First report of *Seuratascaris numidica* Seurat, 1917 (Nematoda: Ascarididae) and other helminths from amphibians of West Bengal, India

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Abstract Studies on nematode parasites from anuran hosts from Eastern India, particularly West Bengal, are rare. To our knowledge, there is a report of larvae of *Monhysterides* sp. (a fish parasite) from cysts within the body cavity and musculature of *Duttaphrynus melanostictus*, *Hoplobatrachus tigerinus* and *Euphlyctis hexadactylus* as well as descriptions of *Aplectana duttaphryni* from *D. melanostictus*, *Aplectana dubrajpur* from *H. tigerinus*, *Cosmocerca microhylae* from *Microhyla rubra* and *Rhabdias bulbicauda* from *D. melanostictus*. Here, we report mature individuals of typical anuran parasites, *Diplodiscus amphichrus* and *Seuratascaris numidica*, from *H. tigerinus* and larvae of Acuariidae (a bird parasite) from *Fejervarya limnocharis* collected in Kulti, West Bengal.

Keywords *Diplodiscus amphichrus* · *Seuratascaris numidica* · Anura · West Bengal · India

Introduction

During a survey of amphibians from the Kulti Industrial region of West Bengal, India, four frogs (two *Fejervarya limnocharis*; two *Hoplobatrachus tigerinus*) were collected and examined for helminth parasites. Gravid individuals of one species of Trematoda and one species of Nematoda as well as larvae of two species of Nematoda were found. To our knowledge, there are five reports of helminths in West Bengal anurans. Sarkar and Manna (2002) reported larvae of *Monhysterides* sp. (a fish parasite) from cysts within the body cavity and musculature of *D. melanostictus* (= *Bufo melanostictus*); *H. tigerinus* (= *Rana tigrina*) and *Euphlyctis hexadactylus* (= *Rana hexadactyla*) from Belur, Liluah, Habra and Sonarpur; Sarkar and Manna (2004) described *Rhabdias bulbicauda* from the lungs of *D. melanostictus* (= *Bufo melanostictus*) from Belur and Habra; Sou et al. (2014) described *Aplectana duttaphryni* from the intestine of *D. melanostictus* from Kulti; Sou and Nandi (2015a, b) described, first, *Cosmocerca microhylae* from *Microhyla rubra* and, secondly, *Aplectana dubrajpur* from *H. tigerinus*, both from the Birbhum district, West Bengal. The purpose of this note is to report additional helminth infections from anurans of West Bengal, India, particularly the Kulti region.

Materials and methods

Four frogs (two *F. limnocharis*; two *H. tigerinus*) were collected from the Kulti area of the Asansol-Durgapur industrial region of West Bengal State, India (23°43'60"N, 86°50'60"E; elevation 114 and 156 m, respectively) and examined for helminths. A mid-ventral incision was made in the body wall and the digestive tract was removed,

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opened and examined under a stereomicroscope (Bausch and Lomb Stereo Zoom 5). Helminths and cysts containing nematode larvae were found, fixed in 4 % formalin, cleared in glycerol, mounted separately on glass slides, and studied under a compound microscope (Leica ATC 2000). Specimens have been deposited in the Helminthological collection, Parasitology Laboratory, Burdwan University, Durdwan, West Bengal, India (PLBU). Anuran taxonomy follows Frost (2014).

Results

Seven gravid individuals of the trematode *Diplodiscus amphichrus* Tubangui (1933) (PLBU 170A) and two gravid individuals of the nematode *Seuratascaris numidica* Seurat (1917) (PLBU 171A) were found in the intestine and stomach, respectively, of one *H. tigerinus*. No parasites were found in the second *H. tigerinus*. Larva representing two species of Nematoda (Acuaridae, species I and II) PLBU 172A, 173A, respectively) were found in cysts in the body cavity of *F. limnocharis*: five individuals of species I in the first host; four individual of species II in the second host. The occurrences of *Diplodiscus amphichrus* and *Seuratascaris numidica* represent new locality records and, to our knowledge; this is the first report of larval nematodes in *F. limnocharis*.

Discussion

Diplodiscus amphichrus was described by Tubangui (1933) from Philippine frogs (*Rana* spp.); two subspecies, *Diplodiscus amphichrus brevis*, and *Diplodiscus amphichrus mangus*, have been described from *Euphlyctis cyanophlyctis* (= *Rana cyanophlyctis*) collected in India. *Diplodiscus sinicus* described from *F. limnocharis* collected in China is considered a synonym. *Diplodiscus amphichrus* has been reported from many localities across India, additional hosts include *Chirixalus vittatus*, *H. tigerinus*, *Polypedates leucomystax*, *Rhacophorus maximus*, and unidentified species of *Bufo* sp and *Rana* sp. (Mukherjee and Ghosh 1972; Nama and Khichi 1973; Imkongwapang et al. 2014). Kulti, West Bengal is a new locality record for *Diplodiscus amphichrus*.

Seuratascaris numidica was originally described as *Porrocaecum numidicum* from *Pelophylax saharicus* (= *Rana saharicus*) collected in Algeria by Seurat (1917), but reassigned to *Seuratascaris* by Sprent (1985). It has been reported in Australian, Palaearctic and Oriental biogeographic regions (Bursey et al. 2008), but to our knowledge this is the first report from India. Sprent (1985) reported both *F. limnocharis* and *H. tigerinus* as hosts but gave no

collection locality. Gupta (1959, 1960) reported *H. tigerinus* collected in Bangladesh as host for *Seuratascaris numidica* (= *Amplificaecum ranae* and *Amplificaecum cacopi*). It should be noted that Sou et al. (2014) described *Aplectana duttaphryni* in *D. melanostictus* from Kulti region; Sou and Nandi (2015a) described *Aplectana dubrajpurii* in *Hoploaatrachus tigrinus*; and, Sou and Nandi (2015b) described *Cosmocerca microhyla* in *Microhyla rubra*, from the Birbhum district, West Bengal, India. This report of *Seuratascaris numidica* is the second record of gravid amphibian nematodes from Kulti Industrial region of West Bengal.

Acuariid nematodes typically mature in aquatic birds, although a few species are found in mammals; they require an arthropod intermediate host and frogs may serve as paratenic hosts (Anderson 2000). The occurrence of Acuariidae in amphibians and reptiles was summarized in Goldberg et al. (2007). *H. tigerinus* represents a new host record for Acuariid larvae.

In summary, nine helminth species (one species of Trematoda, eight species of Nematoda, gravid individuals of five species and three species represented by larvae) have now been reported from West Bengal.

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