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Nota de pesquisa / Research note

FIRST RECORD OF *Aedes aegypti* (L.) (DIPTERA: CULICIDAE) INFECTED BY THE PARASITE *Ascogregarina culicis* (ROSS) (APICOMPLEXA: LECUDINIDAE) IN ARGENTINA

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Abstract

In a survey for parasites and pathogens of *Aedes aegypti* conducted in La Plata, Argentina, an aseptate gregarine was found parasitizing larvae, pupae and adults of this mosquito species. This gregarine species was identified as *Ascogregarina culicis* based on the morphology and size of gamonts, gametocysts and oocysts. It is the first record of gregarine infections in culicids from Argentina.

Key words: Gregarine, *Ascogregarina culicis*, *Aedes aegypti*

Dengue and dengue hemorrhagic fever occur throughout the tropical and semitropical regions of the world (Gubler & Kuno, 1997) and is the most important and rapidly spreading arbovirus infection in the Americas.

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Aedes aegypti (L.) is the primary vector of dengue in the Americas. Reinfestation of Argentina by *A. aegypti* was recorded since 1986 (PAHO, 1990) meanwhile classic dengue cases has been reported in the north and northeast provinces since 1998 (Avilés *et al*., 1999). The range of this mosquito species has been spreading in Argentina over the last fifteen years and its presence has been recorded in fifteen argentine provinces and in Buenos Aires city (Curto *et al*., 2002).

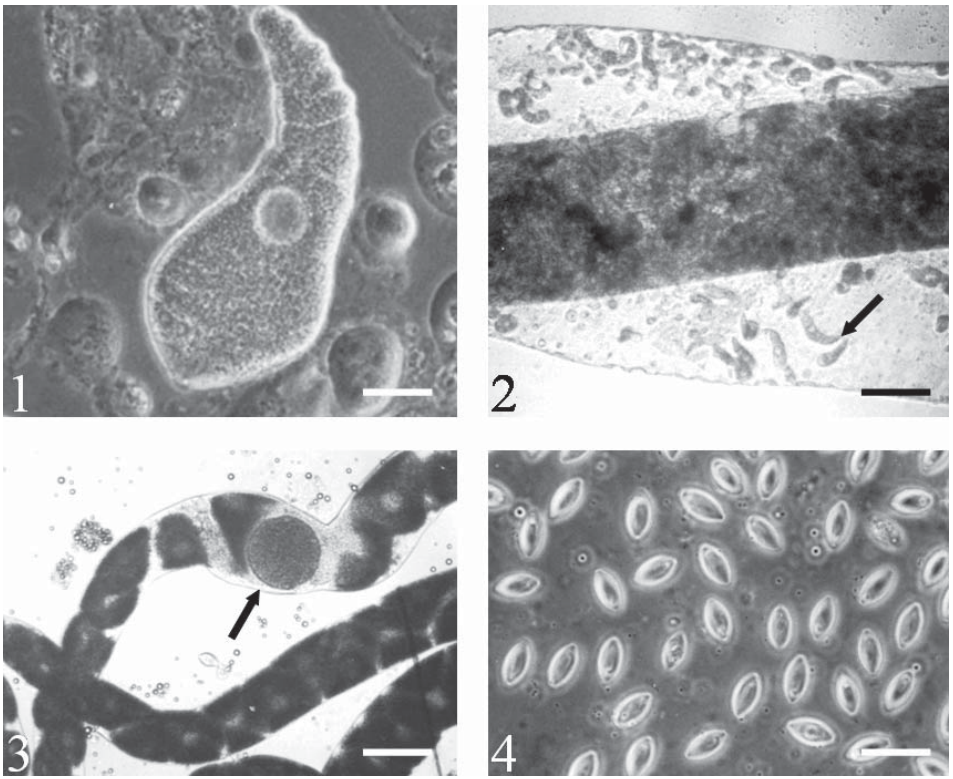
Control of *A. aegypti* is based on chemical treatment and environmental management. These methods have shown variable success and some potentially have negative environmental effects. The use of biological control against *A. aegypti* is an alternative control measure that should be considered although studies concerning natural predators, parasites and patogens of *A. aegypti* are rare in Latin America including Argentina.

During a survey for natural enemies of *A. aegypti* from October 2003 to June 2004 in La Plata, Buenos Aires province, Argentina, was found an aseptate gregarine parasitizing larvae, pupae and adults of field collected *A. aegypti* with prevalence rates ranged from 24% to 31%.

