

The myrmecomorphous encyrtid *Aeptencyrtus bruchi* in the island of Kauai, Hawaii (Hymenoptera: Encyrtidae)

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Aeptencyrtus bruchi is recorded from Hawaii. Some aspects of myrmecomorphy in the family Encyrtidae are discussed.

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The genus *Aeptencyrtus* with the type species *Pheidoloxenus bruchi* De Santis, 1957 was described by De Santis (1964) from Argentina. It was included by Trjapitzin (1973) in the tribe Acroaspidiini established by him. Now 3 genera are recognized in this tribe: *Holcencyrtus* Ashmead, 1900, *Aeptencyrtus* De Santis, 1964, and *Pelmatencyrtus* De Santis, 1964 (Noyes & Woolley, 1994). The distribution of these genera is restricted by the New World. 9 species were described in the genus *Holcencyrtus*, 8 of them have been keyed by Trjapitzin (1998). The genera *Aeptencyrtus* and *Pelmatencyrtus* are monotypic. *Aeptencyrtus* differs from the other two genera of the tribe in the highly concave and mirror-shiny scutellum of female.

In addition to Argentina, *Aeptencyrtus bruchi* (De Santis) was recorded from Peru (Kerrich, 1978), Trinidad and the Antillean island St. Vincent (Noyes, 1980), and recently also from Florida (Noyes et al., 1997). I.M. Kerzhner collected 2 ♀ of *A. bruchi* in Cuba. Hosts of *A. bruchi* are known only in Peru, where it was reared from the mealybugs *Antonina ?graminis* (Maskell) and *Saccharicoccus sacchari* (Cockerell) (Homoptera: Pseudococcidae). Both coccids are well known pests: the former on different grasses and the latter on sugarcane. They are present also in the Hawaiian Islands.

In 1997, I visited the Department of Entomology, University of California, Riverside, USA and met there Prof. I.W. Beardsley. He gave me for judgement 1 ♀ of *Aeptencyrtus* collected in the island of Kauai (Hawaii) which was tentatively identified by him as a

species new to science. I compared this specimen with the material of *A. bruchi* in the collection of Zoological Institute, Russian Academy of Sciences, St.Petersburg. The females of *A. bruchi* from Trinidad and St. Vincent preserved in this collection were identified by Dr. J.S. Noyes (Museum of Natural History, London).

The Caribbean and Kauai specimens of *A. bruchi* differ from the type series of this species from Argentina (De Santis, 1957, 1964) mainly in the colour of the antennal funicle of female. It was described by De Santis as light yellow-brown, but it is black in the specimens from Trinidad, St. Vincent, Cuba and Kauai. I regard this difference in coloration of the funicle as insignificant and agree with Noyes who treated it as variability. This point of view is confirmed by the data of Kerrich who redescribed *A. bruchi* using the material from Peru and Argentina (1 ♀ not belonging to the type series). Kerrich stated that the funicular segments 1-5 of *A. bruchi* are dull brown and the 6th segment merging in colour to the club which is bronze-black. So, the coloration of the female funicle of *A. bruchi* described by Kerrich is of an intermediate type. The scape length/width ratio in *A. bruchi* female is about 3. The ratio indicated by De Santis (1964: 122) as 0.140/0.074 (i. e. about 2) is most probably incorrect, as well as that in his drawing (Fig. 43), about 4. Taking into account these considerations, I identify the Kauai female as belonging to the species *A. bruchi*.

Most probably, *A. bruchi* penetrated into Hawaii by ecesis, i.e. with its hosts. It must be emphasized that among 107 species of Encyrtidae recorded from Hawaiian Islands 59 (55%) are adventive (ecesis), 20 (19%) purposely introduced and only 28 (26%) indigenous (Beardsley, 1994).

Material examined. **Cuba** (new record): 2 ♀, prov. La Habana, Guanabo, 22.XI.1986 (I.M. Kerzhner); **St. Vincent**: 1 ♀, St. George, Kingstown, Botanic Gardens, 13.VII.1976 (J.S. Noyes) (det. J.S. Noyes); **Trinidad**: 2 ♀, Curepe, Santa Margarita, Circ. Road, 9-23.VI.1974 (det. J.S. Noyes); 1 ♀, St. David, Toho, wasteground, 28.VI.1976 (J.S. Noyes) (det. J.S. Noyes); **Hawaii** (new record): 1 ♀, Kauai Island, Moloaa, Casuarina belt above seacliff, sweeping low vegetation, 3.V.1995, (J.W.Beardsley).

