

## Status of intestinal parasite infections in inhabitants of Palmar, Guayas Province, Ecuador

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**Abstract:** Status of intestinal protozoan and helminthic infections was surveyed in mestizo population living in rural parish of Palmar and its nearby recintos(villages). Three of the surveyed villages were at the Pacific coast and 5 villages were in inner pasture land, located about 100 km west of Guayaquil, the second largest city in Ecuador. One stool sample was examined by one cellophane thick smear for helminth ova and one direct smear stained with Lugol's iodine solution for protozoan cysts. Of 325 persons examined, 66.1% were positive for any ova or cyst. The positive rates were: 18.1% for *Ascaris lumbricoides*, 19.4% for *Trichuris trichiura*, 0.6% for hookworm, 3.7% for *Hymenolepis nana*, 1.8% for *Taenia* sp., 19.4% for *Entamoeba histolytica*, 28.6% for *Entamoeba coli*, 5.5% for *Endolimax nana*, 1.5% for *Iodamoeba buetschlii*, 11.1% for *Giardia lamblia* and 0.6% for *Chilomastix mesnili*. Poor supply of potable water was considered the main cause of high prevalence of intestinal protozoan infections.

**Key words:** Intestinal helminths, intestinal protozoa, *Ascaris lumbricoides*, *Trichuris trichiura*, hookworm, *Hymenolepis nana*, *Taenia* sp., *Entamoeba histolytica*, *Entamoeba coli*, *Giardia lamblia*, Ecuador

### INTRODUCTION

Because of the low rate of plumbing and sewage disposal systems in Latin American countries in general, soil-transmitted helminthes and intestinal protozoan parasites have been known to be prevalent among rural people (Schenone *et al.*, 1981a, b; Aguilar, 1981; Amaral and Buseti, 1979; Cabrera *et al.*, 1981; Figueroa *et al.*, 1981 and 1985; Lopez *et al.*, 1981; Torres *et al.*, 1982; Cornejo *et al.*, 1985; Schweikart *et al.*, 1987). Medically important diseases of parasite origin, such as schistosomiasis, Chagas' disease, leishmaniasis and paragonimiasis are also endemic focally in some parts

of this world. But the public health importance of intestinal parasites should not be underestimated considering their high prevalences and pathogenicity.

In August 6~25, 1989, we had visited a rural parish of Palmar, a littoral region of Ecuador, under the auspices of the National Federation of Catholic Physician's Guild of Korea to help the "Dispensario medico parochial nuestrasenora de Fatima", which is one of the important parish activities. In order to observe the relative importance of intestinal parasite infections in health of the local people, we examined stool specimens. Here we report the results.

## MATERIALS AND METHODS

### 1. Surveyed area and people

The subjected area was a parish of Palmar and 6 nearby recintos in Guayas Province(Fig. 1). The area was located at coast and nearby flat and dry pasture land. Total population of the area was estimated about 20,000 of which that in Palmar was about 8,000. Main revenue of people comes from pigs, cattles, goat, sheep, poultry *etc.*, reared freely in the pasture land. At coastal villages, primitive fishing, larval collection of shrimp at sea bed and unloading fish from fishing vessels are additional revenues. The plumbing and sewage systems were totally absent. Potable water was shipped by lorry to individual household, which is said sometimes not disinfected. Each house has a tank keeping the water, but its cleanliness is many times questionable.

### 2. Sample and examination

Stool samples of finger-tip to fist size was collected in polyvinyl envelop from 325 indi-

viduals who visited the "Dispensario" or medical mobile team. Age of examined people ranged from 4 months to 80 years. A total of 107 males and 218 females was examined. The subjected people were not selected. Stools were collected from patients by order in queue, disregarding their symptoms.

Each fecal specimen was examined by one cellophane thick smear for helminthes ova and one direct smear stained with Lugol's iodine solution for protozoan cysts.

## RESULTS

The results of stool examination were presented in Tables 1 and 2. The number of people examined in each village was; 160 in Palmar, 31 in Ayangue, 35 in Jambeli(coastal villages), 11 in Bambil Desecho, 33 in Rio Seco, 5 in Bambil Collao, 30 in Manantial de Colonche and 20 in Sevilla(villages in inland pasture).

