= Aonchotheca forresteri =

Aonchotheca forresteri is a parasitic nematode that infects the marsh rice rat (Oryzomys palustris) in Florida . Occurring mainly in adults , it inhabits the stomach . It is much more common during the wet season , perhaps because its unknown intermediate host is an earthworm that only emerges when it rains . The worm was discovered in 1970 and formally described in 1987 . Originally classified in the genus Capillaria , it was reclassified in Aonchotheca in 1999 . A. forresteri is small and narrow @-@ bodied , with a length of 13 @.@ 8 to 19 @.@ 4 mm in females and 6 @.@ 8 to 9 @.@ 2 mm in males . Similar species such as A. putorii differ in features of the alae and spicule (organs in the male) , the size of the female , and the texture of the eggs .

= = Taxonomy = =

Aonchotheca forresteri was discovered during a survey of the endoparasites of Florida marsh rice rats (Oryzomys palustris) by John Kinsella from 1970 to 1972 , and is one of several new parasite species in this study , which was done because there were no previous comprehensive studies of the endoparasites of the species . Together with Danny Pence , Kinsella described the worm in a 1987 paper as Capillaria forresteri ; the specific name honors Donald J. Forrester of the College of Veterinary Medicine , University of Florida . Kinsella and Pence described it as one of many species of Capillaria , a large and taxonomically difficult genus . They suggested that it may be closest to some other small species that live in the digestive systems of mammals , such as the very similar C. putorii , which is found in a variety of carnivorans in North America and Europe . In 1982 , Moravec had placed Capillaria putorii and a number of related species in a separate genus , Aonchotheca , and in 1999 Pisanu and Bain transferred Capillaria forresteri and various other species to that genus from Capillaria . Thus , the species is now known as Aonchotheca forresteri .

= = Description = =

Aonchotheca forresteri is a small , narrow @-@ bodied worm . It is narrowest at the front and increases in width to about three fourths of its length . The cuticle , the surface layer , is smooth . Females are 13 @.@ 8 to 19 @.@ 4 mm long , averaging 16 @.@ 9 mm , which makes them substantially longer than female A. putorii , and 55 to 70 (average 62) ?m wide . The eggs are smooth , lacking the elaborate pattern on the surface seen in A. putorii , and are 53 to 58 (54) ?m long and 21 to 24 (21) ?m broad . The esophagus , the frontmost part of the digestive system , is 2 @.@ 9 to 3 @.@ 9 (3 @.@ 6) mm long and is lined by 36 to 45 (40) cells known as stichocytes . The vulva is located 66 to 105 (83) ?m behind the end of the esophagus and the anus is near the end of the worm , which is rounded .

At 6 @.@ 8 to 9 @.@ 2 (7 @.@ 7) mm , males are only about half as long as females . Their maximum width is 34 to 42 (37) ?m . The length of the esophagus is 2 @.@ 3 to 3 @.@ 0 (2 @.@ 6) mm , of which the muscular pharynx makes up 260 to 315 (273) ?m , and is lined by 35 to 42 (37) stichocytes . The back region of the worm is 4 @.@ 5 to 6 @.@ 2 (5 @.@ 1) mm long . The back , or rectal , opening of the digestive tube is located near the end of the worm , and the length of the cloaca is 530 to 576 (550) ?m . Near the back end , there are two alae (ridges) at the sides (laterally) , which are 40 to 55 (46) ?m long ; these are located at 10 to 15 ?m from another , small ala at the tip . In A. putorii , the lateral alae are much longer and reach the ala at the tip . The spicule , a spikelike structure that functions in reproduction , is curved at the tip and hardened and has a length of 380 to 426 (406) ?m . It is smaller than that of the similar A. tamiasstriati from North American chipmunks and larger than that of A. murissylvatici from various North American and European small rodents , but about as long as that of A. putorii , which however lacks the curved tip .

= = Distribution and ecology = =

Marsh rice rats from Paynes Prairie , Alachua County ; Cedar Key , Levy County ; and Lake Istokpoga , Highlands County , all in Florida , have yielded A. forresteri . In Paynes Prairie , the type locality , 82 of 178 animals examined were infected with 1 to 50 (average 10) worms , but in Cedar Key only a single rat contained one worm . The worms were found in the front part , or fundus , of the stomach , with their front ends in the fundal tissue and their back ends projecting into the inside .

In Paynes Prairie , there was no significant difference in rate of infection between males and females , but only 4 % of juveniles were infected , compared to 52 % of adults . Most species of Capillaria occur in multiple hosts , but A. forresteri has been found only in the marsh rice rat , even though several other small mammals (the round @-@ tailed muskrat , Neofiber alleni ; cotton mouse , Peromyscus gossypinus ; hispid cotton rat , Sigmodon hispidus ; and marsh rabbit , Sylvilagus palustris) occur in Paynes Prairie . The rice rat eats more animal food than any of those , and perhaps A. forresteri has an intermediate host that is not eaten by the other species . A. forresteri is markedly more prevalent in the wet season (spring) than the dry season (autumn) , perhaps because rainfall patterns influence the habits of the rice rat in some way . One possibility is that the intermediate host is an earthworm or other oligochaete worm that moves to the surface when it rains .