

Conference Paper

Morphological Identification Nematodes *Tanqua tiara* Found on Gastric *Varanus salvator* at East Java

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Abstract

Tanqua tiara (*T. tiara*) is the gastric nematode of *Varanus salvator* (*V. salvator*) [1-4], this study was conducted to identification morphology of *T. tiara*. Although there are no reports of human and animal infection *T. tiara* but still have the potential to transmit the disease to humans through direct contact or indirectly. Isolation of adult worms *T. tiara* from the digestive tract of *V. salvator* and then will make to dry preparat. Some 20 *V. salvator's* gastrointestinal tract at autopsy and gained as much as 321 nematode worms, nematode worms were obtained from the stomach *V. salvator*, result identification from dry preparat show : Male (mm) (Total length of body 9.4-32, Wide body 0,26-1,77, Diameter of head-bulb 0,17-0,32, The length of the head 0,23-0,33, Distance from the head-end to the end of the esophagus 2,8-5,7, Distance from the head-end to cervical sac 0,22-0,81, The thickness of the cuticle 0,008-0,036, Long tail 0,13-0,42, Long spikulao,3-1,1) and female (mm) (Total length of body 6,8-22, Wide body 0,14-2,33, Diameter of head-bulb 0,15-0,34, The length of the head 0,1-0,28, Distance from the head-end to the end of the esophagus 2,3-4,58, Distance from the head-end to cervical sac 0,18-0,88, The thickness of the cuticle 0,007-0,031, Long tail 0,12-0,28, Distance vulva from the tail end 3,02-3,61, Long uterus 13,1-21,4, size of egg 0,04-0,052X0,03-0,049). Identification of morphological *Tanqua tiara* indicate worms vary in size, but the specimen is dominated by small-sized worms.

Keywords: *Varanus salvator*; *Tanqua tiara*; Cephalic bulb.

1. Introduction

Tanqua tiara (*T. tiara*) is the gastric nematode of *Varanus salvator* (*V. salvator*) [1-4], this worms first identified by [5] as *Ascaris tiara* and enhanced being genus *Tanqua* by [6].

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The *Tanqua* has close ties with *Gnathostoma* that included *T. tiara*, Gnathostomatidae family [7]. The identification results by [8] Baylis and Lane (1920) was used to review the complete identification that is done by [6], 71 years later do research identifying repeated by [9], the findings of the identification of the shows worms have a smaller size, morphological differences have a close relationship between parasite and host, host adaptation against environmental changes will take effect against the parasite morphology [10].

Environment of *V. salvator* that being around the water like swamps, drains/sewers and ponds causes the worm to the *V. salvator* easily infect host between such as shrimp, fish, eels, birds, frogs and likely able to infect mammals that drink water contaminated by worm eggs *T. tiara* out with feces, although there are no reports of human infection *T. tiara* but all species have the potential to transmit disease to humans through direct contact or indirectly [11] (Soeharsono, 2004), it is feared worm *T. tiara* can infect humans, saw the approaching *V. salvator* with humans is possible infectious agents infecting humans, currently used as a *Varanus* pets, consumption and for traditional medicine [12].

In the year of 1938 in Hainan, China at the animal rescue center reported many *V. salvator* death, one of the causes of these deaths because of infestations of nematodes *T. tiara*, the cause of death of *V. salvator* be important to consider in order to protect healthy reptiles [13]. According to the research [14] of 399 *V. salvator* studied in North Sumatra, all tested positive for *T. tiara* infected nematodes, in addition found in *V. salvator*, *T. tiara* is also found in snakes *Lycodon laoensis* in Thailand, this worm infects *Varanus* spp from Africa to Southeast Asian habitat in fresh water and sea water [15].

2. Materials and methods

2.1. Sample

The population used in this study is *Varanus salvator* (*V. salvator*) were sacrificed at the scene. Samples from this study are adult worms *Tanqua tiara* obtained from the gastric *Varanus salvator*.

2.2. Isolation of adult worms *Tanqua tiara*

The digestive tract of *V. salvator*, will find at *V. salvator* sacrificed at the scene, the adult worm *T. tiara* obtained from the gastrointestinal tract *V. salvator*, then the worm

to be incorporated into a petri disk and washed with distilled water until clean, worms obtained partially crushed, became dry preparat and partly kept as a specimen.

