Transactions of the Illinois State Academy of Science
(1991), Volume 84, 3 and 4, pp. 145-149

Ochetosoma aniarum (Leidy, 1891) Skrjabin and Antipin, 1957 (Trematoda: Plagiorchiidae) in *Nerodia cyclopion* (Duméril, Bibron and Duméril, 1854)

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ABSTRACT

Ochetosomatid digeneans removed from the oral cavity of *Nerodia cyclopion* captured in Union County, Illinois were identified as *Ochetosoma aniarum.* This represents the first report of this parasite in snakes from Illinois.

INTRODUCTION

Few references are available on the helminths of snakes in Illinois and especially so on the green water snake, *Nerodia cyclopion* (Duméril, Bibron and Duméril, 1854). In conjunction with an ecological study on the status, distribution, and habitat of *N. cyclopion* in Illinois conducted during the summer of 1989 under the direction of Dr. Ronald A. Brandon, Department of Zoology, Southern Illinois University at Carbondale, an opportunity became available to examine digeneans located in the oral cavity of these animals.

In Illinois, the green water snake *(Nerodia cyclopion)* is known only from the extreme southwestern counties of Union and Alexander (Smith, 1961), localities that represent the northernmost edge of the species' geographical range. For that reason, it is listed as a threatened species in Illinois (Illinois Endangered Species Protection Board, 1989). From southern Illinois, the range of *N. cyclopion* extends southward along the Mississippi River valley encompassing the extreme southeastern bootheel of Missouri, extreme southwestern Kentucky (R. Cicerello and J. Mac Gregor, pers. comm), extreme northwestern Tennessee, eastern to south central Arkansas, western Mississippi (T. L. Vandeventer and R. A. Young, pers. comm.), and through Louisiana to the

southeastern coast of Texas. From Louisiana, its range extends eastward along the Gulf Coast through the bootheels of southern Mississippi (T. L. Vandeventer and R. A. Young, pers. comm.) and Alabama (Conant, 1975) (Figure 1). *Nerodia cyclopion* was once recognized as consisting of two subspecies, *N. c. cyclopion* and *N. c. floridana*. Recently, Lawson (1987) raised the more eastern subspecies, *N. c. floridana*, to species level on the basis of his electrophoretic analysis of the genus.

MATERIALS AND METHODS

A single *Nerodia cyclopion* was captured in Union County, southern Illinois on 14 March, 1989. The oral cavity was examined within a few hours of capture for the presence of parasites. Six digeneans were recovered with a cotton swab saturated with tap water, and then transferred to a container of tap water where egg release was observed. After all or most of the eggs were released from the uterus, each digenean was transferred to a slide, and a crystal of urethane added to the water to induce relaxation. A coverslip was then added and the specimen was fixed in AFA (alcohol-formalin-acetic acid), stained with Harris' hematoxylin, dehydrated, cleared in beechwood creosote and mounted in Canada balsam. Voucher specimens have been deposited in the United States National Museum (USNM) Helminthological Collection, U.S. Department of Agriculture, Beltsville, Maryland, No. 80878. The green water snake was released at its capture site.

RESULTS AND DISCUSSION

Ochtosoma aniarum (Leidy, 1891) Skrjabin and Antipin, 1957 was first described by Leidy (1891) under the name *Distomum aniarum*. Dubois and Mahon (1959) listed *Renifer acetabularis* Crow, 1913, *Renifer natricis* MacCallum, 1921, *Renifer texanus* Harwood, 1932, *Renifer orula* Talbot, 1934, and *Renifer wardi* Byrd, 1936 as synonyms of *O. aniarum* and provided a key for the differentiation of the various species of *Ochetosoma*. It appears that Dubois and Mahon (1959) were unaware of the publication of Skrjabin and Antipin (1957) whereby *R. acetabularis*, *R. texanus*, *R. orula*, and *R. wardi* were transferred to the genus *Ochetosoma*. According to the key given by Dubois and Mahon (1959), *O. aniarum* may be differentiated from all the other species of *Ochetosoma* according to the position of the genital pore which is even with the oral sucker and the distribution of the vitellaria which are divided into two groups of follicles pre- and postacetabular). We concur with their synonymy. According to the description and figure of *R. orula* presented by Talbot (1934), the follicular groups are not separated. However, examination of the type specimen U.S. Nat. Mus. Helm. Coll. No. 8626 reveals that Talbot's description is inaccurate as the vitellaria are distributed into pre- and postacetabular groups.

In a study of the differences in measurements of morphological features between live and fixed specimens of *Ochetosoma aniarum* and *O. ellipticum*, Dronen and Guidry (1977) presented data suggesting that the absolute dimensions of various body parts are inadequate criteria for differentiating species of *Ochetosoma*. This may be due to the fact that fixation techniques are not

standardized and because some specimens have been described from live material and other from fixed material. Our identifications were based on the criteria used by Brooks (1979) in differentiating specimens of *Ochetosoma*, namely: the vitelline configuration, the sucker ratio, the location of the genital pore, the posterior extent of the cirrus sac, and the amount of glandulatiom inside the cirrus sac.

