

Paragonimiasis in Kasy District Vientiane Province, Lao PDR

Present by:

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Paragonimiasis in Laos

- * **In 1947**, the first paragonimiasis case of Laos (Kirkley *et al.*, 1973).
 - from hill tribesmen in Sam Neua District, Houaphan Province
 - along the North Vietnamese border

- * **In 1968**, **8 cases** of paragonimiasis (Sackpraseuth *et al.*, 1969).
 - from Mahosoth and Military Hospitals in Vientiane Capital

- * **In 1969**, **54 cases** from a total of **1600 patients** admitted, Mahosoth Hospital, Vientiane Capital (Coudert *et al.*, 1971)
 - The patients came from **6** provinces: Luangprabang, L-Namtha, Xiengkhuang, Khammuan, Pakse, Vientiane province.
 - *Paragonimus heterotremus* adult worm was identified from autopsy

- * **In 1973**, the first nation wide of epidemiological investigation on *Paragonimus* infection in Laos was conducted (Soh C.T *et al.*, 1973).
 - skin test of *Paragonimus westermani* antigen.
 - with **1,531** people from **15** provinces
 - **151** people (**9.8%**) gave positive reactors
 - Only **22** active cases were found in the following provinces: Savannakhet, Vientiane, Xiengkhouang, Phong Saly, Saravanh (Sedone), LuangPhrabang and Houa Phanh

Paragonimiasis in Laos (con't)

- * **In 2001 and 2002**, *Institut de la Francophonie pour la Médecine Tropicale (IFMT)*, Vientiane Capital, Laos
 - **3 and 24 cases** from Nambak District, Luangprabang Province (L.P)

- * **In 2003** the *IFMT team* conducted the Epidemiology on Paragonimiasis in Hinheub District, Vientiane Province
 - **118 sputa in 3 villages**
 - **17 people (14%)** were positive with eggs of *Paragonimus* sp.

- * **In 2003**, Parasitology Unit at Faculty of Medical Sciences, National University of Laos conducted a survey on Paragonimiasis in Nambak District, L.P (*Vongsouvan et al., unpublished*)
 - **335 sputa in 6 villages**
 - **6 cases (1.79%)** were positive with eggs of *Paragonimus* sp.

This Research

- * **Epidemiological Study on Paragonimiasis in Kasy District, Vientiane Province**

- * ***Stool, sputum and crabs examination***
 - * ***January 2006*** in **4** villages (Namken, Phonsyda, Chieng and Phouhinlecfay villages) ***and*** Ban Chieng Primary and Secondary Schools

- * ***Serum collection***
 - * ***August 2006*** in **2** villages (Namken and Phouhinlecfay villages) ***and*** Patients from Kasy hospital (Kasy District)
 - * **Vientiane Province and Phon Hong hospitals (Phon Hong District)**

Objectives

The *aim* of this study was to *investigate*:

- ✧ **Paragonimiasis in Kasy District, Vientiane Province**
- ✧ **Prevalence of *Paragonimus* spp. metacercariae in mountainous crabs**
- ✧ **Sero-prevalence survey in potential endemic areas from village and patients in Hospitals, Vientiane Province**

Study site

- ✧ **Kasy District, Vientiane Province**
 - ✧ North of Lao PDR (*Figure*)
 - ✧ hilly and mountainous region
 - ✧ about **213** km North of Vientiane capital
 - ✧ Population is **27,510** people
 - ✧ **59** villages with **3** major ethnic groups.
 - ✧ Lao-Lum (**47,2%**)
 - ✧ Lao-Theung (**47,6%**)
 - ✧ Lao-Soung (**5,1%**)

