

Gnathostoma and gnathostomiasis *in* Champasack Province, Southern of Laos



Present by:

Youthanavanh Vonghachack , Paron Dekumyoy, Tippayarat Yoonuan,
Surapol Sa-nguankiat, Supaporn Nuamtanong, Urusa Thaenkham,
Bounlay Phommasack, Jun Kobayashi, Jitra Waikagul

Faculty of Medicine, University of Health Sciences, Lao PDR

Department of Hygiene and Prevention, Ministry of Health, Lao PDR

Department of Helminthology, Faculty of Tropical Medicine, Mahidol University, Thailand

International Medical Center of Japan, Ministry of Health, Labor and Welfare, Japan

Introduction



- ✚ Asian countries have long been described as endemic areas of **gnathostomiasis** *including* Thailand, Japan, Korea, Malaysia, **Laos**, Myanmar, Vietnam and Taiwan...
- ✚ Recently, Mexico and Ecuador were also reported to have endemic foci



Gnathostomiasis in Lao PDR

Gnathostomiasis cases involve Lao PDR

Year	Nationality	Country living	No. case	Description
1975	Laotian	Laos	2	Expectorated worm, 32% Eo, migratory subcutaneous swollen <i>and</i> No symptom, incidental finding of lesion of terminal ileum during leiomyoma resection
1996-97	Laotian	Laos	2	Pakngeung, Xaysetha District, Vientiane Capital, worms migrated out spontaneously on her breast <i>and</i> another one on her gum. (<i>G. spinigerum</i> , by KKU)
2003	French	France	1	traveled in Laos, <i>+/immunoblot</i>
	Laotian	France	1	<i>+/immunoblot</i>
	Laotian	France	1	presented 6 years recurrent swelling, <i>+/immunoblot</i>
	German	Germany	1	traveled in Laos/Cambodia, high Eo., recurrent swelling, <i>+/immunoblot</i>
2004	Laotian	Germany	1	17% eosinophilia, swelling of knees, <i>+/immunoblot</i>
2005	Laotian	Laos	35	Thesis study of IFMT, in 5,266 people enrolled, 35 cases <i>+/signs&symptoms+ Eo > 5%, prevalence: (0.66%)</i>
2006	Laotian	Canada	1	recurrent swellings of right forearm for 1 year <i>+/immunoblot</i>
2006	Laotian	Germany	1	visited Laos, left cheek swelling, <i>+/immunoblot</i>