On myrmecomorphy of some Encyrtidae

A recent review on the phenomenon of myrmecomorphy of insects was published by Mc Yver & Stonedahl (1993). Among encyrtids, they indicated the genus *Encyrtus* Latreille as displaying myrmecomorphy (structural modification and behavioural resemblance). Indeed, some species of *Encyrtus* resemble ants in body shape and behaviour. The first entomologist who published results of his observations in this respect was Smith (1942). He studied ethology of *E. infelix* (Embleton), a parasitoid of *Saissetia coffeae* (Walker) (Homoptera: Coccidae) on coffee plants in Puerto Rico, and that of ants *Crematogaster* sp. visiting the coccid for honeydew. Smith emphasized the close superficial resemblance of *E. infelix* and these ants. The females of *E. infelix* while apparently preparing to oviposit into the coccid would often stroke it with antennae, thus causing the scale-insect to void honeydew, acting as food competitor in respect of ants. But the ants exerted little if any effect in reducing parasitization of *S. coffeae* by *E. infelix*. "The wasps were on the plant hour after hour, and day after day, parasitizing the scales as they chose, unmolested by the ants" (Smith, 1942). In the Russian literature, the myrmecomorphy of *E. aurantii* (Geoffroy) was stressed by Rubtzov (1953, as *Eucomys lecaniorum* Mayr) who treated it as mimicry. Rubtzov supposed that the compact tuft of long hairs on scutellum of *E. aurantii* imitates the "scale" (a process of the abdominal petiole) of the ant *Lasius brunneus* Latreille. Trjapitzin (1977) separated among Encyrtidae the myrmecomorph habitus characteristic of the tribe Acroaspidiini, as well as of the genera *Encyrtus* (tribe Encyr-

tini), *Cheiloneurus* Westwood and *Diversinervus* Silvestri (tribe Cheiloneurini) and asserted its convergent origin in non-related tribes of the family. Trjapitzin & Trjapitzin (1995) indicated the adaptive character of this type of body habitus. According to my own observation of living *E. aurantii* females in Azerbaidzhan, they hold wings so close to body that look wingless, thus resembling ants; and only when they were killed by ethyl acetate, their wings became perceptible. Recently, a very interesting study on behaviour of *Encyrtus* sp., a parasitoid of *Coccus formicarii* Green (Homoptera: Coccidae) in nests of the ant *Crematogaster dohrni* Mayr, was undertaken in Vietnam by Sugonjaev (1995): a female of *Encyrtus* sp. met on twig of a tree an ant, and both insects left each other peacefully after beating reciprocally with antennae. Sugonjaev calls the myrmecomorph habitus of *Encyrtus* as myrmecoid and later (1998: 44-45) gives its definition: "Parasitoid resembles superficially a small ant. Larger species (1.5-2.6 mm) have elongated body and shortened wings closely folded on gaster. Apex of scutellum with the tuft of erect hairs resembles the "scale" of ants. Parasitoids do not avoid ants and penetrate without any problems into their nests". Among such species Sugonjaev cites *E. aurantii* (as *E. lecaniorum*).

In the tribe Acroaspidiini, only females are myrmecomorphous, with rudimentary wings and a well developed abdominal petiole. The latter character is unique among Encyrtidae, this is a synapomorphy indicating the monophyly of the tribe. It was supposed that the presence of petiole in Acroaspidiini might be associated with myrmecophily (Gordh & Trjapitzin, 1980; Trjapitzin & Trjapitzin, 1995), but it is not certain. However, 2 species of Acroaspidiini, *Holcencyrtus wheeleri* (Ashmead) (Wheeler, 1907, as *Pheidoloxenus*) and *H. scapus* Gordh & Trjapitzin (Mann, 1914, as *Ph. wheeleri*) have been found in nest of ants.

Many aspects of myrmecomorphy and myrmecophily of Encyrtidae remain now enigmatic. These problems are being studied now very successfully by Prof. E.S. Sugonjaev (Zoological Institute, Russian Academy of Sciences, St.Petersburg).

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