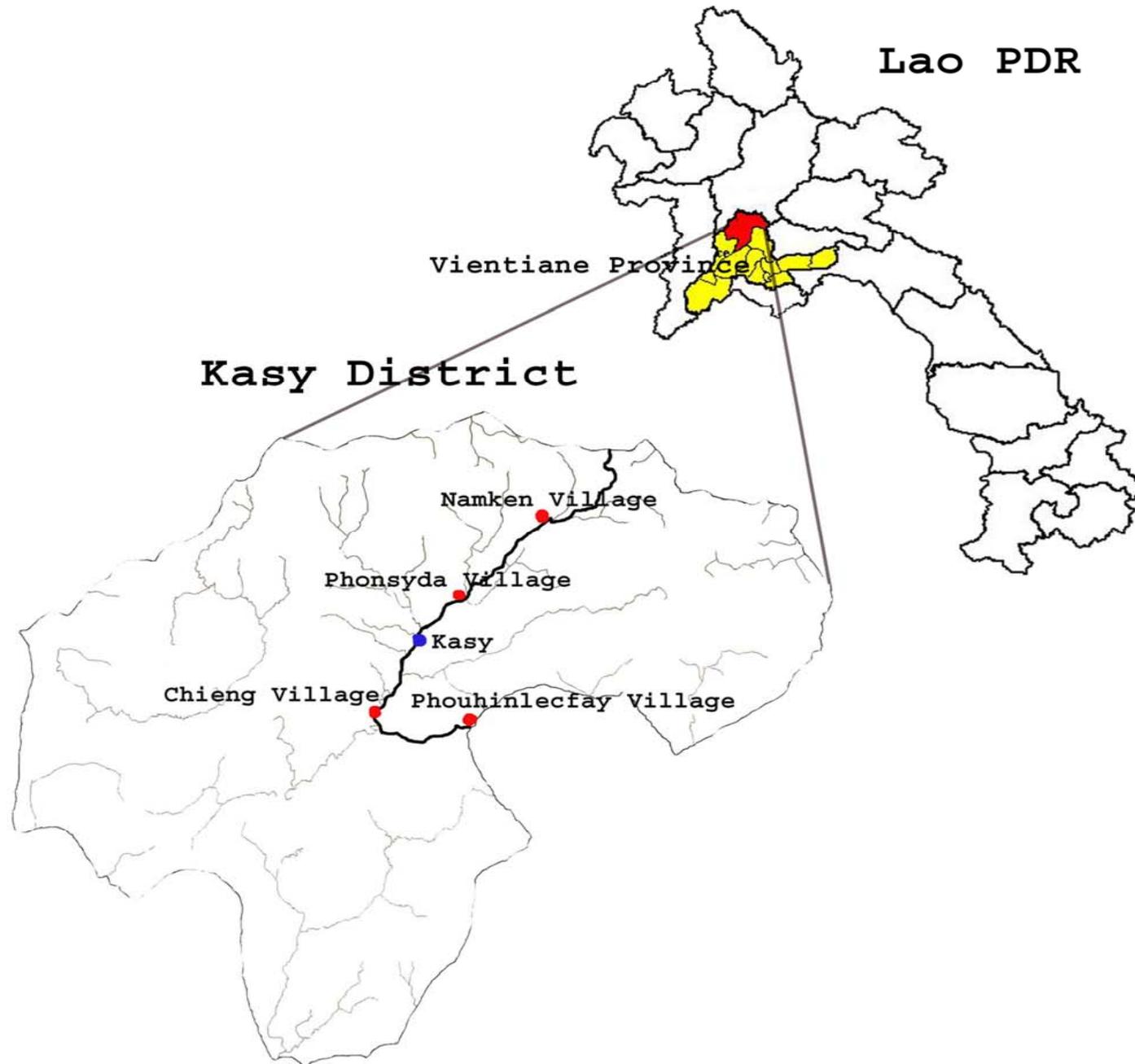
Kasy District



Vientiane Province



Lao People's Democratic Republic



Ban Chieng's **Primary and Scondary Schools**



Water Resource of NamKen Village



Meeting with villagers in Phouhinlecfay Village



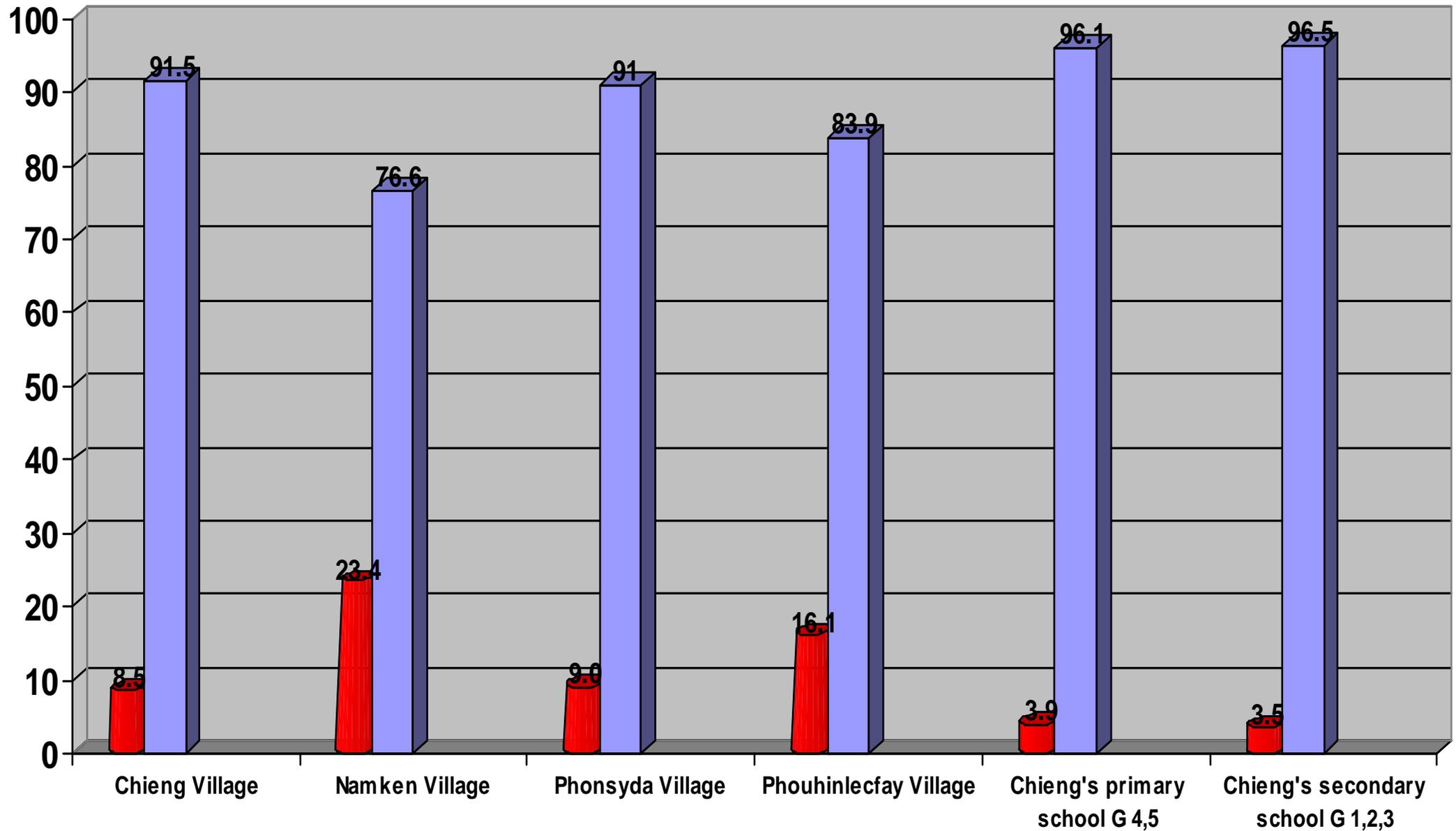
**Water
system
from
mountain
stream**

Characteristics of studied population in Kasy District, (2006)

	Male (%) (n=271)	Female (%) (n=276)	Total (%) (n=547)
<u>Age (years)</u>			
<i>Mean (age range)</i>			<u>22.9 (5-80)</u>
Adult	125 (22.8)	123 (22.4)	<u>248 (45.3)</u>
Schoolchildren	170 (31.1)	154 (28.2)	<u>324 (59.3)</u>
<u>Ethnic group</u>			
<i>Lao-loum</i>	182 (33.2)	195 (35.7)	377 (68.9)
<i>Lao-theung</i>	89 (16.2)	81 (14.9)	170 (31.1)
<u>Educational level</u>			
Illiterate	24 (4.4)	65 (11.9)	<u>89 (16.3)</u>
<i>Can read and write a little</i>	32 (5.9)	20 (3.7)	52 (9.5)
<i>Primary school</i>	22 (4.0)	29 (5.3)	51 (9.3)
<i>Secondary school</i>	15 (2.7)	9 (1.6)	24 (4.4)
<i>High school</i>	8 (1.5)	0	8 (1.5)
<u>Profession (exclu. schoolchildren)</u>			
<i>Government employee</i>	6 (1.1)	0	6 (1.1)
Farmer	81 (14.8)	106 (19.4)	<u>187 (34.2)</u>
<i>Trader</i>	0	4 (0.7)	4 (0.7)
<i>No work</i>	14 (2.6)	12 (2.2)	26 (4.8)

Crab consumption habit in surveyed areas, Kasy District (2006)