Objectives

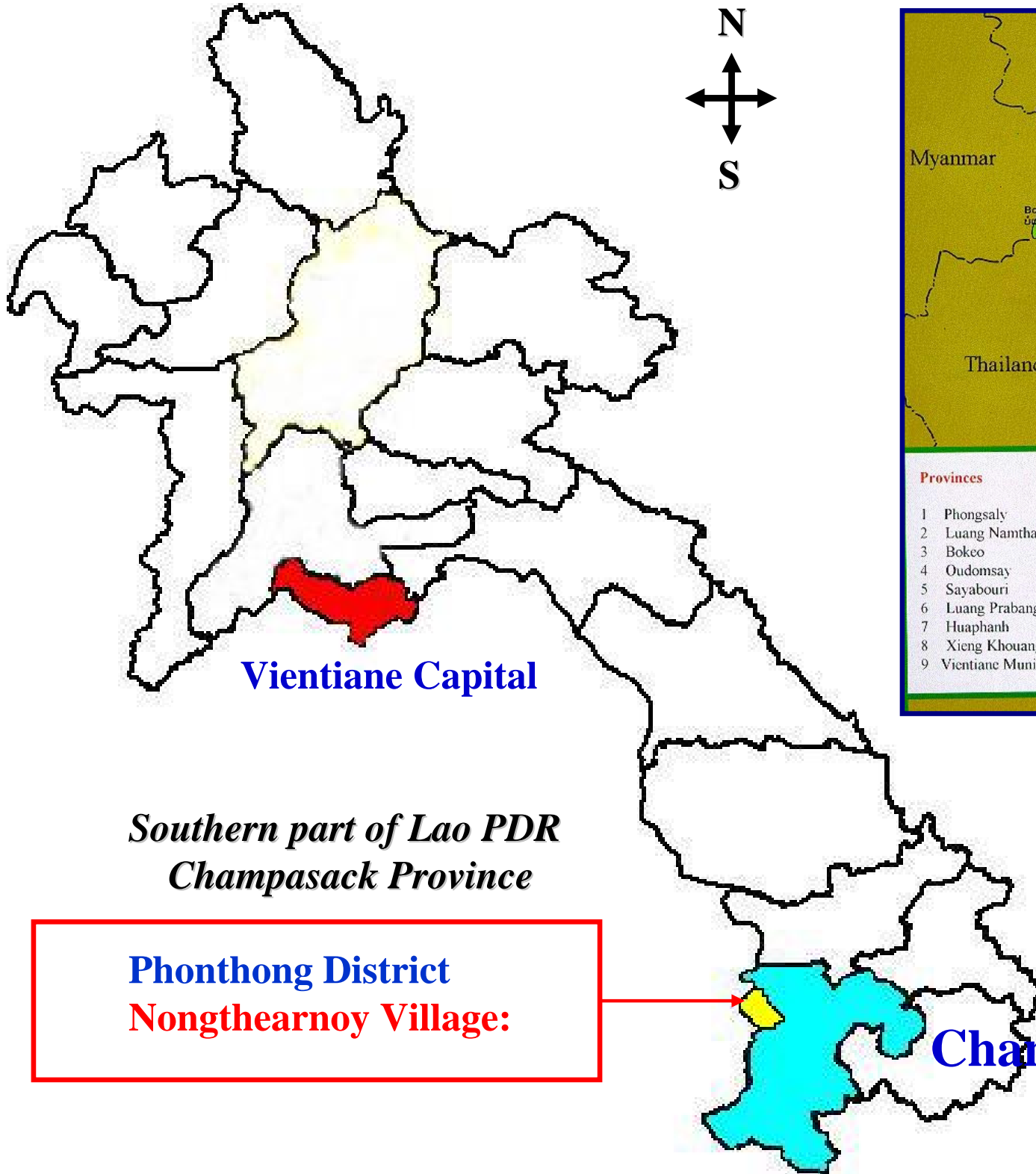


This study aimed to investigate

- ✚ **Gnathostomiasis prevalence and hosts of *Gnathostoma* in Nongthearnoy Village, Phonthong District, Champasack Province**

Study Area and Population

- ✚ This study is part of the project on *Gnathostoma* and gnathostomiasis in Lao PDR
- ✚ Selection of study area based on sero-screening of suspected cases from **provincial and district hospitals**
- ✚ *Southern part of Lao PDR, Champasack Province*
Phonthong District
Nongthearnoy Village:
8 Km from Pakse District
131 participants in this study (*random sampling*)
10-70 years old



Vientiane Capital

*Southern part of Lao PDR
Champasack Province*

**Phonthong District
Nongthearnoy Village:**



Champasack Province

Materials and Methods



✚ Cross-sectional study

✚ Data collection

➤ *Serum collection: (Immunoblot analysis)*

✓ Hospital-based study:

Sero-Screening in provincial and district hospitals

✓ Community-based study:

Serum collection in the target village

➤ *Stool collection: Conducted in the village (Kato-Katz)*

Materials and Methods

➤ *Definitive and intermediate hosts collection:*

✓ Definitive host: (*Kato-Katz*)

Dropped stool of definitive host (dog) were collected from target village

✓ Intermediate host: (*Compression method*)

2nd intermediate hosts were collected from target village and markets (*Fish, swamp eel, frog*)

➤ *Questionnaire: (Interviewing)*

➤ *Treatment: Albendazole 400 mg once daily for 3 weeks.*



Result

Characteristics of studied population

	Male (n=69)(%)	Female (n=62)(%)	Total (n=131)(%)
<u>Age (years)</u>			
<i>Mean (age range)</i>			39.1 (11-68)
<u>Ethnic group</u>			
<i>Lao-loum</i>	69 (52.7)	62 (47.3)	131 (100)
<u>Educational level</u>			
<i>Illiterate</i>	5 (3.8)	12 (9.1)	17 (12.9)
<i>Primary school</i>	45 (34.3)	35 (26.7)	80 (61.0)
<i>Secondary school</i>	15 (11.5)	14 (10.6)	29 (22.1)
<i>High school</i>	4 (3.0)	1 (0.8)	5 (3.8)
<u>Occupation</u>			
<i>Agriculturist</i>	61 (46.6)	58 (44.2)	119 (90.8)
<i>Government employee</i>	4 (3.0)	1 (0.8)	5 (3.8)
<i>Pupil</i>	4 (3.0)	3 (2.3)	7 (5.3)

