

## Conference Paper

# *Spirometra* in *Ptyas mucosus* Snake in Sidoarjo, Indonesia

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## Abstract

Currently snake is not only limited as performing animals, medicine, food and raw materials factories but also as pets. One of the famous snakes found in Indonesia is *Ptyas mucosus*. Snake is a port of the various parasitic zoonoses and unzoonoses. In *P. mucosus* also frequently reported cases of occurrence sparganosis. Sparganosis is a parasitic infection caused by the larvae *spirometra* or called spargana. The aim of this reasearch to study of the morphology of *Spirometra* in *P. Mucosus* snake from snakes collector in Sidoarjo, East Java. Identification adult worm and larvae in wet prepararat using a stereo microscope. Identification with Carmine staining and clearing with Glycerin using a light microscope with a magnification of 40x and 100x. The result found that *P. mucosus* was infected by larva of *Spirometra*. Sixty snakes were observed and 41 snakes were positively infected by the spargana (68%). Spargana found in musculus and subcutaneous snake *P. Mucosus*. Spargana are flat and thin white worms. They were like a ribbon. They are often found in groups in almost all parts of subcutaneous and musculus. The average length is 10cm, with average body width is 0,3cm. This is the first case report of sparganosis infection in *P. mucosus* in Indonesia. The discovery of *P. mucosus* sparganosis is a warning to the public to be more careful and aware in consuming snake because *Spirometra* sp. is one of parasitic zoonoses.

**Keywords:** *Spirometra*, *Ptyas mucosus*, sparganosis.

## 1. Introduction

Snakes are exotic animals that lately many hunted to be traded or just to be a pet. Currently snake is not only limited as performing animals, medicine, food and raw materials factories but also as pets [1]. Wealth of wildlife in Indonesia at the third position in the world in number of reptiles is about 600 species or 16% of reptiles that exist

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in the world and there are 2,700 species of snakes spread throughout Indonesia [2]. One of the famous snakes found in Indonesia is *P. mucosus*. *Ptyas mucosus*, commonly known as the oriental rat snake, Indian rat snake, Bandotan macan or Jali, is a common species of colubrid snake [3]. *Ptyas mucosus* a typical reptile Asia, especially in the Indochina region. In Indonesia *P. mucosus* no longer just used as an exterminator of rats in the rice fields, but the snake is already became famous as pets. *Ptyas mucosus* belongs in one of the many local snake hunted for exported [4]. *Ptyas mucosus* snakes commonly consumed in China and Thailand. Meat and internal organs are used as food or frozen meat, blood and bile are used as traditional medicines and skins are export to several countries in Europe for raw materials factory. However, many communities in rural Indonesia who still eat meat and bile *P. mucosus* for health reasons [4, 5].

Snake is a port of the various parasitic zoonoses and unzoonoses. Worm infection in snake can occur more than one species [1]. In *P. mucosus* frequently reported cases of occurrence sparganosis. Sparganosis is a parasitic infection caused by the larvae *spirometra* or spargana. Sparganosis has been reported in 39 countries in the world, and it mainly occurs in east and South East Asia and has also been reported in Europe, America, Africa, and Australia [6]. Plerocercoid of *Spirometra* or spargana is the agent of human sparganosis and results in blindness, epilepsy, paralysis, and even death [7].

Research about these *spirometra* in *P. mucosus* snakes in Indonesia has not been done. Sidoarjo, East Java is one of the snakes collector which exporting snake products such as meat and skin from East Java to other country. Therefore we need a study of the morphology of *spirometra* in *P. Mucosus* snake in Sidoarjo, East Java.

## 2. MATERIAL METHOD

This research was carried out between of September 2016 - February 2017. The research samples were organs of the *P. mucosus* that killed in snakes collector in Sidoarjo, East Java, Indonesia. When parasites found take it to be collected and identified. Placed parasites into a petri dish and washed with distilled water to clean it then made wet and dry preparations. Parasites of the snake organ identified in the Department of Veterinary Parasitology, Faculty of Veterinary Medicine, University of Airlangga.

Identification adult worm and larvae in wet prepararat using a stereo microscope. Identification with Carmine staining and clearing with Glycerin using a light microscope with a magnification of 40x and 100x.



**Figure 1:** (a) The larvae of *Spirometra* found in subcutaneous. (b) the larva of *Spirometra* length (cm). Arrow to the larva *Spirometra*.



**Figure 2:** (a) Clearing with Glycerin. (b) Carmine staining. The anterior body look wider and tend to be oval.

### 3. RESULT AND DISCUSSION

Sixty snakes were examined in this study, 41 snakes (68%) of positive infected larvae *Spirometra* or called spargana. Spargana found in musculus and subcutaneous snake *P. Mucosus*. Spargana are flat and thin white worms. They were like a ribbon. They are often found in groups in almost all parts of subcutaneous and musculus (Figure 1). On the anterior side of the body look wider and tend to be oval (Figure 2). The average length is 10cm, with average body width is 0,3cm.