Ochetosoma aniarum has been reported previously by Yamaguti (1971) from the mouth, esophagus or lungs of several snake hosts including *Nerodia sipedon* (as *Natrix sipedon*) *Nerodia fasciata* (as *Natrix sipedon fasciata*), *Nerodia fasciata confluens*, *Nerodia rhombifer* (as *Natrix rhombifera*), *Nerodia cyclopion* (one record as *Natrix cyclopion*), *Nerodia erythrogaster* (one record as *Natrix erythrogaster*), *Coluber constrictor*, *Heterodon platirhinos* (as *Heterodon contortrix*), *Agkistrodon piscivorus leucostoma*, *Lampropeltis getulus floridana*, and *L. g. holbrook*]. The present report represent the first finding of *O. aniarum* in the mouth of a snake from Illinois.

ACKNOWLEDGMENTS

Joe Newcomb, head ranger for the United States Forest Service district office in Jonesboro, Illinois, issued Shawnee National Forest permit No. 73-13 for collection and research in the La Rue-Pine Hills Ecological Area. Glen Kruse, Endangered Species Project Manager for the Illinois Department of Conservation, issued state permit for possession of endangered or threatened species No. 89-2S for capture, temporary holding, and release of the green water snake. Both permits were issued to the junior author.

Dr. Ronald A. Brandon and John L. Carr offered helpful suggestions on the manuscript. Harry C. Moeller and Kenneth D. Andrews assisted in fieldwork. Terry L. Vandeventer and Robert A. Young supplied information of the range of *N. cyclopion* in Mississippi. Tom R. Johnson, Missouri Department of Conservation, offered suggestions for mapping the range of *N. cyclopion* in Missouri. Joseph T. Collins and John Simmons, of the University of Kansas Museum of Natural History, supplied information on the range of *N. cyclopion* in Tennessee. Ron Cicerello, Kentucky Nature Preserves Commission, and John MacGregor, Kentucky Department of Fish and Wildlife Resources, supplied information of the range of *N. cyclopion* in Kentucky.

LITERATURE CITED

Brooks, D. R. 1979. New records for amphibian and reptile trematodes. Proc. Helminthol. Soc. Wash. 46: 286-289.

Byrd, E. E. 1936. A new trematode parasite, *Renifer wardi* n. sp. from the watersnake *Natrix rhombifera*, from Columbus, Mississippi. J. Parasitol. 22: 229-231.

Conant, R. 1975. A Field Guide to Reptiles and Amphibians of Eastern and Central North America, 2nd ed. Houghton Mifflin Company, Boston, xviii + 429 pp.

Crow, H. E. 1913. Some trematodes of Kansas snakes. Kansas Univ. Sci. Bull. 7: 125-134.

Dronen, N. O. and E. V. Guidry. 1977. The use of selected ratios as an additional comparative tool in the systematics of some digenetic trematodes (Ochetosomatidae). Proc. Helminthol. Soc. Wash. 44: 223-225.

Dubois, G. and J. Mahon. 1959. Etude de quelques trématodes nord-americans (avec note sur la position systématique de *Parorchis* Nicoll, 1907) suivie d'une revision des generes *Galactosomum* Looss 1899 et *Ochetosoma* Braun 1901. Bull. Soc. Neuchatel Sc. Nat. 82: 191-229.

Duméril, A. M. C., C. Bibron, and A. Duméril. 1854. Erpétologie générale ou histoire naturelle complète des reptiles. Librairie Encyclopédique de Roret, Paris. 7, part 1, vii + xvi + 780 pp.

Harwood, P. D. 1932. The helminths parasitic in the Amphibia and Reptilia of Houston, Texas, and vicinity. Proc. U. S. Nat. Mus. 81, Art 17: 1-71.

Illinois Endangered Species Protection Board. 1989. Checklist of Endangered and Threatened Animals and Plants of Illinois. Illinois Department of Conservation, Springfield. ii + 24 pp.

Lawson, R. 1987. Molecular studies of Thamnophiline snakes: 1. The phylogeny of the genus *Nerodia*. J. Herpetol. 21(2): 140-157.

Leidy, J. 1891. Notices of some entozoa. Proc. Acad. Nat. Sc. Phil. 43: 234-236.

MacCallum, G. A. 1921. Studies in helminthology. Part 1. - Trematodes. Zoopathol. N. Y. 1: 135-204.

Skrjabin, K. I. and D. N. Antipin. 1957. Plagiorchioidea Dollfus, 1930 In Skrjabin, K. I. Trematodes of animals and man. Moskva 13: 453-598.

Smith, P. W. 1961. The amphibians and reptiles of Illinois. Bull. Illinois Nat. Hist. Surv. 28 (art. 1): 1-298.

Talbot, S. B. 1934. A description of four new trematodes of the subfamily Reniferinae with a discussion of the systematics of the subfamily. Trans. Am. Microscop. Soc. 53: 40-56.

Yamaguti, S. 1971. Synopsis of Digenetic Trematodes of Vertebrates. Keigaku Publishing Co., Tokyo, Japan. 1074 pp.

Figure 1. Known geographic range of *N. cyclopion* (modified from Conant, 1975).