Sera analysis

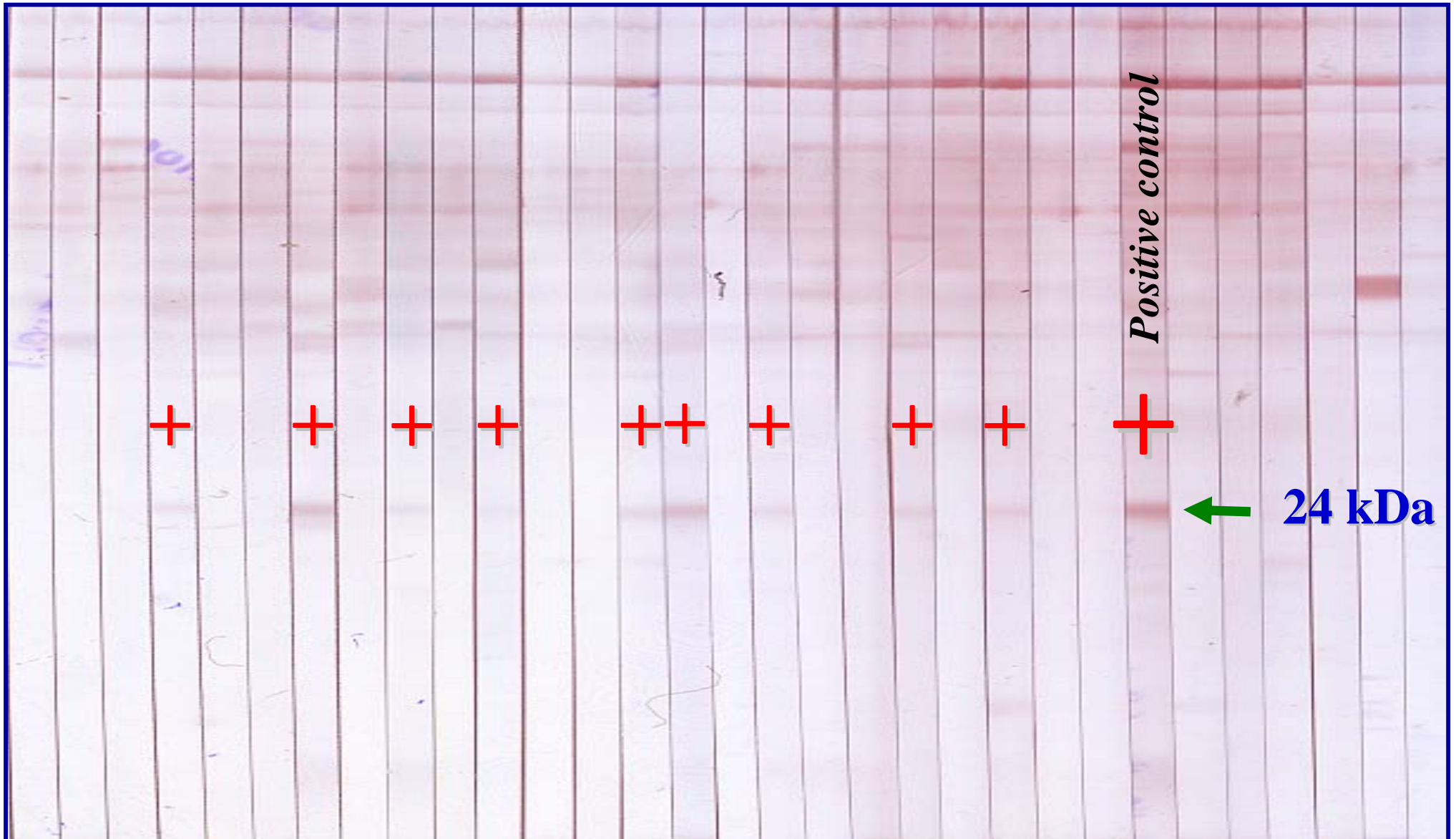
✿ *Immunoblot technique*

✚ Using ***GsAL3*** crud antigen

✚ The diagnostic band is **24 kDa**

Sera analysis

✿ *Immunoblot technique*



Sera analysis

* *Immunoblot technique*

Prevalence of human gnathostomiasis

Village	No. of examined	<i>Gnathostoma</i> infection (%)	
		Male	Female
Ban Nongthearnoy	131	31 (23.7)	20 (15.2)
