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sheep occupying sympatric ranges. Although other ruminants have not been specifically examined for *E. schneideri*, there have been no documented cases of dermal filariasis or other clinical manifestations of elaeophorosis in domestic sheep or exotics on this ranch. The hypothesis that white-tailed deer are potential reservoirs of arterial worms for other species is supported since (1) *E. schneideri* is only known from North America and cases in exotic species (and perhaps domestic sheep) were acquired after their arrival in North America, (2) there are no mule deer or other more suitable hosts in the area, (3) the role of domestic sheep as reservoirs of infection in other enzootic areas (Douglas et al., 1954, Cornell Vet. 44: 252) is tenuous, and (4) the continued presence of *E. schneideri* in deer in certain areas of the southeastern United States and the work of Titche et al. (1979, op. cit.) indicates that patent infections do occur in this species. Therefore, elaeophorosis should be considered as a factor in the management of the several exotic and domestic ruminant species when they occur sympatrically with white-tailed deer in this and other regions.

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Angiostrongylus vasorum (Baillet, 1866) in Red Foxes (*Vulpes vulpes* L.) in Italy

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Adults of *Angiostrongylus vasorum* inhabit the right ventricle of the heart and pulmonary arteries of domestic dogs as well as a variety of wild carnivores (Chertkova, 1962, Tr. Vses. Inst. Gel'mintol. 9: 125–126; Rosen et al., 1970, Am. J. Vet. Res. 31: 131–143; Smith and Threlfall, 1973, Am. Midl. Nat. 90: 215–218; Tarazona, 1974, An. Inst. Nac. Invest. Agrar. Ser. Hig. Sanid. Anim. 1: 161–165). In Europe the parasite has been reported only from France, Ireland and Switzerland (Prestwood et al., 1981, J. Am. Anim. Hosp. Assoc. 17: 491–497). The purpose of this paper is to record the first report of this parasite in Italy.

From January 1981 to February 1983, 180 red foxes from different areas of Tuscany were killed for purposes of rabies control. All were examined routinely and tissue impressions from the lungs were made to search for first stage nematode larvae. Representative lung lesions and other tissues were fixed in 10% buffered formalin, embedded in paraffin, sectioned

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at 6 μm and stained with hematoxylin-eosin, Mallory-Vannucci, Unna-Tänzer-Livini, Perls and PAS stains.

Macroscopically large wedge-shaped areas of reddish-brown coloration with increased consistency, and scattered, slightly raised gray-white encapsulated nodules were observed in the lungs. Right ventricular hypertrophy, enlargement and softness of the pulmonary lymph nodes were also observed, while in some foxes the mesenteric lymph nodes were enlarged. Histopathologically we observed arterial thrombosis, periarteritis and multifocal coalescing granulomas containing eggs, larvae, macrophages phagocytizing Perls positive material and giant cells.

First stage nematode larvae were seen in impression smears of lung tissue. These measured 339 to 390 μm ($\bar{x}$ = 360) in length and 13 to 17 μm ($\bar{x}$ = 16) in width and had wavy tails and an appendage. Adult parasites were found in the right ventricular cavity and in the pulmonary artery. The number of parasites per infected fox ranged from three to 46 ($\bar{x}$ = 18.8, SD = 11.6). Female worms measuring 16 to 22 mm ($\bar{x}$ = 18) in length and 250 to 300 μm ($\bar{x}$ = 268) in width, had a finely streaked and transparent cuticle under which appeared the white genital apparatus wrapped around the reddish intestine. Males were white colored and measured 14 to 16 mm ($\bar{x}$ = 15.4) in length and 180 to 220 μm ($\bar{x}$ = 196) in width. Spicules measured 400 to 480 μm ($\bar{x}$ = 450) in length.

By these morphological characteristics the parasite was identified as *Angiostrongylus vasorum* in 43 of the 180 foxes. Voucher specimens have been deposited in the Museum of Parasitology of the Department of Animal Pathology, Pisa (Coll. No. 2B/68) and in the U.S. National Parasite Collection, Beltsville, Maryland 20705, USA (USNM Helm. Coll. No. 78165).

Recent studies conducted during the period of October 1982 to February 1983 on red foxes revealed a spread of the parasite. After 1 yr foxes infected with *A. vasorum* were found 20 km from the area where the parasite was first identified. Many emigrants work in southern France and in Switzerland where the parasite is endemic. These people return to Italy during the summer with their dogs. The observed increase in the prevalence of *A. vasorum* may be related to the movement of infected dogs into the local area as has been reported previously (Wirth, 1947, Wien Tieraerztl. Monatsschr. 34: 768–777; Jacobs and Prole, 1975, Vet. Rec. 96: 180–183).

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