

HAEMAPHYSALIS JUXTAKOCHI, IXODES PARARICINUS (IXODIDAE) AND OTOBIUS MEGNINI (ARGASIDAE) IN RELATION TO THE PHYTOGEOGRAPHY OF ARGENTINA

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SUMMARY

The phytogeographical distributions of *Haemaphysalis juxtakochi*, *Ixodes pararicinus* and *Otobius megnini* in Argentina are described from material collected mainly from 1978 to the present. *H. juxtakochi* was found in the northwestern area of the Amazonian domain and in the Chaco, Espinal and Pampean provinces of the Chaco domain. It was detected on *Mazama* spp., *Tapirus terrestris*, dog, cattle and on the vegetation. Most findings of *I. pararicinus* were from mountain rangeland, where it

was found on cattle and in a lesser extent on horses. Ticks from Argentina classified as *Ixodes ricinus* were probably *I. pararicinus*. *O. megnini* was detected on cattle and sheep in the Andean Patagonian domain and in the Monte, Chaco and Espinal provinces of the Chaco domain. This tick is considered typical of arid and semiarid conditions, however the findings from the Espinal province were from areas with an annual rainfall over 900 mm.

RÉSUMÉ : Phytogéographie et distribution de *Haemaphysalis juxtakochi*, *Ixodes pararicinus* (Ixodoidea) et *Otobius megnini* (Argasidae) en Argentine.

La distribution de *Haemaphysalis juxtakochi*, *Ixodes pararicinus* et *Otobius megnini* en Argentine a pu être établie grâce au matériel collecté de 1978 jusqu'à ce jour. *H. juxtakochi* a été trouvée dans les domaines Amazonien (région nord-ouest) et du Chaco (provinces de l'Espinal, Chaco et du Pampean) sur le chien, le bovin, *Mazama* spp. *Tapirus terrestris* et sur le couvert végétal. Par contre, *I. pararicinus* a été le plus souvent trouvé dans la prairie de montagne, sur les bovins et parfois sur le cheval. Il

est possible que les tiques de l'Argentine classées comme *Ixodes ricinus* soient *I. pararicinus*. *O. megnini* a été trouvée sur les bovins et les ovins dans les domaines Andin-Patagonien et du Chaco (provinces du Monte, du Chaco et de l'Espinal). On a toujours considéré que cette tique se développait dans les régions arides et semi-arides, cependant les précipitations annuelles de la province de l'Espinal dépassent les 900 mm.

INTRODUCTION

Five of the 155 species of the genus *Haemaphysalis* are found in America (Hoogstraal and Aeschlimann, 1982). *Haemaphysalis juxtakochi* (= *H. kochi*, *H. kohlsi*) has been detected from Mexico (Hoffman, 1962) to Argentina (Aragão, 1935). Infestation of cattle with this tick species has been found only in Argentina (Estrada Peña, 1989).

Ticks of the genus *Ixodes* are not an important problem to the cattle industry in America. Nevertheless, a dangerous species, *Ixodes ricinus*, has been reported infesting livestock from Colombia (Reyes, 1938) to Argentina (Aragão, 1938) and Chile (Donoso Barros, 1954). Boero (1957) considered that *I. ricinus aragoi* and *I. ricinus rochensis* described by Fonseca (1935) in Brazil and Calzada (1936) in Uruguay, respectively to be identical to *I. ricinus*. These diagnosis are probably erroneous. Ticks classified as *I. ricinus* in Argentina, Uruguay and probably Colombia

were in fact *Ixodes pararicinus*, a species described from adults found on cattle and occasionally horses (Keirans, Clifford, Guglielmonne and Mangold, 1985).

The only argasid tick found frequently on cattle in Argentina and other South American countries is *Otobius megnini*. The adults of this tick species are not parasitic whereas the nymph and larva feed, commonly, in the ear canal of the same individual host (one-host tick). Several cases of otitis in calves associated with the presence of *O. megnini* have been detected in Argentina (Guglielmonne, 1990).

This article describes the geographical distributions of *H. juxtakochi*, *I. pararicinus* and *O. megnini* in relation to the phytogeographical regions of the infested areas of Argentina with additional information on hosts.