2.3. Identification of worms *Tanqua tiara*

Adult worms will press between two glass object by an object placed on the glasses and glasses clamped with other objects using a rope tied not too tight on the left and right ends of glass objects. Worms soaked in a solution of glycerin 5% alcohol for 24 hours up. Results immersion in alcohol glycerin is taken, then put in 70% alcohol for five minutes. Object beaker containing worms were transferred to a solution of Carmine diluted and leave to infuse for about eight hours depending on the thickness of thin thickness of the cuticle of the worms, then the worm that has been stained released from fixation and entered into acid alcohol for two minutes, then transferred alcohol into the base for 20 minutes, after the process of worms put in alcohol 70%, 85% and 95% respectively for five minutes consecutively. Mounting is done in a solution of Hung's first for 20 minutes, then the worms taken from Hung's first solution and placed on clean glass objects. Hung's solution II drop sufficiently above the worms and covered with a glass cover. Mixture worms that have permanent then dried in an incubator at 37°C, after which it was placed at room temperature for the cooling process to be ready for process identification. Mixture worm that has been prepared can be identified using a microscope with a magnification of 40x and 100x, worms that have been obtained and identified by identification keys [16].

3. Results

Morphological differences due to the effects of weather and environmental change (global warming) [17]. The big difference in habitat affects the amount of food and nutrients are obtained, the amount of food availability and mangrove river environment very much [18]. One of the specimens [19] obtained from *Varanus bengalensis* is a place of life in the areas near the river and specimens obtained [20] of *Varanus niloticus* in mangrove habitats while *V. salvator* in this study was obtained from the pond.

The difference in total length worms by [21] is one indication of the different species. The big difference in the length of the worm can be influenced also by the old rate of infection in the host, the longer the worm infects a host, the worm will be more mature and long [22].

TABLE 1: The results of the morphological identification of *T. tiara* worm by sex can be seen in the table below.

	Male worm (mm)		Female worm (mm)	
	Total length	X±SD	Total length	X±SD
Total length of body	9,4-32	18,6±8,72	6,8-22	12,2±5,0
Wide body	0,26-1,77	0,66±0,53	0,14-2,33	0,6±0,6
Diameter of head-bulb	0,17-0,32	0,25±0,07	0,15-0,34	0,21±0,07
The length of the head	0,23-0,33	0,26±0,03	0,1-0,28	0,15±0,05
Distance from the head-end to the end of the esophagus	2,8-5,7	4,2±1,16	2,3-4,58	3,18±1,08
Distance from the head-end to cervical sac	0,22-0,81	0,37±0,2	0,18-0,88	0,33±0,2
The thickness of the cuticle	0,008-0,036	0,022±0,0117	0,007-0,031	0,023±0,0283
Long tail	0,13-0,42	0,28±0,13	0,12-0,28	0,19±0,06
Long spikula	0,3-1,1	0,63±0,29	-	-
Distance vulva from the tail end	-	-	3,02-3,61	3,31±0,42
Long uterus	-	-	13,1-21,4	17,25±5,87
Size of egg	-	-	0,04-0,052 × 0,03-0,049	-

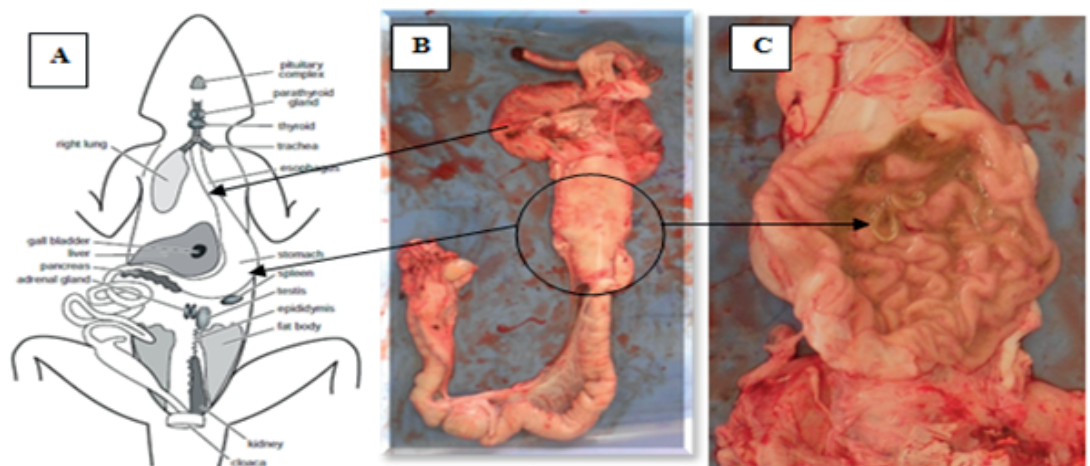


Figure 1: Worms in the digestive tract *Varanus salvator*. Description: A picture of gastrointestinal and endocrine channel *Varanus* spp (Vitt and Caldwell, 2009). Figure B. *V. salvator* digestive tract. C. Pictures of nematodes that exist in the stomach *V. salvator*.

Long nematodes can also be affected by a life of host definitively if the hosts definitively live in shallow waters, the size of the nematodes will be longer than the host definitively that live in deep water, this happens because of differences in food supplies, oxygen and minerals in water [23].