■ Used to eat raw crab ■ Never eat raw crab



Common crab dish



Roast crab



Roast crab



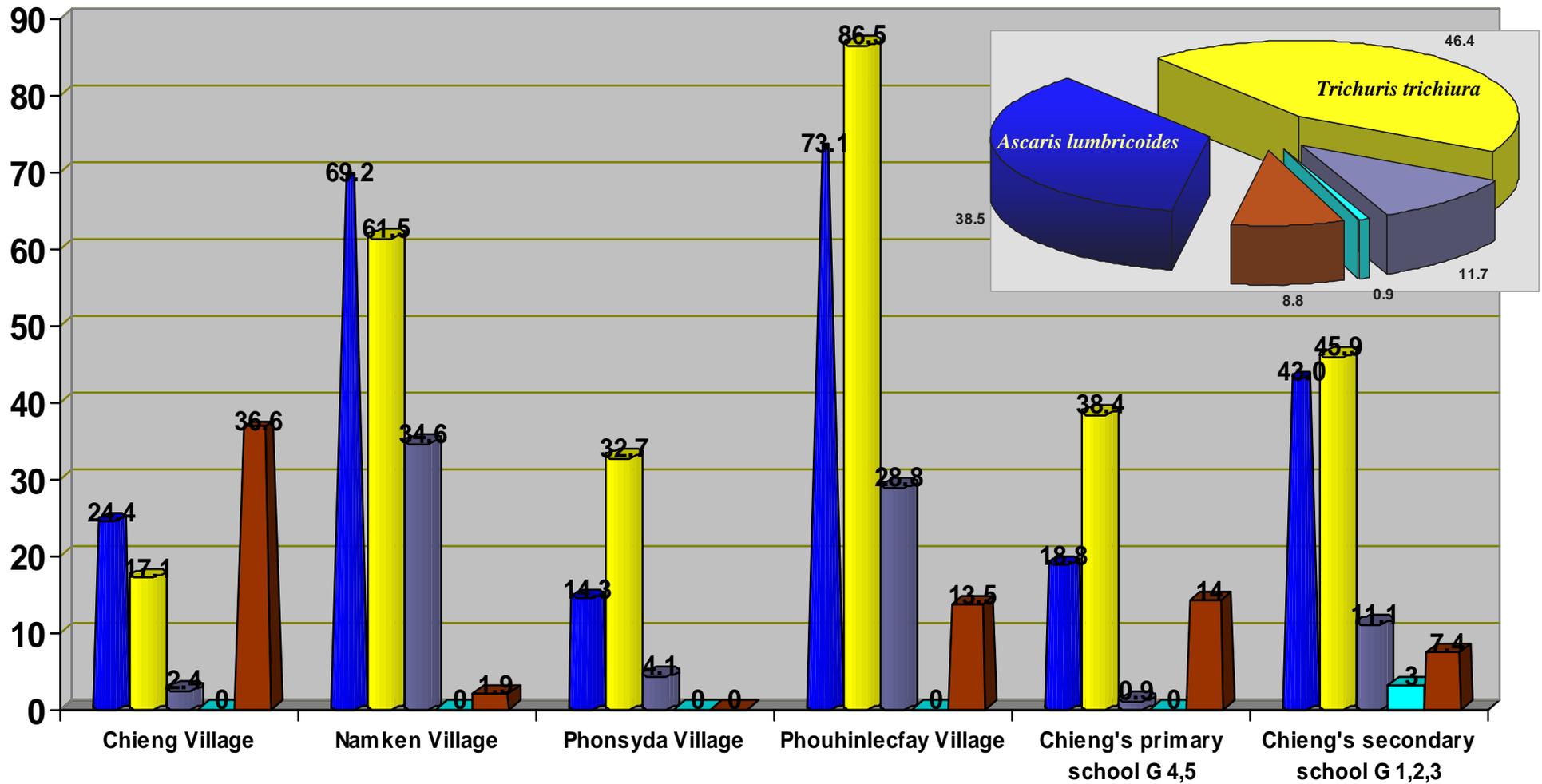
Cooked crab food

Stool examination ** KATO technique.*

Prevalence of *helminth* and *Paragonimus sp.* infection rates in Kasy District (2006)

** No egg-positive of Paragonimus sp. in 441 stool samples*

■ *Ascaris lumbricoides* ■ *Trichuris trichiura* ■ Hookworm ■ *Enterobius vermicularis* ■ Small trematode egg



Sputum examination



Concentration *method*

- * *In January 2006,*
- * **547** sputum samples were examined
- * **Could not found egg of *Paragonimus* sp. in sputum**
- * **Bloody sputum was not observed from the residents**

Sputum examination

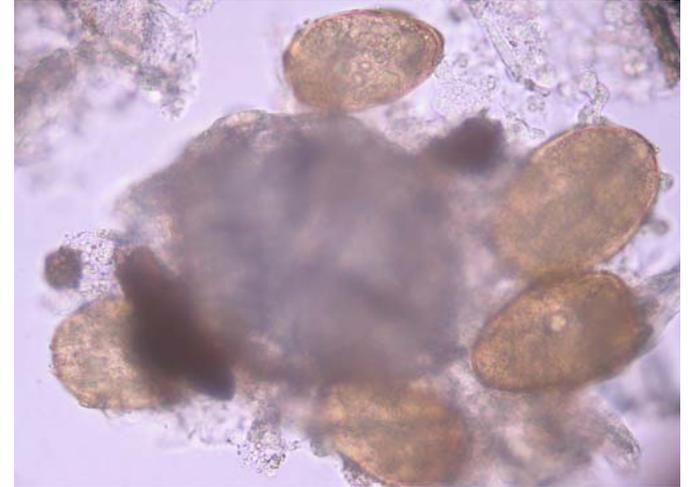
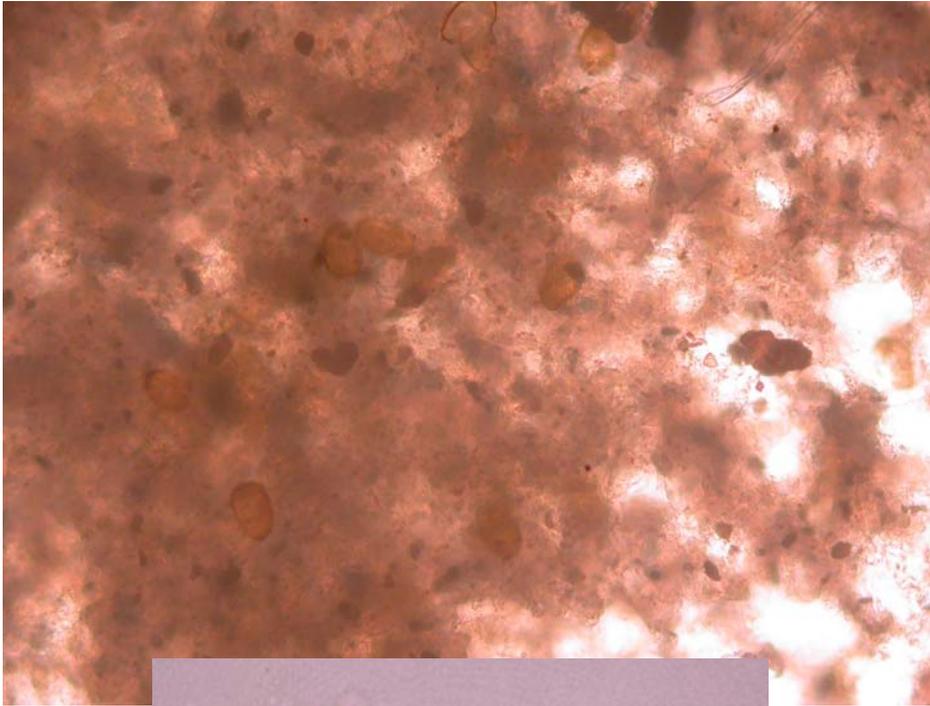
* Concentration *method*

