

## NOTA CIENTÍFICA

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**Parasitoid wasps (Hymenoptera) from puparia of sarcosaprophagous flies (Diptera: Calliphoridae; Sarcophagidae) in Buenos Aires, Argentina**

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**Avispas parasitoides (Hymenoptera) a partir de puparios de moscas sarcosaprófagas (Diptera: Calliphoridae; Sarcophagidae) en Buenos Aires, Argentina**

■ **RESUMEN.** Se registró la emergencia de parasitoides (Hymenoptera) de crías experimentales de Diptera sarcosaprófagas (Calliphoridae, Sarcophagidae), atraídas a cebos de carne bovina, en Buenos Aires (Argentina) durante 1998-2003. Se determinaron cuatro taxones: *Tachinaephagus zealandicus* Ashmead (Encyrtidae), *Brachymeria podagrica* (Fabricius) (Chalcididae), *Nasonia vitripennis* (Walker) (Pteromalidae) y *Alysia* sp. (Braconidae: Alysiinae). Sólo las dos primeras especies resultaron abundantes en todos los años. Se ha graficado el número total de emergencias de cada especie para cada mes, junto con las temperaturas promedio máxima y mínima.

**PALABRAS CLAVE.** Moscas sarcosaprófagas. Calliphoridae. *Tachinaephagus zealandicus*. *Brachymeria podagrica*.

■ **ABSTRACT.** Emergence of parasitoid Hymenoptera from experimental rearings of sarcosaprophagous Diptera (Calliphoridae, Sarcophagidae) attracted to beef baits were recorded in Buenos Aires (Argentina) from 1998 to 2003. Four taxa were identified: *Tachinaephagus zealandicus* Ashmead (Encyrtidae), *Brachymeria podagrica* (Fabricius) (Chalcididae), *Nasonia vitripennis* (Walker) (Pteromalidae) and *Alysia* sp. (Braconidae: Alysiinae). Only the first two species were abundant in all years. The number of added monthly emergences of each species is presented and correlated with monthly mean maximum-minimum temperatures.

**KEY WORDS.** Sarcosaprophagous blowflies. Wild population of Calliphoridae. *Tachinaephagus zealandicus*. *Brachymeria podagrica*.

The degree of susceptibility of Diptera to parasitoid attack appears to be species-specific. Lindquist (1940) found the Braconidae *Alysia ridibunda* Say said to be

easy to rear from species of *Lucilia* Robineau-Desvoidy (Calliphoridae) and *Sarcophaga* Meigen (Sarcophagidae), but it would not complete its cycle on *Cochliomyia macellaria*

(F.). Almeida *et al.* (2002), working in Brazil, studied the influence of temperature on the parasitoids. No such studies have been done in Argentina, although a first attempt to collate emergences of parasitoid Hymenoptera with those of the scavenger *Puliciphora rufipes* Silva Figueroa (Diptera: Phoridae) was made by Oliva (2004). Sarcosaprophagous flies are actual or potential environmental hazards (Kyei-Poku *et al.*, 2006), for they feed and oviposit on decaying animal substances, and therefore, they are potential carriers of pathogenic bacteria (Maldonado & Centeno, 2003). Parasitoid wasps have long been used to control fly populations (Lindquist, 1940). The purpose of this study is to make a list of parasitoid wasps occurring naturally on blowfly populations in Buenos Aires and to establish their seasonal occurrence.

The material for this work came from beef baits set out to attract sarcosaprophagous insects, at one site in Buenos Aires city, Argentina (34° 36' S), from 1998 to 2003. Buenos Aires has a warm-temperate climate with four seasons, which is remarkable for the short-term changes of atmospheric pressure and of wind direction (Knoche & Borzakov, 1946). Cubes of lean beef about 50 mm to each side were placed in glass jars, which in their turn were placed inside vessels with water to deter ants from attacking the beef or the developing larvae. The samples were set out in a back garden, in a brick niche which protected the jars from the rain without shading them to the point of excluding heliophilic flies. The samples were checked daily and exhaustive notes on the appearance of the bait, the presence of insects, actual ovipositings and the emergence of larvae were taken. After emergence of adult Diptera, the unopened puparia were left for one month in the summer and up to two months in the winter to observe possible emergence of parasitoids. The most numerous of these were Hymenoptera. Samples of the latter were taken and preserved in 75% ethanol. This material is deposited in the collection of the Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina. A total of 242 samples was set out in the study period, of which 153 produced parasitoid

Hymenoptera. Some samples produced more than one species. Temperatures were taken from Servicio Meteorológico Nacional of Argentina, at [www.worldweather.org](http://www.worldweather.org).

