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Department of Higher Education  
Yangon University of Distance Education**

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Research Journal**

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### References

- Bagley, 1997. Extension veterinarian Internal Parasite. Utah State University Extension.
- Bandyopadhyaya, B., 1999: Journal of Vet Parasitol. 13 (2) : 79-80. Cited by Pathak and Pal 2008.
- Beaver PC, Jung RC, Cupp EW. Clinical parasitology. 9th ed. Philadelphia: Lea & Febiger; 1984. The Strongylida: Hookworms and other bursate nematodes; p. 269-301.
- Cheesbrough., Manica., 1991. *Medical laboratory manual for tropical countries*. Vol.1 Second Edition. Printed in Great Britain at the University Press, Cambridge.
- Chiodini, P.L., Moody, A.H., Mansser, D.W., 2003. *Atlas of medical Helminthology and Protozoology*. Fourth edition, Elsevier Science Limited.
- Forety, W.J. 2001. *Veterinary Parasitology Reference Manual*, 5<sup>th</sup> Ed., Iowa State University Press.
- Hawkins, P.A. 1945 Haemonchus cause immune suppression. 1546: *J. Parasitol.*, 31: 17. India.
- Koinari, M., Karl, S., Ryan, U., Lymbery, A.I., 2012. *Infections level of gastrointestinal parasites in sheep and goats in Pupua New Guinea*.
- Konnerssman, 2005. Presenting information, ideas, and insights for every-one who raises, manages, or just loves goats. *Dairy Goat - Journal*.
- Micozzi, M.S., and V.L.K. Eveland. 1980. Lab approaches to parasitic diseases in the United States. *Lab. Manag.* 12:42-4.
- Rai, S.K., Bajracharya, K., Budhathoki, S., et al., 1995. Status of intestinal parasites at TU Teaching Hospital. *J Inst Med(Nepal)*; 17: 134- 142.
- San San Htay, 2016. Comparative study of helminthes parasites in sheep and goat from Magway township. (M Sc Thesis), Department of Zoology, Magway University.
- Soulsby, E.J. L., 1982. *Arthropods & Strongyloides sp. Protozoa of Domesticated Animals*, 7<sup>th</sup> Edn., ELBS *Moniezia sp.* And Bailliere Tinall, London P.788. *Fasciola Sp.*
- WHO, 1991. *Basic laboratory Methods in Medical Parasitology*. Geneva WHO. The world health Report-conquering suffering enriching humanity.
- Yu Yu Maw, 2015. Incidence of Gastrointestinal Parasites in goat from Magway Township. (M Sc Thesis), Department of Zoology, Magway University.
- Internet Websites  
 Wikipedia. Org/wiki/*Fasciola hepatica*, 2015  
 Wikipedia.org/wiki/ *Trichuris trichura*, 2015  
 www.fao.org / wairdoes / ilri / x5492e / 5492e 0.5htmwww.Veterinary world.org Veterinary world, Vol.3 No. 10 October 2010 456

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## ENDOPARASITES OF ANURANS FROM NORTH DAGON AND KAMAYUT TOWNSHIPS

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### Abstract

This study was conducted at North Dagon Township and Thaton Road, Kamayut Township for exploration and collection of anuran frog and toad hosts. The objective of the study was to investigate and identify the helminth fauna of frogs and toads. In total, eight parasitic species belonging to 2 phylums, 3 orders, 3 families, 6 genera and 5 species were observed. Among them, two species involving in nematodes and 3 species in acanthocephalans are identified. Two species of nematodes and one species of acanthocephalan are placed in species inquiredae due to the unavailability of male specimens.