<i>Total</i>	<i>131</i>	<i>51 (38.9)</i>	

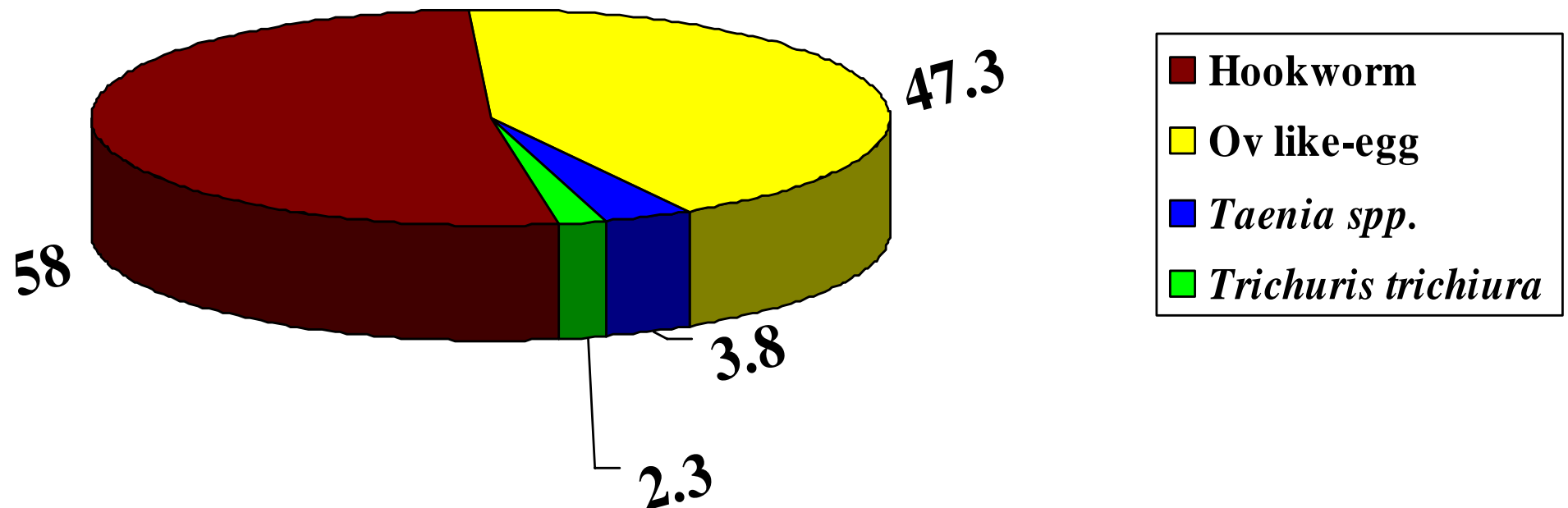
Consumption habit and gnathostomiasis

Consumption	Eating raw/undercooked Yes (%), <i>n</i> = 131	Immunoblot analysis	
		Positive	Negative
Fermented fish	130 (99.2)	51	79
Unboiled water	129 (98.5)	51	78
Fish	121 (92.4)	51	70
Pork	120 (91.6)	49	71
Beef/buffalo meat	106 (80.9)	46	60
Chicken/bird meat	0	51	80
Swamp eel	0	51	80