Of 325 people examined, 66.1% were positive either for helminthes or protozoa. Rate of protozoan cyst passers(46.1%) was higher than

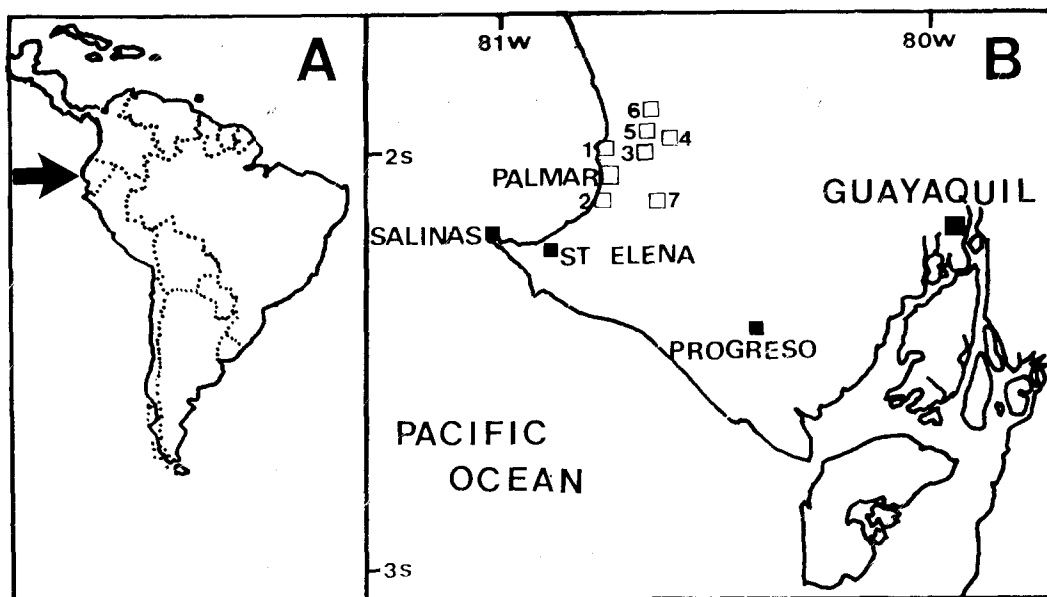


Fig. 1. A: Approximate location of the surveyed areas(arrow) in South America. B: Surveyed villages in Guayas Province, Ecuador were the parish of Palmar, and its recintos of Ayangue (1), Jambeli (2), Bambil Desecho (3), Rio Seco (4), Bambil Collao (5), Manantial de Colonche (6) and Sevilla (7).

**Table 1.** Results of stool examination

	No. (%) in people living in		Total
	coastal villages	pasture land	
No. examined	226	99	325
No. positive	143(63.3)	72(72.7)	215(66.1)
Helminth ova positive	98(43.3)	26(26.3)	124(38.2)
<i>A. lumbricoides</i> *	50(22.1)	9( 9.1)	59(18.1)
<i>T. trichiura</i>	53(23.5)	10(10.1)	63(19.4)
Hookworm	0	2( 2.0)	2( 0.6)
<i>H. nana</i>	10( 4.4)	2( 2.0)	12( 3.7)
<i>Taenia</i> sp.	0	6( 6.0)	6( 1.8)
Protozoa cyst positive	84(37.2)	66(66.7)	150(46.1)
<i>E. histolytica</i>	33(14.6)	30(30.3)	63(19.4)
<i>E. coli</i>	43(19.0)	50(50.5)	93(28.6)
<i>E. nana</i>	9( 4.0)	9( 9.1)	18( 5.5)
<i>I. buetschlii</i>	3( 1.3)	2( 2.0)	5( 1.5)
<i>G. lamblia</i>	23(10.2)	13(13.1)	36(11.1)
<i>C. mesnili</i>	2( 0.9)	0	2( 0.6)

\* Unfertilized egg passers were 25(11.1%) in coastal villages and 9(9.1%) in people in pasture land.

the positive rate of helminth ova(38.2%). Coastal villages showed higher positive rate of helminth ova than villages in inland pasture.

On the contrary, the protozoan cyst passer

rate was much higher in inland pasture than in coastal villages.

Of individual parasites, the egg positive rates of *A. lumbricoides* and *T. trichiura* were 18.1% and 19.4% respectively. Eggs of *Taenia* sp. were found in villages of inland pasture (6.0%). *H. nana* was prevalent infection(3.7%). Of protozoan infections, pathogenic *E. histolytica* and *G. lamblia* showed the cyst passer rates of 19.4% and 11.1% respectively. When the positive rates were analyzed by age of people, *H. nana* and *G. lamblia* showed evident high rates in young ages.