**Key words:** Anuran, helminth, acanthocephalans, nematodes.

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## Introduction

There are hundreds of species of frogs and toads in the world. Most of these species live in tropical areas and more frogs and toads are found in the hotter countries. A number of them are edible except poisonous species. In addition, (1) frogs serve as good source of food for reptiles, birds, snakes and other zoo animals, (2) frog meat is considered to have medicinal value in Ayurveda, (3) frogs can control the insect population harmful to crops, (4) frog waste can be converted into nutritious fish and livestock, (5) frog skin can be processed and made into valuable leather products and (6) frogs are used for laboratory experiments and cultures (Peter H. Raven, George B. Johnson, Jonathan B. Losos and Susan R. Singer, 2005). Today, frogs numbers continue to dwindle as they are faced with the habitats destruction, pollution, pesticide use, competition with introduced species, increased ultra-violet radiation. Another possible fact is infectious disease and it appears parasites. Parasites are organisms living in or on another organism. There are two main types of parasites: microparasites (virus, bacteria and protozoa) and macroparasites (ectoparasite and endoparasite). Disease can be caused by the microparasites that are transmitted from frogs to humans. But cannot be caused by the macroparasites (Helminths). Helminth is a general term meaning "worm". Helminths are the endoparasites. Helminths are large multicellular organisms. They are also called the intestinal worms. Amphibians have a rich diversity of helminth parasites (Poynton and Whitaker, 2001). In general, most helminth parasites of amphibians are innocuous, weak, decrease their weight and inactive. But some made amphibians cause deformities and even death. Many had worked on helminth. Among amphibians, anurans are definitive hosts to several classes of helminth parasites, including Cestoda, Trematoda, Nematoda, and Acanthocephala. (Abigail A. Imasuen et al, 2012). In 1979, the study on parasites of amphibians including frogs and toads has been made only by Khin Maung Win. Thus we had taken this opportunity to undertake as a special topic.

## Objectives

- To investigate and identify the helminth fauna of frogs and toads
- To update data on occurrence of parasites in the hosts.

## Materials and Methods

Frogs and toads were collected from North Dagon Township and Thaton Road, Kamayut Township.

After killing the frogs and toads, they were cut and opened and the alimentary tract was dissected out and placed in the petridish containing normal saline. The parasites were searched in the body cavity and outside the peritoneal cavity. Various glands such as liver, lung, kidney, muscle, mesentry and the subcutaneous connective tissue and under the skin were properly examined. They were collected with the help of fine forceps and placed in petridish containing normal saline. Alimentary tract was separated out into three parts, namely stomach, intestine and rectum. The alimentary tract was then slit opened by fine scissors and free living worms were readily collected from the alimentary tract by using a brush and then placed in petridish containing normal saline.

Nematodes were usually found in large number inside the hosts. The collection of the acanthocephalans from the muscles needed care and this is important to obtain good specimens with protruded proboscis. After the collected worms were thoroughly washed in saline and distilled water, they were preserved in 70 percent ethyl alcohol.

The fresh and some live specimens were placed on a glass slide, covered with cover slip and examined under the microscope. After observations, the worms were then transferred into a small bottle and preserved in 70 percent ethyl alcohol. The bottles were labeled with the following data including the type of host, parasites (Nematodes or Acanthocephalans, Cestodes

or Trematodes), type of location, date of collection and serial numbers of bottles and the numbers of male (s) and female (s) etc.

Before identifying the specimens, the preserved worms were immersed in lactophenol for about 30 minutes or cleaning agent to get a better viewing of specific characters of every internal organ of the worm which are essential for identification of the specimens.

The parasites were presented with color photographs. Measurements of the worms and other structures were made, using eye piece micrometer and calibrated with the stage micrometer.

The identification and classification of the examined parasites were based on Yamaguti (1961, 1963). Those that could not be identified were placed as species inquirendae.

**Results**

During the study period, altogether 52 numbers of frogs and toads of North Dagon Township and Thaton Road, Kamayut Township had been collected and dissected. The systematic position of the frogs and toads were indicated in Table (1). A total of four species: under one order, four families, four genera were collected.

The parasitic helminths collected from the above hosts were identified and classified into their systematic position as shown in Table 3. Eight parasitic species belonging to two phylums, three orders, three families, six genera and five species were observed.

The Neamtodes belonging to four genera and two species, namely *Neoraillietnema praeputiale* (Skayabin, 1916), *Meterakis govindi* (Karve, 1930), *Aplectana* sp: inquirendae, *Paracosmocerca* sp inquirendae, were observed.

The Acanthocephalans belonging to two genera and three species, namely *Acanthocephalus bufonis* (Yamaguti, 1954), *Acanthocephalus ranae* (Schrank, 1786 and Liihe, 1911), *Acanthocephalus* sp: Inquirendae, *Pseudoacanthocephalus bufonis* (Shipley, 1903 and Pectrotschenko, 1958 ) had been classified.

The above parasites, described in detail with illustrations and measurements were also included. A check list of the parasites harbouring in various hosts was compiled in Table 4.

Two species of nematodes and one species of acanthocephalans are placed in species inquirendae due to the unavailability of male specimens.