Infected larvae presented free elongate gamonts in the midgut, measuring 59.3 ìm (30.8-168.3) long and 12.1 ìm (7.1-26.7) wide (n=100; fresh) (Figs. 1, 2). Spherical gametocysts with 2 gamonts at first, later filled with large number of oocysts were recorded in the lumen of Malpighian tubes of pupae and 24 old emerged male and female adults, averaged 98.3 ìm (78.6-129.7) in diameter (n=25; fresh) (Fig. 3). Mature oocysts elongate ellipsoidal had 11.2 ìm (9.5-12.2) long and 4.9 ìm (4.7-5.1) wide (n=100) (Fig. 4).

We believe that the gregarine reported is the same species described in detail by Lien & Levine (1980) from *A. aegypti* in Taiwan, and identified as *Ascogregarina culicis* (Ross). However, the adult gamont sizes vary considerably in previous reports. Ross (1895) recorded gamonts up to 200 µm. Wenyon (1911) gave an average of 50 µm in long for gamonts of this species. McCray *et al*. (1970) mentioned a length of 275-280 µm for mature gamont of *A. culicis*. Despite these variations in the size of adult gamonts, mature oocyst dimension in these reports has remained consistently in the range 9-10 x 5-6 µm which is fairly close to the argentine isolate reported here.

Ascogregarina culicis was first described from *A*. *aegypti* in India by Ross (1895). Subsequently, the parasite has been widely reported from this host in Africa, Asia, Europe, North America and South America (Jenkins,



Developmental stages of *Ascogregarina culicis* in *Aedes aegypti*. Fig. 1: mature gamont (bar = 8 µm); Fig. 2: Free gamonts (arrow) in larval midgut (bar = 90 µm); Fig. 3: gametocyst (arrow) in Malpighian tubes of adult (bar = 90 µm); Fig. 4: mature oocysts freed from broken Malpighian tubes of adult. (bar = 14 µm).

1964; Robert & Strand, 1977). The only previous record of *A. culicis* from South America was reported by Marchoux *et al*. (1903) in *A. aegypti* in Brazil. After a century, this is the second report of the occurrence of *A. culicis* in the Neotropical region and it is the first record of a gregarine infection in mosquitoes from Argentina.

Previous studies have indicated that *A. culicis* has some potential as a biological control agent for *A. aegypti* (Sulaiman, 1992). The natural role of *A. culicis* in the population dynamics of *A. aegypti*, and the potential of this gregarine to serve as biological control agents for *A. aegypti* remain to be explored.

References

Avilés, G.; Rangeón G.; Vorndam V.; Briones A.; Baroni P.; Enria D. & Sabattini M.S., 1999. Dengue reemergence in Argentina. **Emerg. Infect. Dis. 5**: 575-578.

Curto, S.I.; Boffi, R.; Carbajo, A.E.; Plastina, R. & Schweigmann, N., 2002. Reinfestación del territorio argentino por *Aedes aegypti*. Distribución geográfica (1994 - 1999). Publ. Monogr. 2:127-137 *In*: **Actualizaciones en artropodología sanitaria argentina. Ser. Enfermedades transmisibles. RAVE**, (O.D. Salomón, ed.). Fundación Mundo Sano, Buenos Aires, 301 p

Gubler, D. & Kuno, G., 1997. **Dengue and dengue hemorrhagic fever**. CAB International, New York, 496 p.

Jenkins, D.W., 1964. **Pathogens, parasites and predators of medically important arthropods. Annotated list and bibliography**. Bull.WHO *30* Supplement, 150 p.

Lien, S. & Levine, N.D., 1980. Three new species of *Ascocystis* (Apicomplexa, Lecudinidae) from Mosquitoes. **J. Protozool. 27**:147-151.

McCray, E.M. Jr.; Fay, R.W. & Schoof, H.F., 1970. The bionomics of *Lankesteria culicis* and *Aedes aegypti*. **J. Invertebr. Pathol. 16**:12-53.

Marchoux, E.; Salimbeni, A. & Simond, P. L., 1903. La fievre jaune. Rapport de lamission francaise. **Ann. Inst. Past. 17**:665-673.

PAHO, 1990. Health conditions in the Americas. **Sci. Pub. 524**:7-25.

Robert, D.W. & Strand, M.A., 1977. **Pathogens of medically important arthropods. Bibliography**. Geneva: World Health Organization, 419 p.

Ross, R., 1895. The crescent-sphere-flagella metamorphosis of the malaria parasite in the mosquito. **Trans.South Indian Branch, 6**: 334-350.

Sulaiman, I., 1992. Infectivity and pathogenicity of *Ascogregarina culicis* (Eugregarinida: Lecudinidae) to *Aedes aegypti* (Diptera: Culicidae). **J. Med. Entomol. 29**:1-4.

Wenyon, C.M., 1911. The life story of *Lankesteria culicis* (Ross, 1898). Gregarine in *Stegomyia fasciata*. **Parasitology 4**:318-324.