Seropositivity to *Leptospira interrogans* in a herd of vicuñas (*Vicugna vicugna*) under captivity in northern Chile

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ABSTRACT. Twenty-one vicuñas (*Vicugna vicugna*) from a Chilean breeding unit were tested to serovars Pomona, Canicola, Copenhageni, Ballum and Grippotyphosa of *Leptospira interrogans* using the microscopic microagglutination technique. The results showed that 23.8% of the samples reacted to the serovar Grippotyphosa which has been related to abortions in South American camelids. Key words: leptospirosis, camelidae, *Vicugna vicugna*.

The study was carried out in the Vicuña Breeding Unit of Limani (18° 23’S, 69° 34’ W; 4,385 m.a.s.l.) located in the Arica and Parinacota Region, Chile. The sampling was authorised by the Agriculture and Livestock Service of Chile (SAG). The unit has 49 vicuñas (13 males, 21 females, and 15 young vicuñas under one year of age) in a 40 Ha of bofedal. A temporary capture of 21 pregnant and non-pregnant adults from 2 to 6 years old, was carried out. Each female was tied up in sternal decubitus position without sedation, and 4 ml of blood was obtained by jugular puncture using a syringe and then collected in heparine tubes. The samples were centrifuged at 1,500 rpm for 15 min, and plasma was transported to Universidad Católica de Temuco by air, and stored at –80 °C until analysis.

The antibody reaction against the serovars Pomona, Canicola, Copenhageni, Ballum, and Grippotyphosa of *Leptospira interrogans* was determined using the microscopic microagglutination technique, in the laboratory of Veterinary Microbiology, Universidad de Concepción. The antigenic strains and positive controls were provided by SAG. Plasma samples were examined at dilutions of 1:100, 1:200, 1:400, 1:600, 1:1,800 and incubated with the antigen at 37 °C during 2 hours. Sera with ≥ 50% agglutination or more was considered positive, with titers equal to or greater than the 1:100 dilution.

Five (23.8%) out of 21 vicuñas analysed were reacted positively to the serovar Grippotyphosa of *L. interrogans* with a titer (1:100) that ruled out active infection. The results of previous studies of seropositivity to *L. interrogans* in vicuñas are diverse. In Argentina, between 7% and 62% out of 73 vicuñas from wild and captive herds, reacted to the serovars Copenhageni and Castelloni, and the study did not include the serovar Grippotyphosa (Llorente et al 2002). In Peru, 77.4% out of 195 vicuñas from wild and captive herds were positive to the serovars Icterohaemorrhagiae and Pomona in the Huancavelica and Ayacucho Region (Rosadio et al 2015). On the other hand, in south Puno, only 1.9% (4/207) of the vicuñas were positive to the serovars Pomona, Autumnalis, Bratislava, and Copenhageni, including Grippotyphosa (Risco-Castillo et al 2014) screened against 17 serovars.

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1 Shaw et al 2012, CONAF, pers. commun.
The seropositivity of the serovars Pomona (33%), Hardjo (14%), Copenhageni (11%), and Grippotyphosa (8%) has been registered in clinically healthy vicuñas of the captivity Breeding Unit of Cculicculine, Chile. The Units of Ankara and Limani were negative, although the sample size of the latter Unit was small (8 animals) (SAG 2002, Perez et al 2007). Based on the results of the present study, it is possible that leptospirosis could potentially affect the fertility of vicuñas in the Chilean highlands considering that serovars Pomona and Grippotyphosa were associated with episodes of abortions in North American camelids (Lohr et al 2007, Fowler 2010). However, the finding of serological reactivity is not enough to state that infertility of the herd can be attributed to pathogenic \textit{Leptospira} \textit{sp} infection. It is recommended to study the prevalence of this disease in wild herds and epidemiological surveillance of the captive systems to prevent the spread of this disease. The identification of the wild species that could act as a reservoir of the causative serovars for humans and domestic species would also be helpful to have an action plan for the control of the disease. In conclusion, 23.8% (5/21) of the vicuñas under captivity in Limani were positive to the serovar Grippotyphosa of \textit{Leptospira} \textit{interrogans}.

REFERENCES


