

***Aplectana* sp., nematode parasite of *Bufo stomaticus* from Kirtipur, Nepal**

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Available online at: www.isca.in, www.isca.me

Received 29th April 2016, revised 3rd May 2016, accepted 20th May 2016

Abstract

Aplectana sp. is a parasite of the alimentary canal of amphibians and reptiles. During the period of April to June 2013, 20 *Bufo stomaticus* were collected from Kirtipur, Nepal. All live toads were anaesthetized, dissected in saline water and alimentary canals were examined thoroughly for nematode parasites. The nematode parasites collected were taxonomically studied and identified as *Aplectana* sp. distinguished characters revealed short oesophagus, narrow and pointed tail. All the infected hosts were found to be infected by 60% of *Aplectana* male nematode parasite and female parasite with equal intensity i.e. 8.67. This nematode parasite is the new record from *B. stomaticus* from Kirtipur, Nepal.

Keywords: *Aplectana* sp., *Bufo stomaticus*, Kirtipur, Nematode, Prevalence.

Introduction

Bufo stomaticus (Figure-1) belongs to the family Bufonidae. This family is represented by a single genus and 4 species in Nepal¹. They are true toads, with short, robust habitus, and a thick, glandular skin with numerous warts. They are widely distributed throughout the country from the Terai to the higher mountainous regions¹.

Aplectana sp.² is a cosmopolitan nematode parasite. Parasite has been reported from infected toads³. Specimens of *Rana aurora aurora* collected in British Columbia, was found to be infected with *Aplectana lynae* n.sp⁴. *Aplectana itzocanensis* and *Aplectana incerta* had reported from amphibians⁵. *Aplectana incerta* and *Aplectana itzocanensis* has been reported from *Bufo retiformis*⁶. The previous research has been described measurement of *Aplectana* spp. (Table-1)^{7,8}. The alimentary nematode parasites of amphibians and reptiles have been recorded from numerous countries such as Kuwait⁹, Michigan¹⁰, Papua New Guinea¹¹, Vietnam¹² and Turkey¹³. This study present reported confers the evidence of the first *Aplectana* sp. reported in *Bufo stomaticus* from Kirtipur, Nepal.

Methodology

A total of twenty *B. stomaticus* were collected from Kirtipur, Nepal. Anaesthetized the live toads, dissected ventrally and collection of parasites from alimentary canal. Saline solution was use to kept collected nematode parasites and finally 70% ethanol to store them. Cleared parasites by Lactophenol and the taxonomic characters were compare by taxonomic key^{14,15}. Measurements of the specimen are given in micrometers (µm) unless stated. Prevalence and intensity of infection was calculated using formula as described earlier; Percentage of infection = total no. of host infected x 100/ total no. of host,

Intensity of infection = total no. of parasites collected or showed/ total no. of host infected^{16,17}.

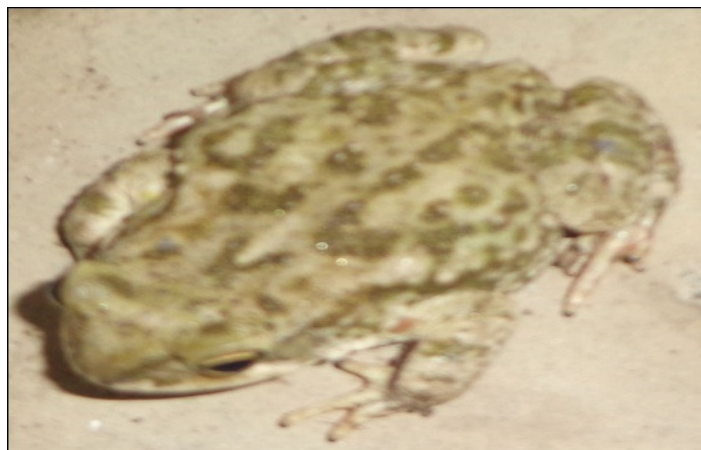


Figure-1
Bufo stomaticus

Results and Discussion

Oxyuridae family has three subfamilies: Oxyurinae, Cosmocercinae and Oxysomatiinae. *Aplectana* sp. parasites of alimentary canal of amphibians and reptiles has prodelfphys, sexual dimorphism pronounced, male with two equal spicules, gubernaculum usually present belong to cosmocercinae^{14,15}. Male with a spicules single (rarely imperfect chitinized or even absent), gubernaculum absent belongs to Oxyurinae^{14,15}. Sexual dimorphism not pronounced, pharynx absent or short if at all, oesophagus with posterior bulb, male with two equal or subequal spicules. Gubernaculum present or absent, amphidelphys belongs to Oxysomatiinae^{14,15}. Diagnostic traits of the *Aplectana* are lateral flanges present, mouth with three lips, buccal cavity small, armed or not. Excretory pore anterior to oesophageal bulb; Male: posterior extremity bent ventrally,

