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# Distribution of helminths in buffalo farms from central Italy

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**ABSTRACT:** The aim of the present study was to obtain up-to-date information on the distribution of helminths in buffalo farms of central Italy. The survey was carried out on a sample of 127 farms (epidemiological units), selected using a grid approach within a Geographical Information System, followed by proportional allocation. In each farm the number of buffaloes tested (adults, heifer/steers and calves) ranged from 9 to 21 based on the number of animals on the farm. The total number of faecal samples collected from the 127 farms was 1883. Copromicroscopic examinations were performed using the FLOTAC technique. The following helminths were detected in the examined farms: gastrointestinal strongyles (33.1%), *Strongyloides* spp. (3.1%), *Fasciola hepatica* (7.1%), *Dicrocoelium dendriticum* (2.4%), Paramphistomidae (7.1%), and *Moniezia* spp. (2.4%).

**Key words:** Parasites, Helminths, Geographical Information System.

**INTRODUCTION** - Information on the presence and distribution of helminths in water buffaloes from the Latium region of Central Italy are very fragmentary and scant. In addition, they were conducted in the '70s (e.g. Rivellini *et al.*, 1972), when buffaloes were mainly bred on pasture and when anthelmintic treatments were not widely used. For these reasons, the present paper reports the results of a cross-sectional survey aimed to obtain up-to-date information on the distribution of different groups and/or species of helminths in water buffaloes from the Latium region, where the farm management system is now characterized by intensive breeding techniques.

**MATERIAL AND METHODS** - The survey was carried out in 20 contiguous municipalities (1,250 km<sup>2</sup> surface area) located in the provinces of Latina and Frosinone (Latium region). A Geographical Information System (GIS) was constructed utilizing as data-layers the topographic base map and the digital aerial photographs of the study area, as well as the geo-referenced points of all the buffalo farms. The survey was carried out on a sample of 127 farms (epidemiological units), selected using a grid approach followed by proportional allocation. For this purpose, a grid representing quadrants of 5 x 5 km was overlaid on the study area within the GIS. The number of farms sampled in each quadrant was proportion-

al to the total number of study population in that quadrant (Cringoli *et al.*, 2005; Rinaldi *et al.*, 2006). In each farm the number of buffaloes tested (adults, heifer/steers and calves) ranged from 9 to 21 based on the number of animals on the farm. The total number of faecal samples collected from the 127 farms was 1883. Copromicroscopic examinations were performed using the FLOTAC technique (Cringoli, 2006). The method showed a sensitivity of 2 eggs per gram of faeces utilizing two flotation solutions, namely a sucrose based solution (specific gravity = 1.250) in order to detect nematode and cestoda eggs, and a zinc sulphate based solution (s.g. = 1.450) in order to detect trematoda eggs (Cringoli *et al.*, 2004).

**RESULTS AND CONCLUSIONS** - The results of the present study are summarized in table 1.

Gastrointestinal strongyles were the most frequent helminths (33.1%) on the tested farms, followed by the liver fluke *Fasciola hepatica* (7.1%), the rumen fluke Paramphistomidae (*Calicophoron daubneyi*; 7.1%), the nematode *Strongyloides* spp. (3.1%), the small liver fluke *Dicrocoelium dendriticum* (2.4%), and the tapeworm *Moniezia* spp. (2.4%).

Table 1. Results (number of positives, % and 95% CI) regarding farms and animals tested for helminths.

Species and/or group of helminths	Farm positivity (no. examined = 127)			Animal positivity (no. examined = 1883)		
	No. of pos.	%	95% CI	No. of pos.	%	95% CI
Gastrointestinal strongyles	42	33.1	25.1-42.0	101	5.4	4.1-6.5
<i>Strongyloides</i> spp.	4	3.1	1.0-8.4	7	0.4	0.2-0.8
<i>Fasciola hepatica</i>	9	7.1	3.5-13.4	25	1.3	0.9-2.0
<i>Dicrocoelium dendriticum</i>	3	2.4	0.6-7.3	3	0.2	0.04-0.5
Paramphistomidae	9	7.1	3.5-13.4	39	2.1	1.5-2.8
<i>Moniezia</i> spp.	3	2.4	0.6-7.3	4	0.2	0.07-0.6

In conclusion, the present survey added data to the parasitological scenario of water buffalo population in Italy, where the progressive transformation of farms (intensive breeding techniques and constant supplies of concentrated and/or stored forages), together with the regular use of anthelmintic treatments, contributed to the decrease of helminth infections, as already shown in water buffaloes of the Caserta province of Southern Italy (Cringoli *et al.*, 1995).

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