* *In August 2006,*

* **1** hemoptysis patient had *sputum positive* with eggs of *Paragonimus* sp. in Namkane Village, Kasy District, Vientiane Province.

* Another **1** hemoptysis patient **admitted** in Vientiane Province hospital had *sputum positive* with eggs of *Paragonimus* sp. in Phon Mouang Village, Hinheub District, Vientiane Province.

Paragonimus eggs in sputum



Crab examination

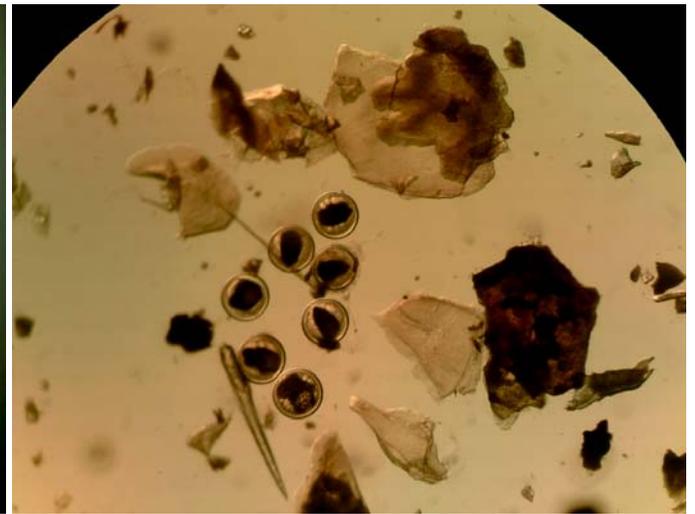
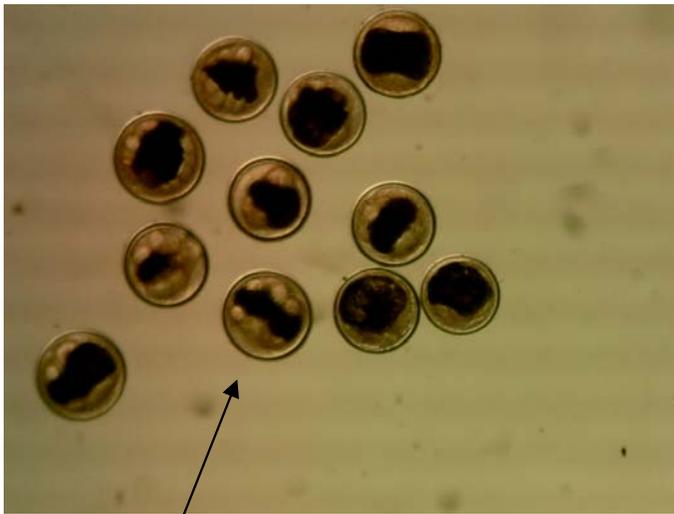


Digestion *method*

Paragonimus metacercariae from crabs in Kasy District, (2006)

Collection site	No. of crab examined	Crab with <i>Paragonimus</i> sp. metacercariae		Total Positive (%)
		<i>P. westermani</i>	<i>P. heterotremus</i>	
Ban Chieng:				
<i>NamKouy stream</i>	54	9	1	<u>10 (18.5%)</u>
Ban Namken:				
<i>Namphou stream</i>	32	2	1	<u>3 (9.4%)</u>
<i>PhaBen stream</i>	7	0	0	0
Ban Phonsyda:				
<i>Yek stream</i>	33	0	0	0
Ban Phouhinlecfay	37	0	0	0
Kasy market	42	2	0	<u>2 (4.8%)</u>
PhaHom market*	25	0	0	0
Total	230	13	2	15(6.5%)