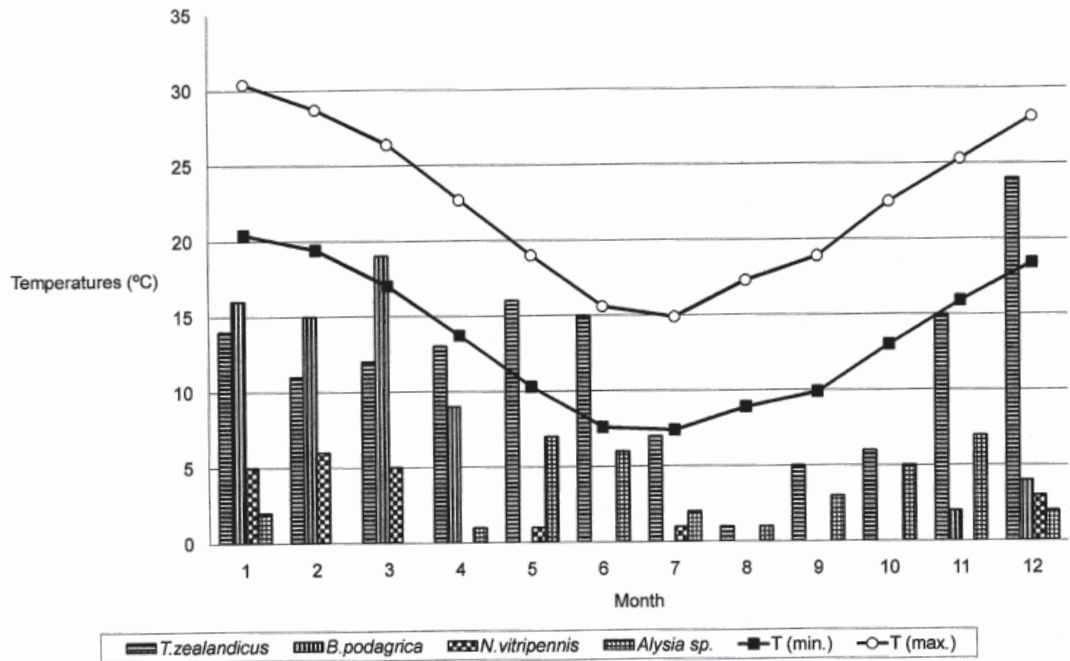
Four species of parasitoid Hymenoptera were collected during the study (Fig. 1): *Tachinaephagus zealandicus* Ashmead (Encyrtidae), *Brachymeria podagrica* (F.) (Chalcididae), *Nasonia vitripennis* (Walker) (Pteromalidae) and *Alysia* sp. (Braconidae: Alysiniinae). The most abundant species was *T. zealandicus*; the second was *B. podagrica*. Both species emerged in every year of the studied period and showed little yearly fluctuation. The least frequent species, *Nasonia vitripennis* was absent in the years 1998 and 1999. The three species identified are gregarious parasitoids (Almeida *et al.*, 2002; Marchiori, 2004). As to *Alysia* sp., it emerged in small numbers, sometimes only one individual per sample.

In the year 1998, 21% of the samples produced parasitoids; in 1999, 31.5%; in 2000, 32%; in 2001, 36%; in 2002, 39%, and in 2003, 36.5%.

Regarding host species, most parasitoid emergences came from masses of puparia which had produced both *Phaenicia sericata* Meigen (Calliphoridae) and *Sarcophaga* spp (Sarcophagidae). Emerged adults of *Sarcophaga* spp. were identified as *S. crassipalpis* Macquart and (in smaller numbers) *S. argyrostoma* (Robineau-Desvoidy). Emergences from the cooler months were associated with *Calliphora vicina* Robineau-Desvoidy (Calliphoridae). In Brazil, *Brachymeria podagrica* has been found as a parasitoid of *Chrysomya albiceps* (Wiedemann) (Marchiori *et al.*, 2002) and of *C. megacephala* (F.), in the latter case together with *Nasonia vitripennis* (Marchiori, 2004).

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**Fig. 1.** Monthly emergences of *Tachinaephagus zealandicus*, *Brachymeria podagrica*, *Nasonia vitripennis* and *Alysia* sp. from 1998 to 2003.

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