Other helminthic infections

✿ *Kato-Katz technique*

131 participants were enrolled



Intermediate

host study

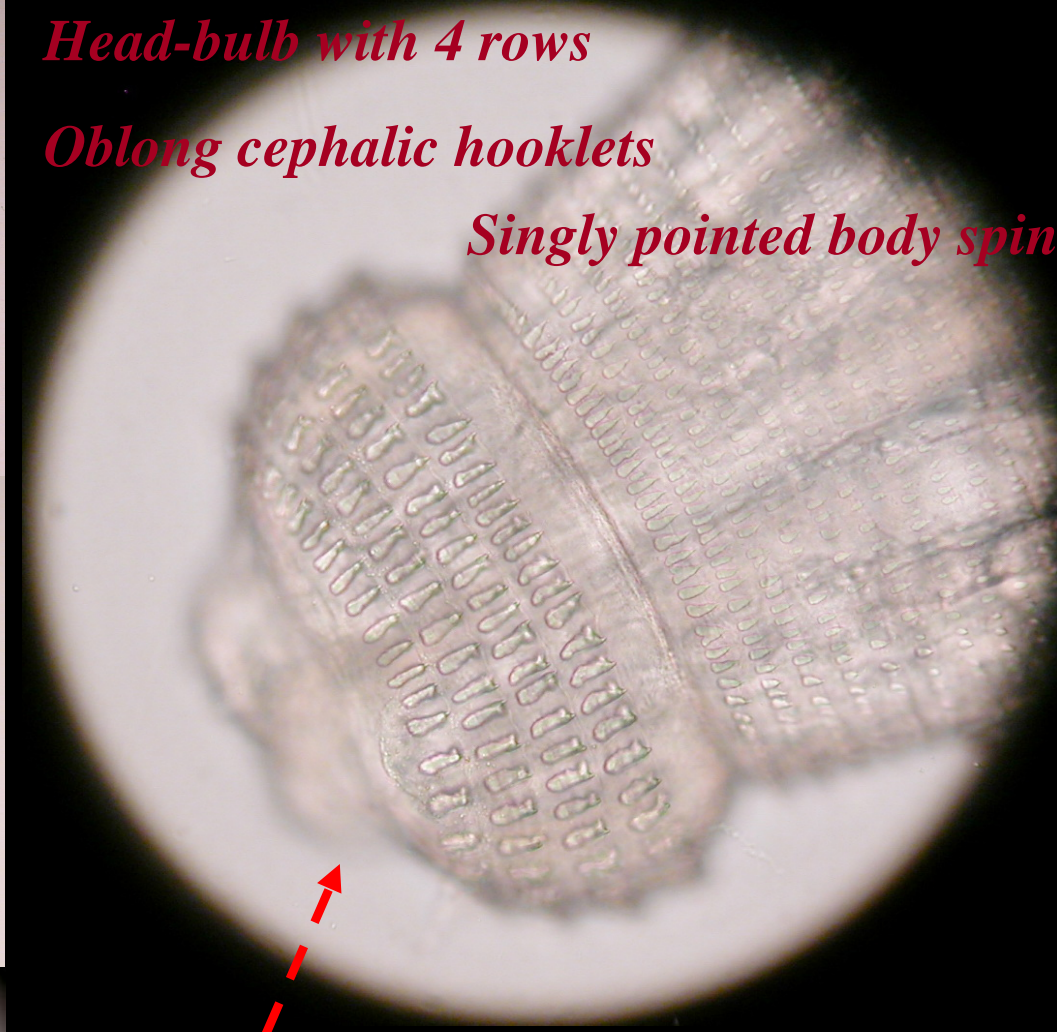
✱ *Compression technique*

Intermediate hosts	Central market (%)			Village (%)		
	No. exam.	GsAL3	<i>Spirometra</i> larvae	No. exam.	GsAL3	<i>Spirometra</i> larvae
Frog	28	0	9 (32.1)	16	3 (18.7)	10
Swamp eel	26	2 (7.6)	1 (3.8)	0	0	0
Cat fish	12	0	0	1	0	0
Snake-head fish	7	1 (14.2)	0	1	0	0