Table 1. Showing the systematic positions of the frogs and toads

Class	Order	Family	Genera	Species	Local Name
Amphibia	Anura	Bufonidae	<i>Bufo</i>	<i>Bufo melanostictus</i>	Phar pyot
		Microhylidae	<i>kaloula</i>	<i>Kaloula pulchra</i>	Phar gon nyin
		Rhacophoridae	<i>Rhacophorus</i>	<i>Rhacophorus leucomystax</i>	Phar pyan
		Ranidae	<i>Rana</i>	<i>Rana tigrina</i>	Kyaw San Kay

Table 2. The helminth parasites infecting frogs and toads which have been examined

No	Type of host	Total No. of host	T		N		A		C	
			I	U	I	U	I	U	I	U
1	<i>Bufo melanostictus</i>	37			77	40	37	8		
2	<i>Kaloula pulchra</i>	3								
3	<i>Rana tigrina</i>	6					6	17		
4	<i>Rhacophorus leucomystax</i>	6		11	11					3
		52		11	88	40	43	25		3

- T = Trematode
- N = Nematode
- A = Acanthocephala
- C = Cestode
- I = Identified
- U = Unidentified

Table 3. Showing the general grouping of the helminth parasites from some frogs and toads which have been examined

Phylum	Order	Family	Genera	parasites
Nematode	Oxyuridea	Oxyuridae	<i>Aplectana</i>	<i>Aplectana sp: inquirendae</i>
			<i>Paracosmocerca</i>	<i>Paracosmocerca sp: inquirendae</i>
			<i>Neoraillietnema</i>	<i>Neoraillietnema praeputiale</i>
			<i>Meterakis</i>	<i>Meterakis govindi</i>
Acanthocephala	Echinorhynchidea	Echinorhynchidae	<i>Acanthocephalus</i>	<i>Acanthocephalus bufonis</i>
			<i>Acanthocephalus</i>	<i>Acanthocephalus ranae</i>
			<i>Acanthocephalus</i>	<i>Acanthocephalus sp: inquirendae</i>
	Giganthorhynchidea	Pseudoacanthocephali dae	<i>Pseudoacanthocephalus</i>	<i>Pseudoacanthocephalus bufonis</i>

Table 4. A check list on helminth parasites which occur in some frogs and toads

Host	Parasites
<i>Bufo melanostictus</i>	<i>Aplectana sp: inquirendae</i>
	<i>Paracosmocerca sp: inquirendae</i>
	<i>Neoraillietnema praeputiale</i>
	<i>Meterakis govindi</i>
	<i>Acanthocephalus bufonis</i>
	<i>Acanthocephalus ranae</i>
	<i>Acanthocephalus sp: inquirendae</i>
	<i>Pseudoacanthocephalus bufonis</i>
<i>Kaloula pulchra</i>	
<i>Rhacophorus leucomystax</i>	<i>Neoraillietnema praeputiale</i>
	<i>Paracosmocerca sp: inquirendae</i>
<i>Rana tigrina</i>	<i>Acanthocephalus ranae</i>

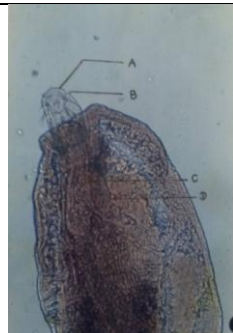


Figure 1. *Acanthocephalus ranae* at stomach and intestine from *Bufo melanostictus* showing proboscis (A), with hooks (B), Proboscis receptacle (C) and Lamnisci (D)



Figure 2. *Acanthocephalus ranae* at stomach and intestine from *Bufo melanostictus* showing testis (A), Cement glands (B) and Anus(C)



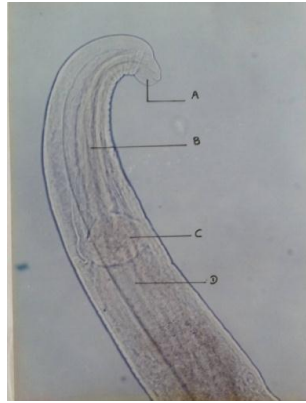


Figure 3. *Neorailletnema praeputiale* at small intestine from *Rhacophorus leucomystax* showing Pharynx (A), Oesophagus (B), Oesophageal bulb (C) and Intestine (D)

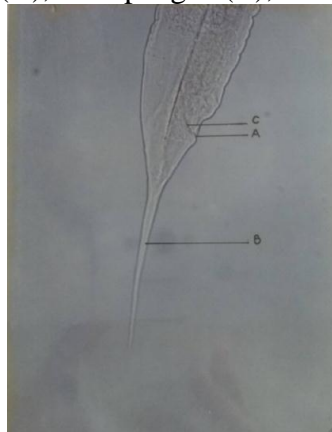


Figure 4. *Neorailletnema praeputiale* at small intestine from *Rhacophorus leucomystax* showing Anus (A), Tail (B), and Rectum (C)