rapidly narrowing behind anus and ending in pointed tail, spicules equal, usually slender, not winged, gubernaculum present; Female: posterior extremity conical, pointed, vulva near middle of body, oviparous, viviparous^{14,15}. The alimentary canal nematodes parasites of *Bufo stomaticus* were collected from Kirtipur, Nepal. The morphometric characteristics and measurements described below.

Morphological Characteristics of *Aplectana* sp.: Male: Small slender body (Figure-2A). Mouth with three lips, buccal cavity small (Figure-2D). Short oesophagus with small bulb (Figure-2F and 2G). Anterior parts thinner than posterior part (Figure-2B and 2C). Posterior extremity bent ventrally flanges present in middle part of the body and anus distinct (Figure-2H). Lateral

flanges present in middle part (Figure-2E). Tail narrow and pointed (Figure-2I). Measurements of the body of male *Aplectana* sp. is shown in Table-2.

Female: Females of slightly greater length than males (Figure-3A). Mouth with three lips (Figure-3E). Oesophagus smaller than male, but bulb is approximately same (Figure-3F). Anterior part little thinner than posterior part (Figure-3C and 3D). Posterior extremity conical. Rapidly behind anus (Figure-3G). Tail small and pointed (Figure-3H). Vulva near middle of the body. Oviparous or viviparous, female produce egg that larvate in utero before release to the environment where hatching occur (Figure-3B). Measurement of the body of the female *Aplectana* sp. is shown in Table-2.

Table-1
Morphometric variations of closely related species of *Aplectana* spp.

<i>Aplectana</i> sp.	Distribution	Host	Location	Body Parts		References
				Male	Female	
<i>Aplectana artigasi</i> n. sp.	South Chile	<i>Eupsophus calcaratus</i> (Frog)	Intestine	Body length 3.4 mm Body width 294-350 µm Oesophagus length 322-378 µm Oesophagus bulb in diameter 98-182 µm Tail length 528-780 µm	Body length 3.8-6 mm Body width 350-490 µm Oesophagus length 392-602 µm Oesophagus bulb in diameter 112-168 µm Tail 690-952 µm	7
<i>Aplectana herediaensis</i> n. sp.	Costa Rica	<i>Lepidophyma flavimaculatum</i> (Lizard)	Large intestine	Body length 2.3-2.8 mm Body width 95-140 µm Oesophagus length 580-623 µm Oesophagus bulb in diameter 79-92 µm Tail length- absent	Body length 3.8-6 mm Body width 110-165 µm Oesophagus length 617-681 µm Oesophagus bulb in diameter 92-104 µm Tail length- absent	8

Table-2
Morphometric measurements of *Aplectana* sp.

<i>Aplectana</i> sp.	Body	Oesophagus	Oesophagus Bulb	Tail
Male	Length 3.75 mm Width 250- 375 µm	Length 500 µm Width 75 µm	Diameter 125 µm	Length 300 µm
Female	Length 4.75 mm Width 500-600 µm	Length 360 µm Width 50-60 µm	Diameter 125 µm	Length 350 µm

