

## PRESENCE OF *TUNGA TRIMAMILLATA* (INSECTA, SIPHONAPTERA) IN PERU

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Sir,

Since 2002, when, for the first time, Pampiglione *et al.* described *Tunga trimamillata* as a new sand flea species from Ecuador, several studies have permitted us to better define its morphology, its distribution in the Andean regions of this country and its main hosts in cattle, goats and swine (Pampiglione *et al.*, 2003, 2004). Furthermore, this species has been recognized as the second zoonotic *Tunga* species, after *T. penetrans* (Fioravanti *et al.*, 2003).

This surprising finding, at the beginning of the XXI<sup>th</sup> century, of a never before described species with such a huge diffusion among ruminants and pigs in the Ecuadorian south-central provinces, induced us to investigate its possible presence in other Latin American countries. A survey was carried out last summer in the Piura region of northern Peru, sampling gravid females of *Tunga* taken from animals at some slaughterhouses or breeding places and collecting free specimens from the ground where animals had been raised.

371 sand fleas were extracted from cattle, sheep and goats with a prevalent localization along the hoof pad or infixed in the proximal edge of the hoof, and 14 free subjects were collected from pastures.

All the parasites were fixed in 70 % ethanol; the gravid females were directly examined with a stereoscopic dissecting microscope, while the specimens collected on the ground were clarified in Hoyer's medium and examined with a light microscope. All the gravid females taken from animals were identified as *T. trimamillata*. *T. penetrans* was not found in any of the animals. Among the males and females collected from the ground in the pasture, both *T. trimamillata* and *T. penetrans* were identified. The analysis of the rate either between the two species, *T. trimamillata*/*T. penetrans*, and males/females is under study.

The presence of infection due to *T. trimamillata* was detected in all the localities taken into consideration, from 29 and 399 meters above sea level (Piura and Suyo respectively) up to 2,709 m.a.s.l. (Ayabaca).

The results of this survey show the relevant role of ruminants as common hosts of *T. trimamillata* and



Fig. 1. – *T. trimamillata* extracted from the hoof of a sheep.

confirm the sheep as a suitable host for this species (Fig. 1), thus extending its geographic diffusion to the northern districts of Peru.

In relation to the pathogenic role demonstrated for *T. trimamillata* in man and animals, further studies are necessary to define the epidemiology of this species and state its importance as a causal agent of human tungiasis in the rural areas where people in Latin America live at a low socioeconomic level.

It is interesting to point out how, in the Andean regions, in which we found a notable diffusion of *T. trimamillata* in ruminants, the local inhabitants commonly differentiate between the two different types of tungiasis which were found in man: one which is less annoying caused by small sand fleas characteristic of swine ("niguas de cerro" or "swine sand fleas" corresponding to *T. penetrans*) and one which is more painful, characteristic of larger sand fleas ("niguas de vaca" or "cattle sand fleas" corresponding to *T. trimamillata*). This fact would indicate historical knowledge on the part of the local people of the existence of *Tunga* species of different animal derivation which cause different pathologies in man.

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