig. 5), digiti not hook-like.



Fig. 4. *Anagrus raygilli* sp. nov., antenna, male (Mexico: Tamaulipas)

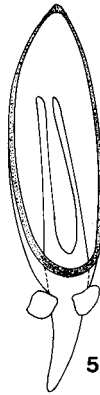


Fig.5. *Anagrus raygilli* sp. nov., genitalia, male (Mexico: Tamaulipas).

Measurements ($n=4$): Body: 483 (412-540). Antenna (Fig. 4): Scape: 50 (47-51); Pedicel: 35 (33-37); F1: 29 (29-30); F2: 34 (31-37); F3: 32 (30-35); F4: 34 (33-37); F5: 35 (33-37); F6: 38 (34-41); F7: 36 (34-39); F8: 38 (36-40); F9: 38 (37-41); F10: 41 (40-44); F11: 41 (38-43). Forewing (length/width): 429 (414-442)/63 (62-66). Genitalia: 91 (80-95).

Diagnosis. This species possesses the following unique combination of features: head much wider than mesosoma; female antenna with F2 and F3 very short and without sensory ridges, F4 and F6 with 2 sensory ridges each, F5 without sensory ridges; mesoscutum with a pair of adnotaular setae; forewing disc with a bare area in the broadest part, forewing venation with proximal and distal macrochaetae subequal in length. The closest species to *A. raygilli* are *A. takeyanus* Gordh and *A. tretiakovae* S. Triapitsyn. *Anagrus takeyanus* lacks adnotaular setae on the mesoscutum and has a shorter and wider forewing in females (length/width ratio 5-6:1). *Anagrus tretiakovae* females have a sensory ridge on F5, and males have differently shaped genital capsule and hooked digits (Triapitsyn, 1998).

Host. *Idona minuenda* (Moznette) (Cicadellidae).

Etymology. The new species is named after Raymond J. Gill, the Homoptera biosystematist at the California Department of Food and Agriculture, in recognition of his long-time generous assistance with numerous identifications of the leafhopper hosts of mymarid wasps.

Comments. *A. raygilli* is a member of the *incarnatus* species group of the subgenus

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Anagrus s. str., as defined by Chiappini et al. (1996). The new species may be confused with *Anagrus takeyanus* Gordh, which has not yet been found outside of Japan and the USA (including the Hawaiian Islands). *Anagrus raygilli* is known only from the leafhopper host (*I. minuenda*) whereas *A. takeyanus* parasitizes eggs of two tingid hosts: *Stephanitis pyrioides* (Scott) and *S. takeyai* Drake & Maa (Chiappini et al., 1996). The new species would key to the same couplet as *A. takeyanus* in Triapitsyn (1997), replacing it in the key.

Other material examined. *Anagrus (Anagrus) takeyanus* Gordh: HOLOTYPE female on slide labeled: 1. "ANAGRUS TAKEYANUS GORDH Holo-Type No. 73812 U.S.N.M."; 2. "Mt. Carmel [Shelton CT., - crossed out] 1975 ex: *Stephanitis takeyai* eggs D. M. Dunbar PPRI Holotype" [USNM].

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