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Tania A. Cames

Donald J. Forrester

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THE GEOGRAPHIC DISTRIBUTION OF *ANCYLOSTOMA PLURIDENTATUM* AND OTHER HOOKWORMS IN BOBCATS (*FELIS RUFUS*) FROM FLORIDA

TÂNIA A. CAMES AND DONALD J. FORRESTER
Department of Pathobiology, College of Veterinary Medicine
University of Florida, Gainesville, Florida 32611

The finding of the exotic hookworm *Ancylostoma pluridentatum* in Florida felids (Forrester et al. 1985) was intriguing because it had only been reported previously from wild felids and domestic cats in Central and South America (Schwartz 1927, Thatcher 1971, Seesee et al. 1981, Moriena 1983). O'Brien et al. (1990) presented evidence of an introduction of pumas (*Felis concolor*) from Central and South America into southern Florida between 1956 and 1966, and it is believed that *A. pluridentatum* was introduced inadvertently into the state with the release of these cats (McLaughlin et al. 1993).

Because the bobcat (*Felis rufus*) is distributed throughout Florida, it may serve as a reservoir of hookworms for domestic as well as wild carnivores, including the endangered Florida panther (*Felis concolor coryi*). This may be of importance since *A. pluridentatum* is pathogenic to domestic kittens (Forrester 1992) and Florida panther kittens (Dunbar et al. 1994). Its effect on bobcat kittens is unknown. From 1974 to 1991, 85 bobcats were examined at necropsy for hookworms and *A. pluridentatum* was found in 25 of 44 (57%) bobcats from southern Florida (Highlands, Lee, Hendry, Collier, and Dade counties); this hookworm was not found in 41 bobcats examined from northern Florida (McLaughlin et al. 1993).

The purpose of the present study was to reexamine the prevalence of *A. pluridentatum* in bobcats from northern Florida. If this parasite was introduced into southern Florida, then, barring the influence of variables such as climate, geography, or host density and susceptibility, northward spread of the parasite through contiguous populations of bobcats would be expected. The southern boundaries of Hillsborough, Polk, Osceola, and Indian River counties separated northern and southern Florida (Fig. 1).

From 1986 to 1996, bobcats from nine counties in Florida were collected either as road-kills or by hunting. Carcasses were frozen until examination. Recovery, fixation, and preservation of helminths was done as described by Kinsella and Forrester (1972). Hookworms were mounted and cleared in lactophenol for identification and counting. Confirmation of species was impossible in some cases because of the damaged nature of the specimens (i.e., no head, no tail, or both), or because of the presence of debris inside the buccal cavity (one specimen).

Twenty-nine bobcats were used in this study; eight from southern Florida (Collier, Martin, and Sarasota counties) and 21 from northern Florida (Alachua, Brevard, Lafayette, Levy, Osceola, and Wakulla counties). At least one of four species of *Ancylostoma* was found in 16 of 29 (55%) bobcats. Mixed infections with more than one species occurred in 7 of 29 (24%) bobcats; three had two species and four had three species of hookworms. The prevalence and intensity for each species of hookworm are listed in Table 1. In 12 bobcats, identification of all hookworms could not be done for the reasons mentioned above. One bobcat had two specimens of *Monodontus floridanus*. This hookworm is not normally found in bobcats, but has been reported in Florida from cotton rats (*Sigmodon hispidus*; McIntosh 1935) and round-tailed muskrats (*Neofiber alleni*; Forrester et al. 1987). Therefore, since small rodent parts were found in the stomach of this bobcat, it was concluded that this hookworm was a parasite of the rodent, not the bobcat. The

