

***Echinococcus granulosus* in the Lombardy region**

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Cystic echinococcosis (*Echinococcus granulosus*) is a significant public health problem in the Mediterranean basin. In Italy, there are few epidemiological studies on echinococcosis in animals and humans mainly on southern regions, even if echinococcosis is included in the list of zoonoses that need an epidemiological surveillance (2003/99/EEC of 17 November 2003). A survey on the prevalence of infestation in slaughtered animals had shown a decreasing infection rate from south to north (Lorenzini R, Ruggieri A, 1987, J Helminthol, 61: 261-267). The Lombardy region (northern Italy) is considered a low endemic area for *E. granulosus* (Fattori D *et al*, 2000, L'osservatorio, www.oevr.org). Samples from definitive and intermediate hosts were collected in order to up-to-date the prevalence of echinococcosis in this region. Faecal samples from sheepdogs (N = 44) and wolves (N = 15) were collected and analysed by the CA-ELISAs commercial test kit (CHEKIT-Echinotest, Bommeli Diagnostic, Switzerland) and/or flotation technique. Wolf faecal samples were collected from the ground of an area where this carnivore had been signalled. CA-ELISA-positive samples were confirmed by a PCR analysis of mitochondrial DNA (12S) and sequencing according to a previous published protocol (Stefanic S *et al*, 2004, Parasitol Res, 92: 347-351). To identify the *E. granulosus* genotype, the mitochondrial DNA (12S) was amplified according to a previous published protocol (Dinkel A *et al*, 2004, Int J Parasitol, 34: 645-653), then NADH and CO1 mitochondrial genes were sequenced (Bowles J, McManus DP, 1993, Int J Parasitol, 23: 969-972; 1993, Acta Trop, 53: 291-305).

A total of 822 sheep (443 adults) and 121 goats (92 adults) originating from Milano, Lecco, Varese, Como, Bergamo and Brescia provinces, were examined; furthermore, about 3×10^5 cattle slaughtered at the abattoir of Lodi (INALCA) within the year 2004, were tested for hydatid cysts. Farms breeding positive cattle were identified and analysed by a GIS software (Arcview 3.2, ESRI).

Faecal samples from 12 dogs (27.3%) and 11 wolves (100%) resulted positives by CA-ELISA, of them, seven dog samples harboured taenid eggs and one dog sample was infected by *Sarcocystis* sp. PCR confirmed the presence of *E. granulosus* in only one dog. Hydatid cysts were detected in three adult sheep (0.36%) and in 323 (0.1%) dairy cattle from 252 farms. Infected cattle are distributed in farms from nine provinces, mostly belonged to intensively managed dairy cattle and they were all adults. Of them, 140 (43.3%) originated from farms located in the Milano, Lodi, Cremona and Mantova provinces, where they are housed in and enter an outdoor paddock. The cysts from sheep were identified as belonging to the G1 genotype (ovine strain).

The results confirm that echinococcosis is hypoendemic in Lombardy, but data collected at the slaughterhouse could underestimate the prevalence of the infection, because old sheep are not always slaughtered under veterinary control. The infection seems to be sporadic in cattle with 1-2 positive animals per farm. These farms have very large fields to produce green fodder still used as supplement to the diet of dairy cattle. The infected cattle cannot contribute to the life cycle of *E. granulosus* in the study area, because, as a general rule, G1 genotype cysts are unfertile in cattle, and animals were regularly slaughtered and their offal appropriately discharged. However, the GIS analysis has shown that the farms of infected animals were located along the routes followed by transhumant sheep herds. These results are in agreement to those reported by Fattori D *et al* (2000, L'osservatorio, www.oevr.org). We believe that sheepdogs may contaminate the fields by their faeces infected with *E. granulosus* eggs. In addition, the presence of hydatid cysts in an intensively managed cattle area is an indicator of a possible zoonotic risk for humans.

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