SPATIAL AND TIME EXPLORATIVE ANALYSES ON 15 YEARS OF PASSIVE SURVEILLANCE AND SEROLOGICAL MONITORING FOR SCABIES IN THE ALPINE CHAMOIS POPULATION OF THE BELLUNO PROVINCE (ITALY)

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Sarcoptic mange is one of the most severe diseases of wild Caprinae populations in Europe, raising concern about wildlife management and conservation. Since 1995, an epidemic of sarcoptic mange has been affecting the chamois (*Rupicapra r. rupicapra*) population of the dolomitic area, in the North Eastern Italian Alps, involving also the sympatric ibex (*Capra ibex*) populations. The index case was found in the province of Belluno, where the disease is still spreading and where are now present different epidemiological situations: free areas, epidemic areas, endemic areas with sporadic cases, and an endemic area showing a second clinical peak about 15 years from the index case. In the past years, different approaches have been attempted to control scabies and to better understand the dynamics of this disease. Among these, ELISA serological methods have been applied on chamois shot during the regular hunting seasons, mainly in free areas, as an attempt to anticipate the arrival of the clinical disease. Notwithstanding, these attempts showed contradictory results, due to the difficulties in both interpreting serological evidences and defining an epidemic front to compare with.

Starting from raw data of 1168 scabies-affected chamois carcases found from 1995 to 2010, and 2735 shot chamois tested for antibodies to *Sarcoptes scabiei* on lung extract from 2001 to 2009, we propose an explorative approach in the Belluno province. This approach, implemented by time series analysis and a geographic information system (GIS), explores the scabies epidemic in chamois, its front and the seropositivity distribution in space and time using, instead of index cases, the centroid of the mountain massifs during their own epidemic peaks and/or the coordinate mean of clinical mange cases in each year as epidemiological units and geographical benchmarks.

Regarding clinical cases, time series analysis confirmed previous studies, showing the main incidence of the disease during late winter/early spring. The scabies front appears to spread in a south-westward direction with a mean estimated speed of 5±3.7 km/year, which is comparable with the results of previous studies in the same area. Considering the serological results in comparison to scabies cases, an interesting and quite regular pattern was observed, as the earliest serological positive case in different massifs anticipates the earliest clinical cases of 5-6 years. The average distance between the epidemic front and first serological positivity is more than 25 km. These results were unexpected, and should be confirmed by further analyses to be performed in neighbouring areas, namely Trento and Bolzano provinces. If these result will be confirmed, they would represent a significant step in the knowledge of *S. scabiei* ecology and potential impact in the alpine chamois populations.

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