MATERIALS AND METHODS

The finding sites of the three species of ticks were obtained from the Instituto Nacional de Tecnología Agropecuaria (INTA) tick collection, deposited in INTA Rafaela, which contains specimens collected mainly from cattle since 1978 to the present. Data provided by personnel of Laboratorio Regional Santa Fe from the Servicio Nacional de Sanidad Animal (SENASA) and those contained in Aragao (1935, 1938), Boreo (1944, 1945, 1955), Ivancovich (1973), Teper (1983, 1986), Keirans *et al.* (1985) and Guglielmonne and Man-

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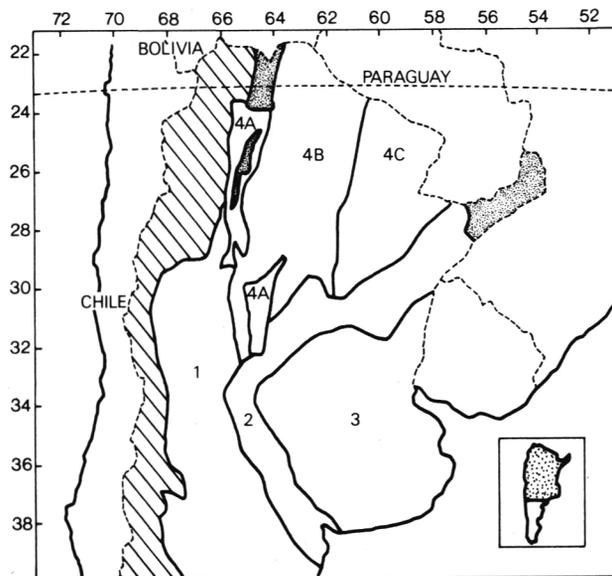


FIG. 1. — Phytogeographical division of continental Argentina north to 40°S (compiled from Ragonese, 1967; Cabrera, 1976 and Neumann unpublished).

- Andean Patagonian domain. ■ Amazonian domain.
- Chaco domain, 1 — Monte province, 2 — Espinal province, 3 — Pampean province, 4 — Chaco province, 4a — Mountain district, 4b — Western district, 4c — Eastern district.

gold (1986) were also used. The information on hosts and tick numbers of *H. juxtakochi* was obtained from the record of SENASA and the INTA tick collection, while that referred to *I. pararicinus* and *O. megnini* was from the INTA tick collection. Ticks were classified according to Boero (1957) and Keirans *et al.* (1985).

The finding sites were plotted according with the main phytogeographical regions of the continental territory of Argentina north to 40° S (Fig. 1), compiled from Ragonese (1967), Cabrera (1976) and Neumann R. A. (Departamento de Recursos Naturales, EEA INTA Salta CC 228, CP 4400 Salta, Argentina. Unpublished).

Three phytogeographic domains are represented in this region:

I — *Andean Patagonian*: it is characterized by an annual rainfall below 350 mm. Frost may occur throughout the year with snow during the winter. The dominant vegetation is formed by a steppe of scattered shrubs and grasses.

II — *Amazonian*: the climate is hot and humid. The annual rainfall range between 900 and 2,500 mm. The dominant vegetation is rainforest.

III — *Chaco*: this domain is important to the cattle industry. It is formed by four main phytogeographical province:

1 — *Monte*: the climate is hot and dry. The annual rainfall is below 200 mm. The dominant vegetation consists of xerophytic, psamphytic and halophytic bushes.

2 — *Espinal*: it is characterized by a hot and humid climate in the north and temperate and less humid elsewhere. The rainfall is concentrated in summer and bushes of *Prosopis* are abundant.

3 — *Pampean*: the climate is temperate. The rainfall ranges from 600 to 1,000 mm yearly, being more abundant in autumn and spring. The dominant vegetation is grassland at the east and steppe at the west, according with the amount of rainfall. Cattle industry is well developed.

4 — *Chaco*: the climate is hot with mainly summer rainfall. The dominant vegetation consists of deciduous xerophytic forest. This phytogeographical province contains an important number of cattle and

the greatest diversity of cattle tick species within Argentina. The Chaco province is formed by three main districts:

4a — *Mountain*: the annual rainfall ranges between 400 and 600 mm. The vegetation is largely composed by forest with predominance of *Schinopsis hankeana* and patches of hard grasses.

4b — *Western*: the annual rainfall varies between 500 and 800 mm. The main vegetation is formed by forest of *Schinopsis lorentzii* and *Aspidosperma quebracho blanco*.

4c — *Eastern*: the climate is more humid than in the other districts. The main vegetation is formed by forest of *Schinopsis balansae* and *A. quebracho blanco*.

An special mention has to be made about mountain rangeland. This is a small zone scattered along valleys and mountain slopes in northwestern Argentina between the Mountain Chaco district and the Andean Patagonian domain. The altitude ranges from 1,500 to 2,500 m. The climate is temperate and the annual rainfall is between 700 and 1,300 mm, occurring mainly in spring and summer. Ground cover vegetation consists of bunch grasses, principally *Paspalum commune* and *Botriochloa laguroides*, and patches of bush, mainly *Acacia cavens* var. *dehiscens*. Cattle breeding is only of local importance but the tick fauna is diverse.