In microscopy using clearing with Glycerin and staining Carmine, the anterior side looks larger and on its anterior end formations look like a mouth. Based on the gross and microscopic observations worms were identified as plerocercoid larvae of *Spirometra sp.* or spargana.

Larvae *Spirometra* or spargana is cause of sparganosis in snakes. Sparganosis is a disease of snakes, reptiles and mammals like swine and human. It is caused by migration of second larvae stage (Spargana) of the pseudophyllidean cestode of the genera *Spirometra sp.* Snakes get infected by ingesting infected copepods (first intermediate

host) found in water. Adult tapeworms are seen in the intestine of domestic and wild canids and felids [8]. *Spirometra* sp. a family of Diphyllbothriidae worm parasites, tapeworms can infect domestic animals and humans. This parasite has a complex life cycle that includes three different hosts. *Spirometra* requires two intermediate hosts, first is small crustaceans such as copepods and the second including of tadpoles, frogs, fish, snakes or other reptiles. Carnivores such as birds, dogs, and cats become definitive host *spirometra*, while humans are accidental host that can be second intermediary host or definitive host, because of humans consuming raw infected meat [9, 10].

The adult tapeworm sheds unembryonated eggs that are excreted with the feces, embryonate in the environment, and hatch in water, releasing the coracidia. Oncospheres are ingested by freshwater cyclopoid copepod crustaceans including water fleas and cyclops (the first intermediate host), and later develop into proceroid larvae inside crustacean hosts. Infected with copepods which is then eaten by the secondary intermediate host for example, snakes, and frogs. Inside the vertebrate hosts, proceroid larvae cross the intestinal wall and migrate to organs, where they develop into the second intermediate stage, the plerocercoid larvae. The life cycle is complete when a carnivore eats a secondary intermediate host infected by spargana. In this case, humans become infected due to accidentally consume of intermediate hosts are infected by spargana [10].

Spargana or larvae *Spirometra* have been found in this study has a fairly high prevalence. 68% of snakes that have been researched, more than half snakes infected by spargana. Type of diet commonly consumed by snakes will affect the prevalence of infection spargana. In non-venomous snakes usually infected from consuming frog. *Ptyas mucosus* traded in food markets in China are generally infected by spargana. Spargana most widely found in spread on the musculus, subcutan snakes, and some are found in coelom [6]. Sparganosis infections also reported on two Russel's viper snake from Chennai Snake Park Trust, Guindy, Chennai, India. On gross examination, the worms were found to be flat, solid and creamy white in colour. The spargana found in the subcutaneous tissue of snake [8].

The community's habit of consuming meat raw or half-cooked snake very risky will be infected with spargana. The larvae is very soft and thin, so it is feared some people would underestimate the cleanliness of the snake that will be consumed. Humans become infected with spargana by ingesting undercooked meat of frogs or snakes infected with spargana, drinking water contaminated with proceroid-infected copepods. The human habit of not washing hands thoroughly after handling a frog or snake that once killed can also be a means of infected spargana [8, 9].

Once ingested by a human the spargana larvae undergo visceral migration and can end up in many tissues, where they grow. Subcutaneous sparganosis is the most common form of sparganosis in humans. Spargana which migrates into subcutaneous connective tissue and peripheral muscles, for example the abdominal wall, lower extremity, scrotum, and chest wall. Under the skins of sparganum lesions appear like rubber, irregular lumps or nodules of 1-2 cm long, resembling a lipoma, fibroma, sebaceous cyst or slow, itchy, inflamed, painful, and moving. Some patient's infections going slow, painful, and sometimes the nodules can switch places [11].

Sparganosis has sporadically throughout the world, and a higher prevalence of the disease occurs in several Asian countries, including South Korea, Japan, Thailand, and China [9]. The importance of snakes as main source of human sparganosis in Korea was due to consumption of snakes [8]. In China, there are a lot of cases of human sparganosis caused by eating raw meat of snakes and frogs, drinking snake blood, and swallowing snake gall bladder. Improper cooking methods of snakes will also increase the risk of infection. In addition, *spiroметра* may contaminate tableware and food in the process of cooking snake meat. In 2011, also found bronchial sparganosis on someone who was fond of eating raw snakes and frogs, and drink the fresh blood of the Snake [5, 6]

#### 4. CONCLUSION

On the research of *Spirometra* larvae has been found on the snake *P. mucosus*. Larvae of *Spirometra* found on the musculus and subcutaneous *P. mucosus*. Spargana are white flat and thin worms. They were ribbon like which may reach several cm in length. They are often found in groups on almost all parts of the subcutaneous and musculus. This is the first case report of sparganosis infection in *P. mucosus* in Indonesia. Humans become infected with spargana by ingesting raw meat or undercooked meat of frogs or snakes infected with spargana, drinking water contaminated with proceroid-infected copepods. The discovery of *P. mucosus* sparganosis is a warning to the public to be more careful and aware in consuming snake because *Spirometra* sp. is one of parasitic zoonoses.

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