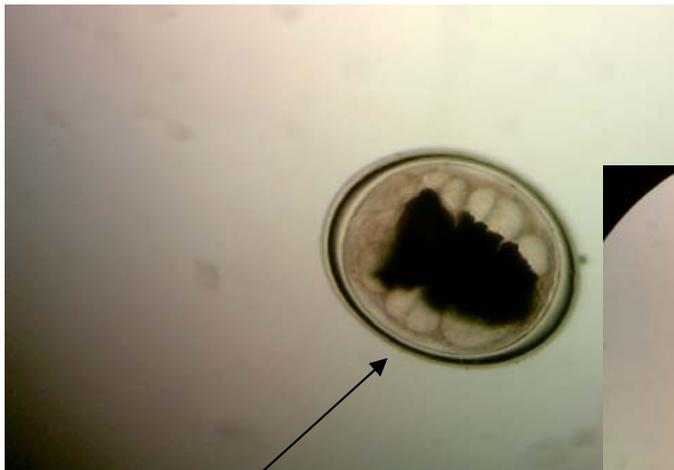
Paragonimus metacercariae



P. westermani metacercariae from Namkoy stream, Chieng Village.

Namphou stream, Namkane Village.

Kasy market (Unknown origin).



P. heterotremus metacercariae from Namkoy stream, Chieng Village.

Namphou stream, Namkane Village.

Sero-prevalence survey

- ✧ **Kasy District**

- ✧ **Namkane *and* Phouhinkecfay villages**

- ✧ **patients admitted in Kasy District Hospital**

- ✧ **Phon Hong *and* Vientiane Province Hospitals**

- ✧ **patients with respiratory symptoms admitted at PhonHong and Vientiane Province Hospitals**

Sera analysis

*

Immunoblot *technique*

Paragonimus sp. infection rate using Immunoblot by village/hospital, (2006)

Village/hospital	No. of examined	<i>Paragonimus</i> sp. infection (%)
Ban Namken	149	16 (10.7)
Ban Phouhinlecfay	100	3 (3)
Kasy District hospital	66	2 (3)
PhonHong hospital	1	0
Vientiane Province hospital	8	1
Total	324	22 (6.7)

Sera analysis



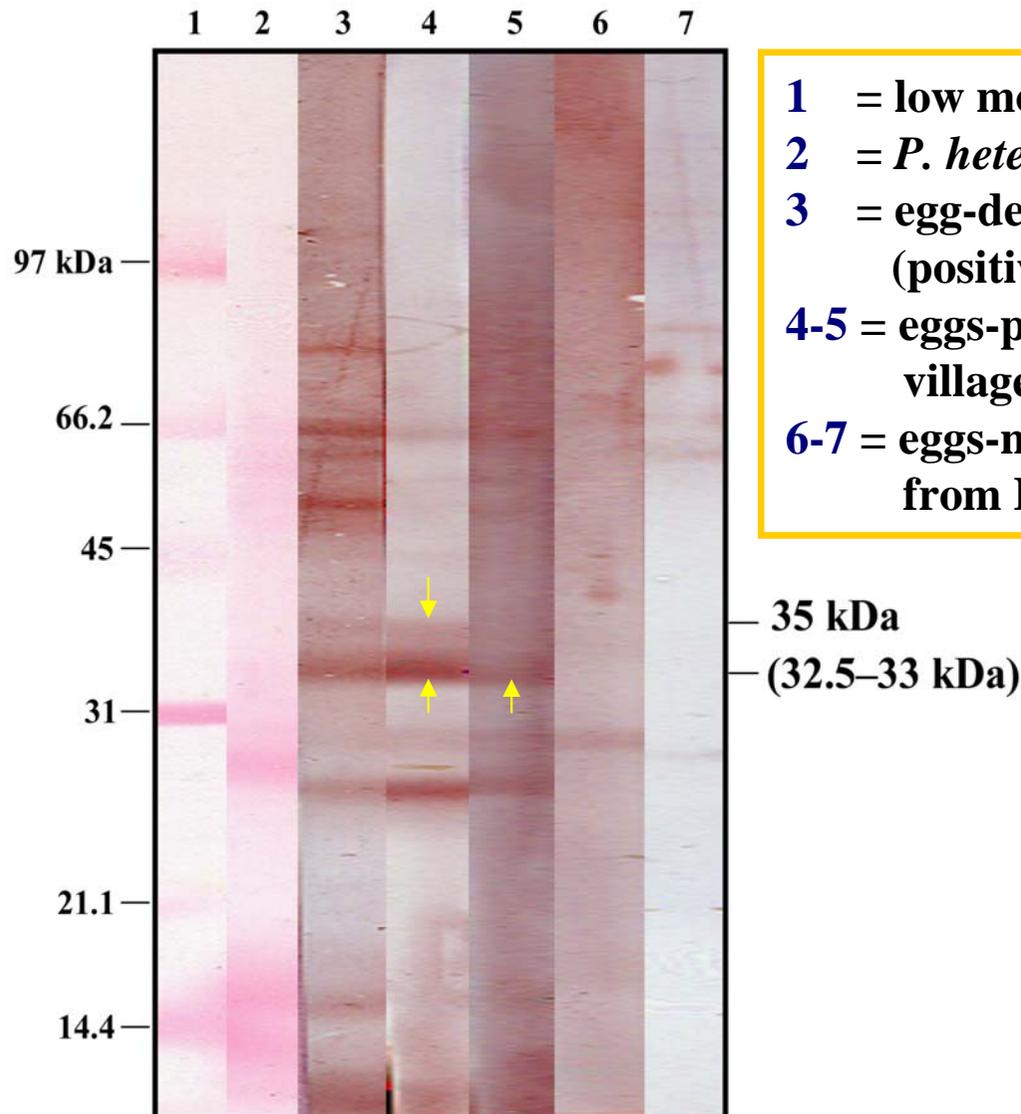
Immunoblot *technique*

Prevalence of *Paragonimus* sp. infection rate using Immunoblot technique in Kasy District, (2006)

