

Preliminary data on diffusion and molecular characterization of Cystic Echinococcosis in small ruminants in Peloponnesus, Greece

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Cystic echinococcosis (CE) caused by the metacestode of the dog worm *Echinococcus granulosus* is a zoonotic disease of worldwide importance which is widespread in the Mediterranean Region (Garippa *et al*, 2004, *Parassitologia*, 46: 387-391). Livestock raising of small ruminants occurs extensively in Greek region of Peloponnesus. Considerable informations are available about the epidemiology of different genetic strains of *E. granulosus* around the world (Thompson RC, McManus DP, 2002, *Trends Parasitol*, 18: 452-457). However no information is available about the role of different genotypes of *E. granulosus* in Greece as recent data on the diffusion of this zoonosis in the south of Greece (Seimenis A, 2003, *Acta Trop*, 85: 191-195; Sotiraki *et al*, 2003, *Acta Trop*, 85: 197-201). Here we examine CE cysts from sheep, and goats from Peloponnesus in order to determine diffusion and prevalence of this metacestode and to characterize the genetic variants of the parasite in this district. Liver, lung and spleen samples were obtained from 171 sheep and 94 goats slaughtered in various butchereries in Arcadia Region between July 2005 and February 2006. The above-mentioned organs of slaughtered livestock were examined for hydatid cysts by visual inspection and palpation. When cysts were found, they were examined in the laboratory to determine number, location, type and fertility. Then DNA was extracted from laminar layers and protoscoleces of viable cysts harboured by 30 sheep and 10 goats, using a commercial kit (Roche DNA template extraction kit). The Dinkel *et al* (2004, *Int J Parasitol*, 34: 645-653) protocol was performed on all DNA samples for a first screening of all samples in order to discriminate the most important strain clusters with four different PCR reactions. Sequencing reactions were then performed in order to confirm the strain typing on PCR products as described by Bowles J, McManus DP (1993, *Acta Trop*, 53: 291-305) for NADH and COI mitochondrial genes. Prevalence of 30% and 16% were respectively found in sheep and goats examined for hydatids (χ^2 Yates corrected = 5.52; $P = 0.018$). The cysts' fertility was of 16% in sheep and of 5% in goats ($\chi^2 = 5.32$; $P = 0.021$). 56.8% of positive sheep to the metacestodosis harbour more than 10 hydatids per animal, while this percentage (animals with more than 10 cysts) in goats was of 20% (χ^2 Yates corrected = 5.03; $P = 0.024$). Through the bio-molecular analysis was possible to isolate three different strains, according to sequences present in GenBank. G1 (Common Sheep strain) and G3 (Buffalo strain) were found respectively in 28 and 2 sheep. Seven goats were infected with the G1 strain while G7 (Pig strain) was recovered in three animals. The results shown a very interesting situation on the epidemiology point of view, where the G7 strain was found in all goats examined cysts. This confirm the deep diversity between sheep and goats also on the susceptibility to *E. granulosus* strains. On the other hand this situation seems critical for the human health, considering that were isolated the two most important strains involved in human pathology. These are the first data on genetic characterization of *E. granulosus* in Greece and open new fields for a full comprehension of the epidemiology and transmission dynamics of this zoonosis in this important country of the Mediterranean Basin.