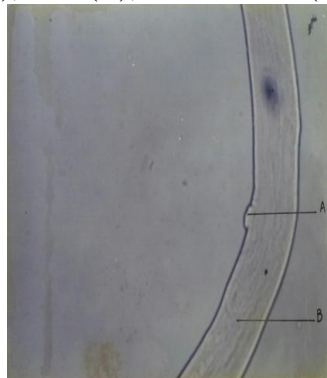


Figure 5. *Neorailletnema praeputiale* at small intestine from *Rhacophorus leucomystax* showing Vulva (A) and Egg (B)

### Discussion

Anurans serve not only as intermediate hosts but also as transport hosts. In addition, helminth parasites reach the hosts by many ways depending on the species of worm and the nature of its life cycle. So we decided to do this research. Our experiment relied on studying anuran's internal organs for the presence of helminth infection.

In this study, the nematodes were the most commonly infecting toad anuran, namely *Bufo melanostictus*. *Rhacophorus leucomystax* harboured nematode followed by *Bufo melanostictus*. This may be due to the fact that more toad populations were collected, more increase in size, more flux of energy (that is, food) and more terrestrial. Among nematodes, *Neorailletnema praeputiale* (Skarjabin, 1916 and Ballesteros Marquez, 1945) was maximum prevalent parasites, *Meterakis govindi* (Karve, 1930) was most prevalent followed by genus

*Neoraillietnema*, whereas, *Aplectana* and *Paracosmocerca* were the least prevalent genera. The nematode parasites were found attached to the organs of the viscera (small intestine and rectum).

Acanthocephalans require at least 2 hosts in the life cycle; arthropods are the usual intermediate hosts in which the infective stage develops, when eaten by an appropriate final host, the parasite develops to maturity in the digestive tract (Nickol, B.B. 1985). The finding of this study was similar to Nickol (1985), who said that, four species of Acanthocephalans were found in stomach, intestine and rectum. Some Acanthocephalans attached itself to the stomach wall of its host using its mouth, some were recovered in the small intestine and some in the rectum of *Bufo melanostictus* and *Rana tigrina*.

Three Cestodes and eleven Trematodes cannot be identified because they had been found at the last moment of the work.

No helminth infection was found in *Kaloula pulchra* due to only 3 numbers of hosts were collected.

This study helps us better understand what causes infectious disease and gives an account on the distribution of anurans and its helminth parasites.

### Conclusion

In this examination, 210 helminth parasites infecting 52 numbers of frogs and toads were recorded. Among frogs and toads, 117 Nematodes and 45 Acanthocephalans were found in *Bufo melanostictus*. None of the parasites were found in *Kaloula pulchra*. Twenty- three Acanthocephalans harboured in *Rana tigrina*. Eleven Trematodes, eleven Nematodes and three Cestodes were harboured in *Rhacophorus leucomystax*. It shows that Nematodes were found most abundant. Based on this information gained by us, the further studies on parasites will be conducted.

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### References

- A bigail A.Imasuen et al (2012) International Journal of Zology Volume 2012, Article ID 823970, 7 pages.
- Khin Maung Win (1979) Helminth parasites of same frogs and toads of Burma. M.Sc Thesis, University of Rangoon. P 95-97, P 102-105, P 109-111, P 121-123, P 155-157
- Majbarbi(1983) study of same Mon and Karen States Anurans and some of their tadpoles. M.Sc. Thesis, University of Rangon. P 18,23,126,141
- Nickol, B.B.(1985) Epizootolog. In: Crompton, D.W.T and Nickol, B.B. (eds), Biology of the Acanthocephala: 307-346. Combridge University Press, Cambridge.
- Peter H. Raven et al (2005) Vertebrates: In Biology, 7<sup>th</sup> Edition P 683-728, McGraw- Hill Companies, Inc. Boston.
- Poynton and Whitaker (2001) Protozoa and metazoan infecting amphibians. In wright KM, Whitaker B.R, eds. Amphibian Medicine and captive Husbandry. Malabar FL: Krieger Publishing Company, P 193-221.
- Storer and Usinger(1971) General Zoology (6<sup>th</sup> edition) Mc Graw-Hill Book Compay P 407-710, P711-712
- Yamaguti, S (1961) Systema Helminthum. The nematodes of veterbrated Interscience Publisher, Inc New York, London. Vol. III . Part 1 and 2. P 82-118, P 681-704
- Yamaguti, S (1961) Systema Helminthum. Acanthocephala Interscience Publisher, New York, London. Vol. V . P 44-155

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