Village/hospital	No. of examined	<i>Paragonimus</i> sp. infection (%)
Ban Namken	149	16 (10.7)
Ban Phouhinlecfay	100	3 (3)
Kasy District hospital	66	2 (3)
Total	315	21 (6.6)

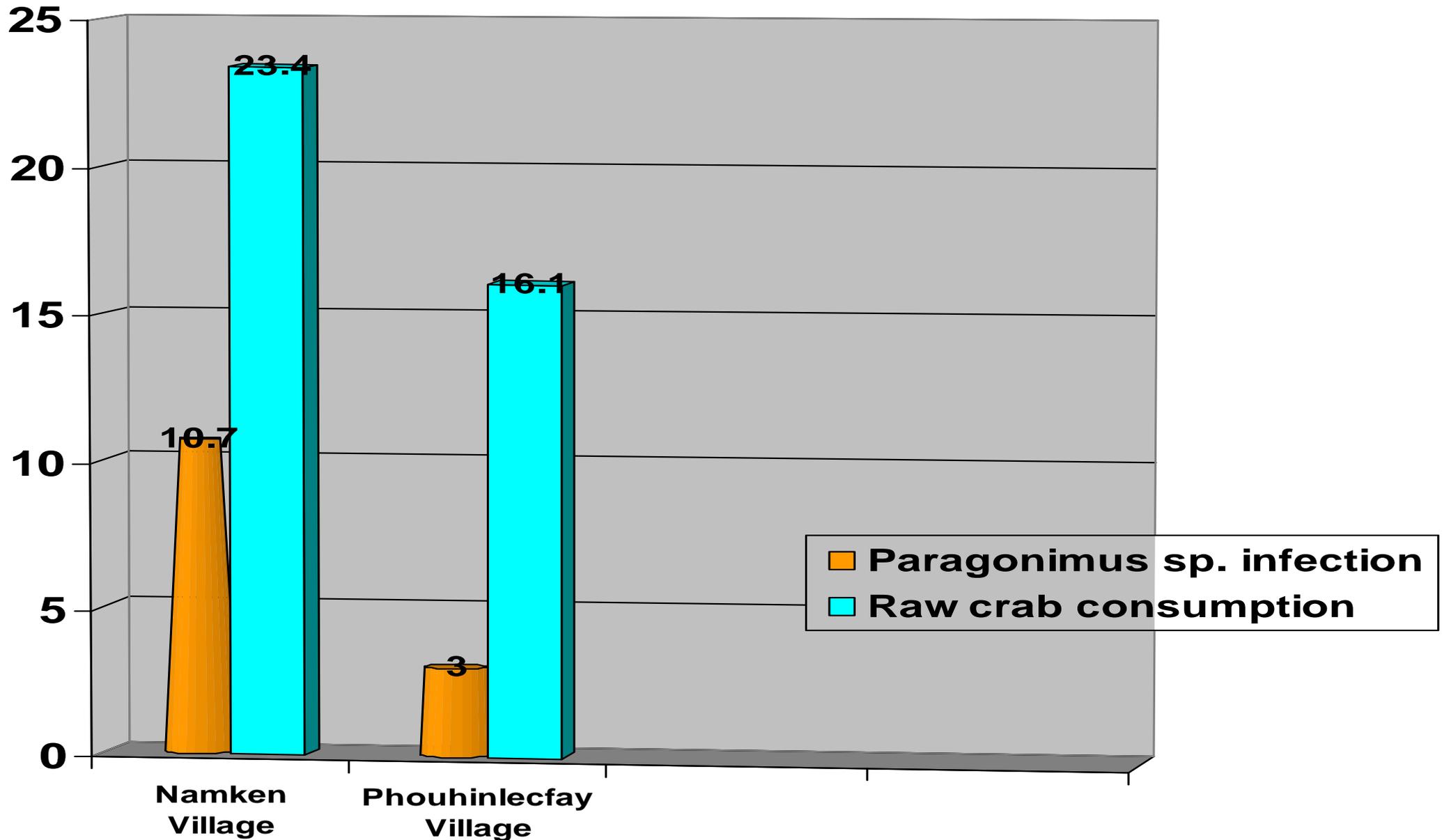
Sera analysis * Immunoblot technique

Reactive bands (32.5, 33, and 35 kDa) for *Paragonimus* antigens from paragonimiasis sera from people in Kasy District