RESULTS AND DISCUSSION

The geographical distribution of *H. juxtakochi*, *I. pararicinus* and *O. megnini* in relation to the phytogeography of Argentina is shown in Figure 2. *H. juxtakochi* was found in the northwestern area of the Amazonic domain and the northern part of the Mountain district (Chaco province of the Chaco domain); a cluster of findings was located in the south of the Eastern district (Chaco province of the Chaco domain) and its continuity into the Espinal and Pampean provinces (Chaco domain). A total of 332 *H. juxtakochi* were recorded: 196 ♀, 68 ♂, 51 nymphs (N), 17 larvae (L); 3 ♀, 13 ♂, 2 N were found on *Mazama* spp.; 5 ♀, 2 ♂ on *Tapirus terrestris*; 1 N on a dog; 1 ♂, 2 N were found on vegetation and the rest (188 ♀, 52 ♂, 46 N, 17 L) on cattle. The preferred hosts for adults *H. juxtakochi*, appear to be deers (Jones, Clifford, Keirans and Kohls, 1972); probably, cattle and other domestic animals are circumstantial hosts. Nevertheless the majority of the findings from this study were from cattle; this is likely the result of cattle being sampled for ticks more often than other hosts. This tick species resembles macroscopically to *Boophilus microplus* which is under an official eradication programme. There is a risk to keep under quarantine farms infested with *H. juxtakochi* instead of *B. microplus* unless a proper diagnosis is made (Boero, 1957; Teper, 1983).

Most findings of *I. pararicinus* were from the mountain grassland where low level of infestations were found on the head and neck of cattle. Findings of ticks classified as *I. ricinus* outside this area (Boero, 1944, 1945, 1955; Teper, 1983) were probably of ticks belonging to *I. pararicinus* but we did not find the ticks mentioned by these authors to clear this point. A total of 143 ticks are recorded in the INTA tick collection under this taxon; 126 ♀, 13 ♂ were found on cattle and 4 ♀ on horses. The larva and the nymph of *I. pararicinus* remain unknown.

O. megnini was detected in the Andean Patagonian and

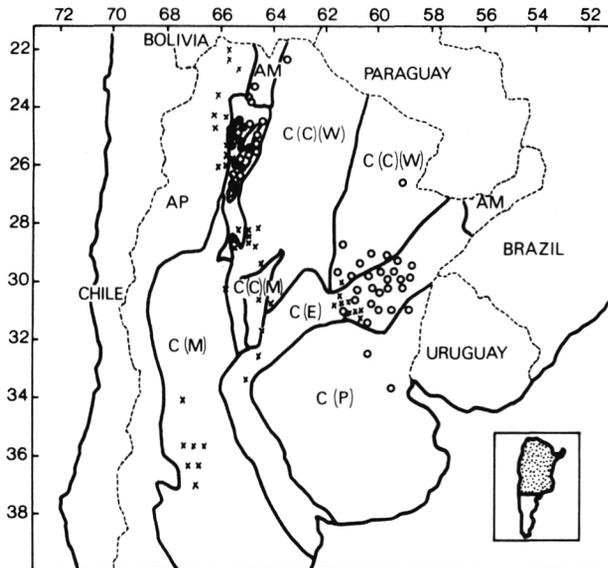


FIG. 2. — Geographical distribution of *Haemaphysalis juxtakochi* (○), *Ixodes pararicinus* (●) and *Otobius megnini* (×). AP = Andean Patagonian domain, AM = Amazonian domain, C = Chaco domain. C(n) = Monte province, C(E) = Espinal province, C(P) = Pampean province, C(C) = Chaco province, C(C)(n) = Mountain district, C(C)(W) = Western district, C(C)(E) = Eastern district.

Chaco domains; however, it was not found in the Pampean province and only one record was registered for the Eastern district of the Chaco province. The INTA tick collection has records of this argasid found on cattle (868 N, 69 L) and sheep (25 N). Nevertheless the dog, goat, horse, lama and man have been found infested with *O. megnini* in Argentina, as reviewed by Guglielmo and Mangold (1986). This tick species is considered to be adapted to arid and semiarid conditions (Boero, 1957; Hoogstraal, 1973). However its geographical distribution in South Africa seems to prove that *O. megnini* has the ability to survive in areas with a more humid climate (Theiler and Salisbury, 1958). This is confirmed with the findings in the Espinal province (Chaco domain) in Argentina (Fig. 2) where the annual rainfall is over 900 mm. The first communication of a finding of *O. megnini* in this area was made by Lombardero and Peretti (1973). It is not known if this tick is part of the ecosystem since long time ago or it has been introduced recently. Evidences from other areas of Argentina (Medrano and Suárez, 1983) and Canada (Gregson, 1953) showed that first reports of *O. megnini* described what was already known for many years by local people. This may be a consequence to attach in the ear canal where low level of infestation are difficult to detect.

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