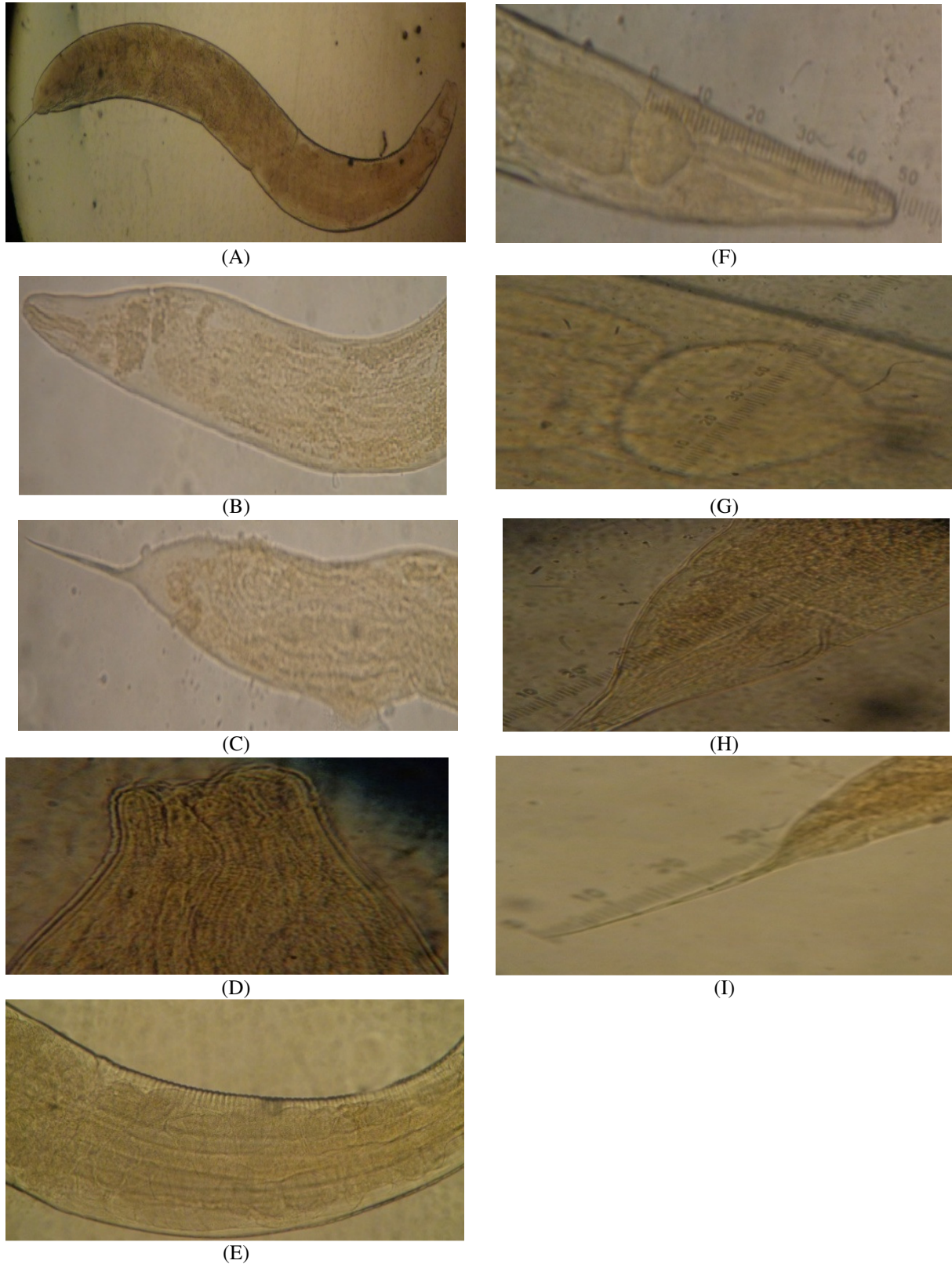


Figure-2

***Aplectana* sp. male A-Whole male parasite, B-Anterior view, C-Posterior view, D- Mouth part, E- Middle part of the body, F- Oesophagus, G- Oesophagus bulb, H- Anus, I- Tail**