Head-bulb with 4 rows

Oblong cephalic hooklets

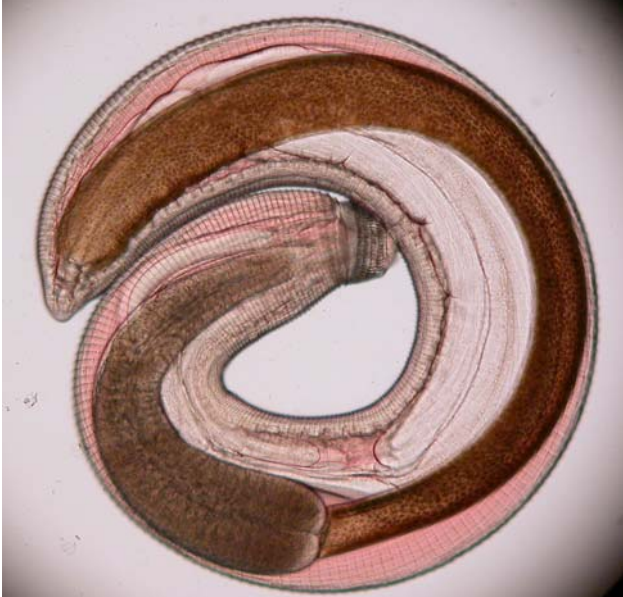
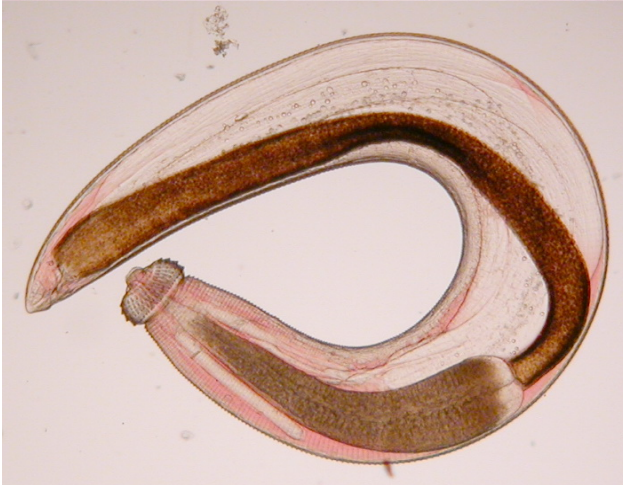
Singly pointed body spine



GsAL3 obtained from frogs in the village

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Gnathostoma egg in dog feces

Normal saline



Single plug

Normal saline



Kato-Katz



*14 dropped stools of dogs
were collected
from the village*

▣ *Gnathostoma* eggs (**2/14; 14.3%**)

▣ Hookworm eggs (**14/14; 100%**)

▣ *Spirometra* eggs (**10/14; 71.4%**)

Clinical finding in 51 positive cases

- All **51** sera positive of 24 kDa-diagnostic band are asymptomatic, **no acute gnathostomiasis during study** (*all had history of raw fish and unboiled water consumption*)
- **3** cases had previous symptoms;
 - *creeping eruption on his leg (One month ago)*
 - *left arm swollen with pitting pain (One year ago)*
 - *creeping eruption on her trunk, then 2 weeks later a worm migrated out of her abdomen (10 years ago)*

Conclusion

- ✦ The result confirms that Nongthearnoy village is an endemic area of gnathostomiasis in Champasack Province
- ✦ Transmission occurs in the village, dog is a reservoir host and frog is one of the source of infection to human (*Complete life cycle*)
- ✦ This is the first endemic area of gnathostomiasis demonstrated in Lao PDR with high sero-prevalence (*38.9%*), *reservoir host (14.3%) and frog intermediate host (18.7%)*
- ✦ Asymptomatic gnathostomiasis are noted for further study
- ✦ Immunodiagnosis is necessary for human gnathostomiasis
- ✦ More study is needed in other provinces before distribution of gnathostomiasis inside Lao PDR is clearly understood and control policy can be established.

Acknowledgements



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Collaboration



- ✿ **Faculty of Medicine, University of Health Sciences,
MoH Lao PDR**
- ✿ **Department of Hygiene & Prevention,
MoH Lao PDR**
- ✿ **Department of Helminthology, Faculty of Tropical
Medicine, Mahidol University, Thailand**
- ✿ **International Medical Center of Japan, MoHLW**



Thank you

very much