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First record of parasitism of cockroaches (Blattaria: Blattellidae) by *Anisia optata* (Reinhard) (Diptera: Tachinidae)¹

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ABSTRACT: Two specimens of *Anisia optata* (Reinhard) were reared from wood cockroaches (*Parcoblatta* species and possibly *Ischnoptera deropeltiformis* (Brunner)) collected near Raleigh, North Carolina, in 2001. This is the first host record for *A. optata* and the first record of cockroach parasitism in the genus *Anisia* Wulp (Tachinidae, Exoristinae, Blondeliini).

Parasitic flies of the family Tachinidae are endoparasitoids of other arthropods, chiefly in the insect orders Lepidoptera, Coleoptera, Hemiptera, Hymenoptera (Symphyta) and Orthoptera. Parasitism of cockroaches (order Blattaria) by Tachinidae is relatively rare and the species of only one genus, *Calodexia* Wulp (Exoristinae, Blondeliini), are cited as cockroach parasitoids in the New World by Guimarães (1977) and Arnaud (1978). *Calodexia* is a Neotropical genus of over 30 described species and is not found north of Mexico. Recently, O'Hara (2002) published the first report of cockroach parasitism by Tachinidae in America north of Mexico, recording *Exoristoides blattarius* O'Hara (Tachininae, Polideini) as a parasitoid of *Parcoblatta* sp(p). and possibly *Ischnoptera deropeltiformis* (Brunner) (Blattellidae).

O'Hara's (2002) records of cockroach parasitism were based on rearings by the senior author of wood cockroaches collected in the vicinity of Raleigh, North Carolina, in 1999 and 2001. **We report here on a second tachinid species, *Anisia optata* (Reinhard 1942) (Exoristinae, Blondeliini), reared from the cockroaches collected in 2001.**

Cockroach parasitism by *A. optata* was discovered and documented in the following manner. Cockroaches were collected in pitfall traps baited with bread soaked in beer in spring to fall of 2001 in wooded areas (mainly loblolly pine, *Pinus taeda* L.) near Raleigh, North Carolina. The cockroaches were reared in the laboratory at $27 \pm 1^\circ\text{C}$ under a 12:12 (light:dark) photoregime in clear plastic cages and provided with food (rat chow) and water *ad libitum*. Most of the individuals collected were *Parcoblatta caudelli* Hebard, *P. lata* (Brunner), *P. uhleriana* (Saussure) and *P. virginica* (Brunner), followed by lesser numbers of *P. pensylvanica* (De Geer) and/or *P. divisa* (Saussure and Zehntner), **plus** a few *P. bolliana* (Saussure and Zehntner) and *Ischnoptera deropeltiformis* (Brunner). **Only nymphs and adult females were collected in the pitfall traps (no adult males) and these were kept in separate cages.** New puparia and adult flies were collected every 2-3 days from these cages, but no record was kept of which cage the parasitoids were collected from. Puparia were found **in confined spaces** in the cages out of reach of the cockroaches, indicating that the fly larvae moved away from their hosts after emergence. Judging from the size of the puparia relative to the size of the cockroaches, it is very likely that hosts died when the fly larvae emerged, but this was not directly observed **as dead cockroaches were consumed by living cockroaches.** Puparia were placed individually or in groups in glass vials and observed several times per week for adult emergence, which usually occurred 1-3 weeks after cockroaches were collected. Adult flies and associated puparia were placed in 75% ethanol and later soaked in ethyl acetate for a few hours, air-dried, pinned (with each puparium

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in a gelatin capsule below the appropriate adult) and labelled. Most of the reared tachinids were *Exoristoides blattarius* but two were *A. optata*.

Our record of cockroach parasitism by *A. optata* is the first host record for this species and the first record of cockroach parasitism for *Anisia* Wulp. *Anisia optata* is an eastern species with a distribution from Ontario to Massachusetts south to Louisiana and Florida (Sabrosky and Arnaud 1965, and specimens in the Canadian National Collection of Insects [CNC]). This distribution is quite similar to the distribution of most eastern *Parcoblatta* species (Atkinson et al. 1991). The identification of the two reared specimens, both males, was made by JEOH based on comparisons with the male holotype of *A. optata* in CNC. Both reared specimens have been deposited in CNC.

Anisia is a strictly New World genus ranging from southern Canada to South America (Wood 1985). Hosts are known for only a few of the 16 described species, as follows (the catalogs of Guimarães 1977 and Arnaud 1978 are cited where possible for brevity; original rearing records are cited therein):

Anisia dampfi (Aldrich), Neotropical – *Schistocerca cancellata* (Serville) (= *Schistocerca paranensis* (Burmeister)) (Orthoptera, Acrididae) (Greathead 1963, as *Schistocercophaga dampfi*; Arnaud 1978, as *Oedematocera dampfi*).

Anisia flaveola (Coquillett), Nearctic – *Ceuthophilus latibuli* Scudder (Orthoptera, Rhaphidophoridae) (Arnaud 1978, as *Oedematocera flaveola*).

Anisia gilvipes (Coquillett), Nearctic – "cricket" (Orthoptera, Gryllidae) (Arnaud 1978, as *Gilvella gilvipes*).

Anisia optata (Reinhard), Nearctic – *Parcoblatta* sp(p). and possibly *Ischnoptera deropeltiformis* (Brunner) (Blattaria, Blattellidae), **new record**.

Anisia serotina (Reinhard), Nearctic – *Romalea microptera* Beauvois (Orthoptera, Acrididae) (Lamb et al. 1999).

Anisia sp., Neotropical – *Schistocerca americana* (Drury) (Orthoptera, Acrididae) (Guimarães 1977, as *Oedematocera* sp.)

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