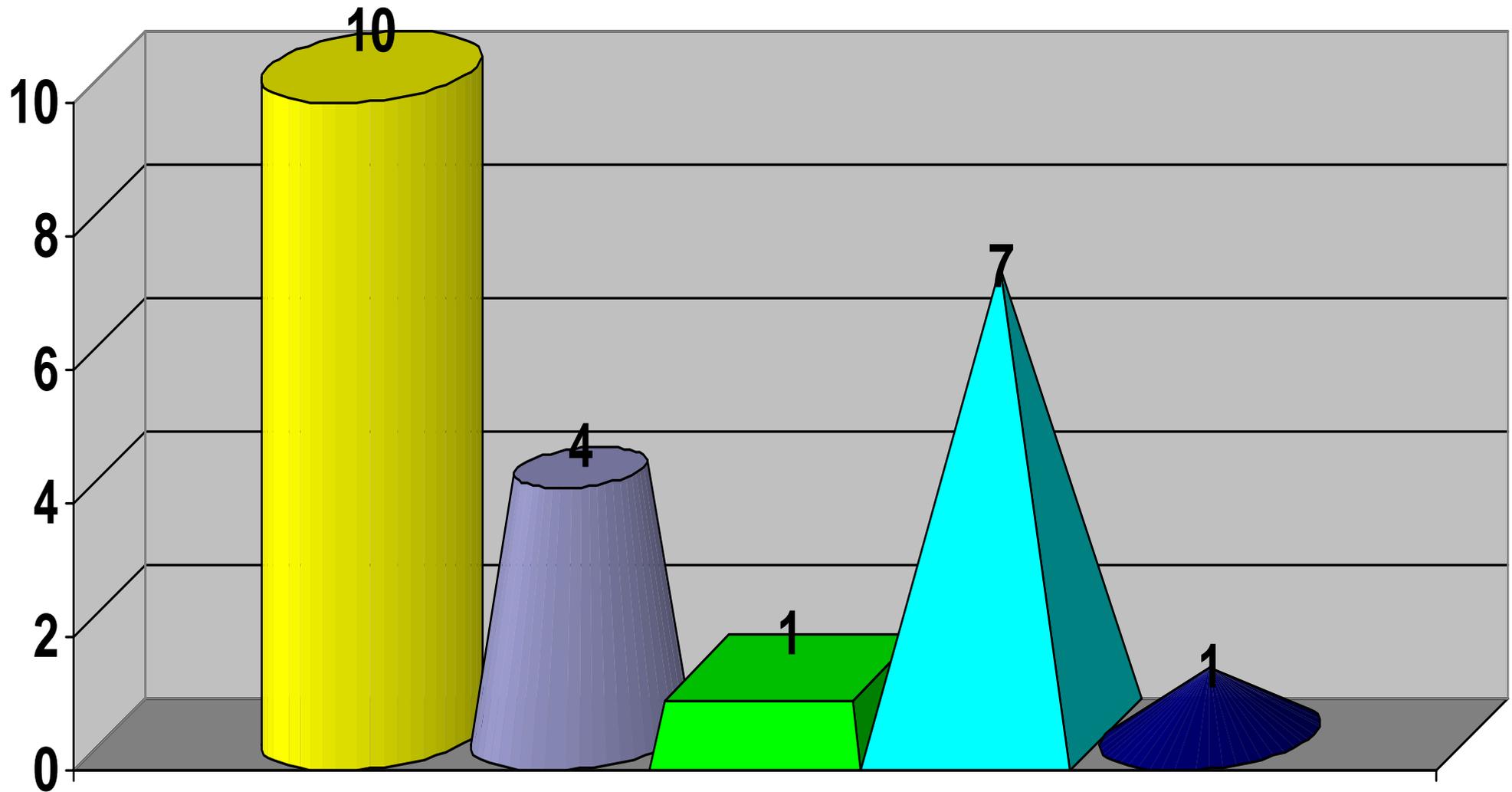
- 1** = low molecular weight markers
- 2** = *P. heterotremus* antigen stained with Ponceau S-200
- 3** = egg-detected Thai case by sputum examination (positive control)
- 4-5** = eggs-positives in sputum and negative in fecal samples, villagers from Lao P.D.R
- 6-7** = eggs-negatives in sputum and fecal samples, villagers from Lao P.D.R

Comparison of prevalence **between** *Paragonimus* sp. infection and raw crab consumption rate from Immunoblots by village, Kasy District (2006)



Clinical symptom in 22 positive cases.

■ chronic cough ■ hemoptysis ■ purulent sputum
■ chronic chest pain ■ no cough



Conclusion

- ✧ **Prevalence for paragonimiasis in Kasy District is relatively low, (6.6%)**
- ✧ **Kasy District is one of endemic area, 1 active case from a patient had sputum positive in Namken Village**
- ✧ **Crab intermediate hosts in four surveyed villages are also low infested (6.5%) with metacercariae of *Paragonimus***
- ✧ **This parasitic infection is really one of the health problems in this region.**
- ✧ **Paragonimus infection should be suspected in any patients with chronic cough, hemoptysis, and chronic chest pain.**
- ✧ **For these reasons, sputum examination for paragonimiasis should be done with tuberculosis detection in endemic areas.**

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