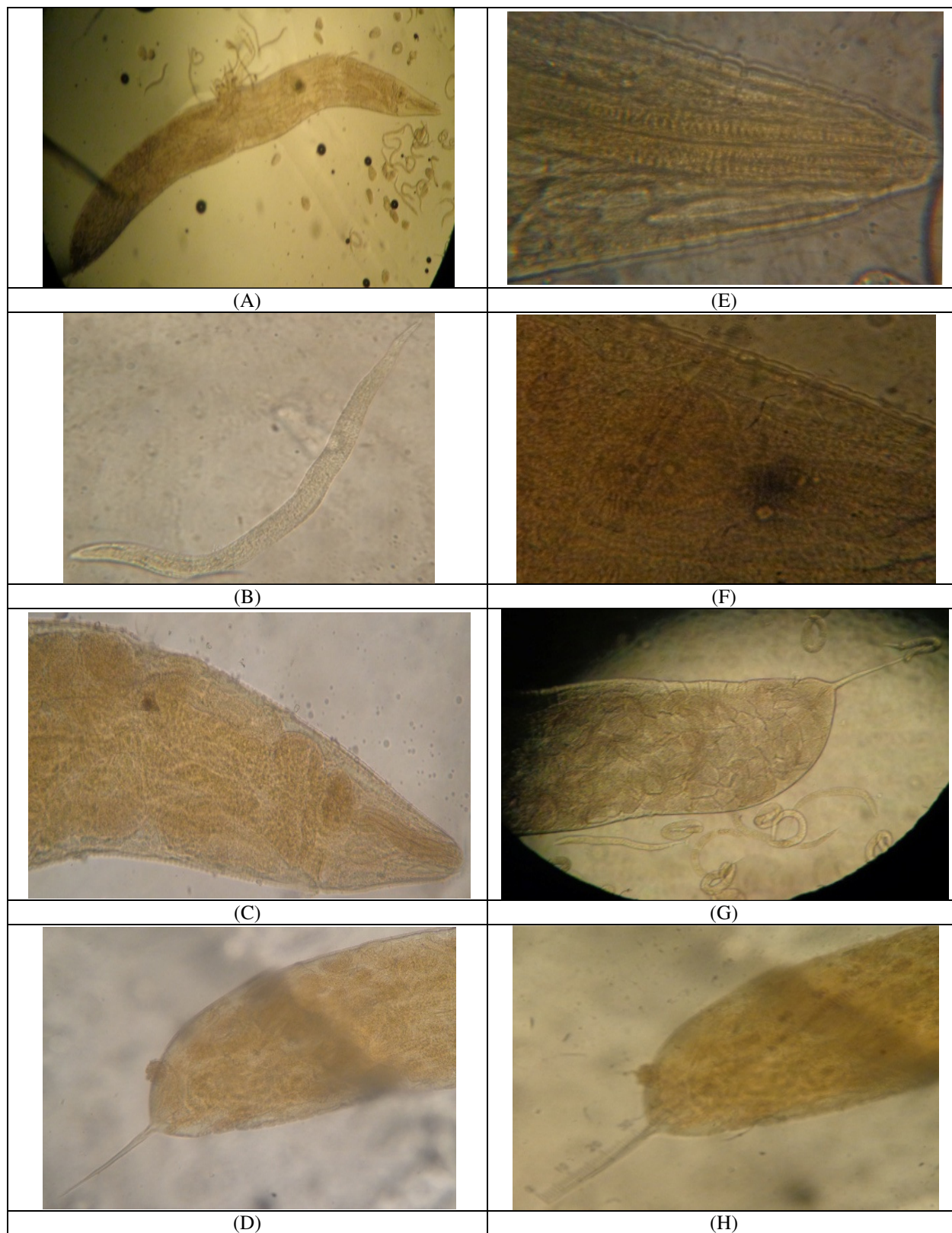


Figure-3

Aplectana sp. female A- Whole female parasite, B-Larva, C- Anterior view, D- Posterior view, E- Mouth, F- Oesophagus
G- Anus, H- Tail

Table-3
Prevalence and intensity of *Aplectana* sp. infecting *Bufo stomaticus*

Month	No. of <i>Bufo stomaticus</i> dissected	No. of host infected by <i>Aplectana</i> sp. Male	No. of <i>Aplectana</i> sp. Male collected	Percentage of <i>Bufo stomaticus</i> infection	Intensity of <i>Bufo stomaticus</i> infection	No. of host infected by <i>Aplectana</i> sp. Female	No. of <i>Aplectana</i> sp. Female collected	Percentage of <i>Bufo stomaticus</i> infection	Intensity of <i>Bufo stomaticus</i> infection
April	1	-	-	60%	8.67	-	-	60%	8.67
May	2	1	46			1	2		
June	17	11	58			11	102		
Total	20	12	104			12	104		

The parasite has been described from different species of amphibians and reptiles^{14,15}. The present nematode seems to be closely related to *Aplectana* sp. On the basis of taxonomic characters and recent reports, the species has been identified as *Aplectana* sp. from *Bufo stomaticus* from Kirtipur, Nepal.

Remark: *Aplectana macintoshii* was highly infected to *Bufo viridis*⁹. Similarly, *Aplectana incerta* has been reported from Costa Rican snakes¹⁸. While, low infection rate of *Aplectana brumpti* has been reported from *Hyla savignyi*¹³.

In current study, Prevalence rate of *Aplectana* sp. has been found to 60% and intensity of parasite was 8.67, Which were high prevalence rate and low intensity as compare to previous reports from another amphibian species including *Bufo viridis* was 32%, 48⁹ and *Hyla savignyi* was 2.5%, 1¹³. According to these taxonomic characters and prevalence reports showed that this nematode is the new record in *Bufo stomaticus* from Nepal.

Conclusion

Aplectana sp. the nematode parasite was the first time recorded of *Bufo stomaticus*, Nepal. Whereas high prevalence rate and low intensity of parasite were found.

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