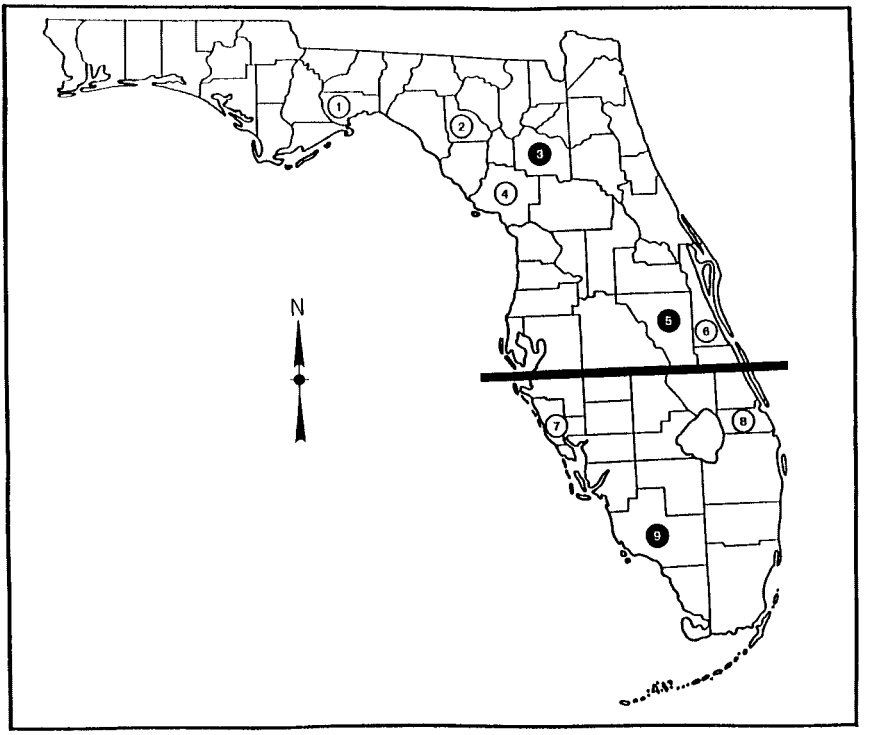

Figure 1. Distribution of *Ancylostoma pluridentatum* in bobcats from Florida. Closed circles represent counties in which the parasite was found; open circles represent counties in which bobcats were examined, but this hookworm was not found. Numbers refer to the county: (1) Wakulla (*n* = 1); (2) Lafayette (*n* = 1); (3) Alachua (*n* = 4); (4) Levy (*n* = 4); (5) Osceola (*n* = 7); (6) Brevard (*n* = 4); (7) Sarasota (*n* = 1); (8) Martin (*n* = 1); (9) Collier (*n* = 6).

other species of hookworms have been reported previously from bobcats in Florida (McLaughlin et al. 1993).

A. pluridentatum was found in eight bobcats: four from Collier County, three from Osceola County, and one from Alachua County. The prevalence of this parasite in northern versus southern Florida was 19% and 50%, respectively, with a mean intensity of five (range, 1-14) in the north and 36 (range, 1-131) in the south. The higher prevalence and intensity of this hookworm in southern Florida was expected if *A. pluridentatum* was first established in the south and has been spreading northward. However, these conclusions are based on a small sample size and until more data are collected, comparison of prevalence and intensity of this parasite by region cannot be understood completely. Our records extend the known range of *A. pluridentatum* to north-central Florida and lead us to believe that the hookworm is moving northward.

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Table 1. Hookworms of 29 bobcats from Florida, 1986-1996.

Species of hookworm	Prevalence		Intensity		
	n	(%)	Mean	Range	Distribution[a]
Ancylostoma pluridentatum	8	28	20	1-135	3, 5, 9
Ancylostoma braziliense	4	14	2	1-6	2, 3, 4
Ancylostoma caninum	9	31	10	1-65	2, 3, 4, 5, 9
Ancylostoma tubaeforme	6	21	5	1-12	2, 3, 4, 7, 9
Monodontus floridanus	1	3	2	—	6
Ancylostoma spp.[b]	12	41	4	1-21	2, 3, 4, 5, 9

[a]Numbers refer to counties in Fig. 1.
[b]Includes all damaged specimens and one with debris in its buccal cavity.

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