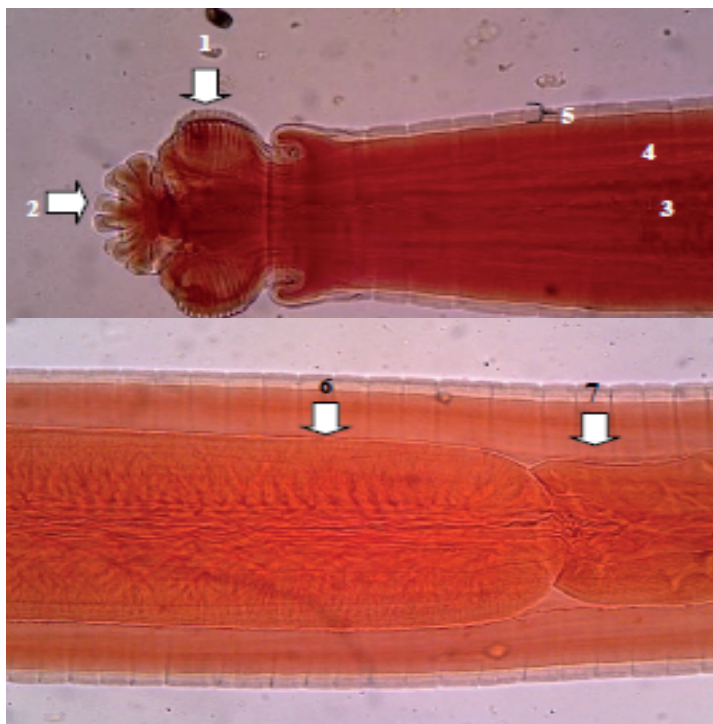


Figure 2: The anterior part of the worm *Tanqua tiara* Description: Anterior worm *T. tiara* with a magnification of 100X, 1. Cephalic bulb, 2. Pseudolabia, 3. esophagus, 4. Cervical sacs, 5. Cuticle, 6. Esopagus, 7. Intestine.

Spicules used as a taxonomic character, shape and size of the hard spicules observed with a light microscope, measuring the length and shape of spicules more objective when observed using transmission electron microscopy and scanning electron microscopy [24]. The layout of the vulva is shorter, the position is different in each species vulva, vulva position is between anterior and posterior of the body, the vulva is very helpful in understanding both at the genetic and taxonomic species [25]. The vulva is a good system to study evolution because of the formation of the vulva is well known from the cellular, genetic and molecular level [26].

20 gastrointestinal tract *V. salvator* at autopsy and gained as much as 321 nematodes worm, nematodes worm were obtained from the stomach *V. salvator*. The worms then identified one by one in accordance with identification keys according to [16]. Dried preparations were made from 25 worms, dry preparations are used for identification of morphology associated with gender, body size, shape and ovarian spicules.

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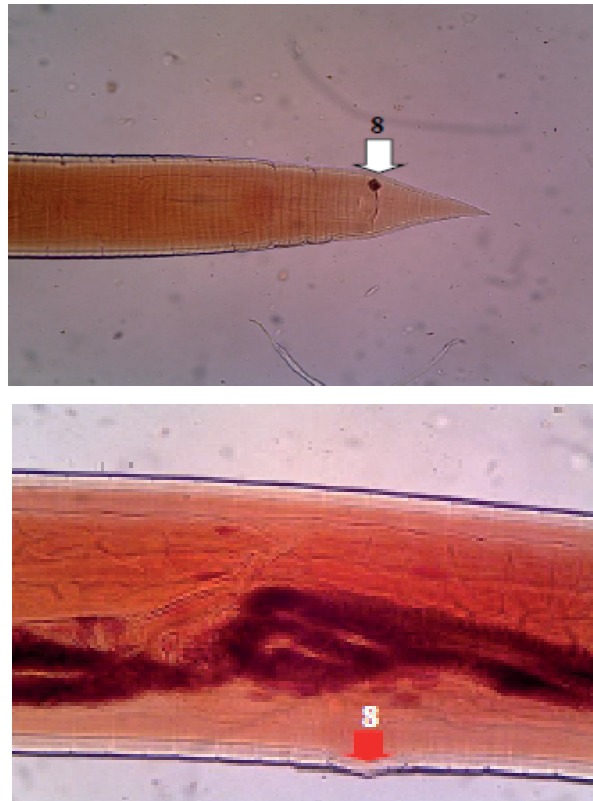


Figure 3: The posterior part *Tanqua tiara* magnification 100X. Description: 8. Vulva.

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Figure 4: The posterior part of the male worm *Tanqua tiara* 100X magnification. Description: 9. spicules.

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