### DISCUSSION

Because we can not trace the previous reports of intestinal parasites in Ecuador, we compared our results with reports in other Latin American countries. Using modified Telemann technique of stool examination, Schenone *et al.* (1981a) reported the status of intestinal infections of parasites in 5 biogeographical zones of Chile: 4.8~23.2% in *E. histolytica*, 29.5~47.4% in *E. coli*, 20.2~50.0% in *E. nana*, 2.4~11.0% in *C. mesnili*, 2.2~3.2% in *I. buetschlii*, 14.0

**Table 2.** Results of stool examination analysed by age

	Positive rate (%) in age (year) of					Total
	0~9	10~19	20~29	30~39	40~	
No. examined	90	43	36	31	72	325*
No. positive (%)	57.8	74.4	72.2	61.3	65.3	66.1
Helminth ova positive	27.8	48.8	50.0	35.5	27.8	38.2
<i>A. lumbricoides</i>	17.8	20.9	22.2	19.4	13.9	18.1
<i>T. trichiura</i>	8.9	27.9	33.3	16.1	13.9	19.4
Hookworm	1.1	0	0	0	1.4	0.6
<i>H. nana</i>	3.3	11.1	2.8	0	0	3.7
<i>Taenia</i> sp.	2.2	0	2.8	0	4.2	1.8
Protozoa cyst positive	42.2	48.8	50.0	35.5	55.6	46.1
<i>E. histolytica</i>	10.0	27.9	16.7	19.4	29.2	19.4
<i>E. coli</i>	22.2	27.9	27.8	32.3	43.1	28.6
<i>E. nana</i>	3.3	7.0	8.3	6.4	6.9	5.5
<i>I. buetschlii</i>	1.1	2.3	2.8	0	2.8	1.5
<i>G. lamblia</i>	22.2	11.6	8.3	0	5.6	11.1
<i>C. mesnili</i>	0	0	2.8	0	0	0.6

\* Fiftythree people without the record of age were excluded.

~20.5% in *G. lamblia*, 0.3~20.7% in *A. lumbricoides*, 0.3~28.5% in *T. trichiura*, 1.3~7.7% in *H. nana* and 0.0~0.6% in *Taenia* sp. The prevalence of *A. lumbricoides* and *T. trichiura* had shown gradual decreasing tendency in Chile during 10 years from 1970 to 1980 (Schenone *et al.*, 1981b). After the report, however, the even higher prevalence of the intestinal parasites have been reported in Chile (Lopez *et al.*, 1981; Figueroa *et al.*, 1985; Torres *et al.*, 1982; Schweikart *et al.*, 1987).

Our results of stool examination were not different from the prevalence reports in Chile or Brazil (Amaral and Buseti, 1979). Socio-economic status in South America in general seems not so different each other especially in rural villages in terms of plumbing and sewage disposal facilities. Therefore, water borne intestinal protozoa of *G. lamblia* and *E. histolytica* were highly prevalent. In this observation, we examined stool by one direct smear in finding the protozoan cysts. This technique is inferior to concentration techniques especially in detecting chronic cyst passers from whom the number of passed cysts are minimal. However, our results were not by far different from the results in previous reports (Schenone *et al.*, 1981). Any way, safe supply of potable water was one of the most important problems for the sake of people's health.

One additional thing to mention is taeniasis/cysticercosis in the surveyed area. Lack of toilets and freely roaming hogs in the villages seem ideal for maintaining life cycle of *Taenia solium*. Actually we could find 3 heavily infected hogs at a municipal slaughter house of nearby Salinas City during 2 weeks period. The infected hogs came from villages in pasture land where the egg positive rate of *Taenia* species was 6.0%. We thought it necessary to study the species of *Taenia* infected in the people and to control taeniasis in the area. By repeated stool examination and chemotherapy of the infected people together with more stringent meat inspection, this endemic disease can be controlled. *T. solium* caused cerebral cysticercosis. But people think

that cysticercosis of hogs are more important because it reduced their income and affected their daily life directly.

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==국문초록==

**에파둘국 파야스주 빨말 본당 지역 주민의 장내 기생충 감염상태**

중앙대학교 의과대학 기생충학교실, 가톨릭의대 강남성모병원 내과학교실\*

조승열 · 김중호\* · 박성학\*

한국 가톨릭의사회회는 남미 에파둘국 파야스주의 해안 지방인 빨말 본당에서 운영하는 “빠띠마 성녀 기념 본당 진료소”의 의료사업을 지원하고 있다. 그 사업의 하나로 이 지역 메스띠조인의 보건 실태를 관찰하고 앞으로의 중점 보건 사업을 파악하기 위하여 1989년 8월 6일부터 8월 19일까지 주민 진료와 함께大便검사를 실시하고 기생충 감염 실태를 조사하였다.

이 지역은 동부 태평양에 연한 해안 어촌 마을인 빨말(본당), 아양게, 합벨리(공소)와 해안에서 떨어져 있고 목축을 주업으로 하는 바빌 테세초, 리오세꼬, 밤빌꼬자오, 마난띠알 데 꼴론체 및 세비자 등 공소마을로 구성되어 있고 주민은 모두 약 20,000명으로 추산된다.

大便검사는 직접 도말법(요드염색 후) 1매와 셀로판후층도말법 1매를 각각 검경하여 장내 원충 포낭 및 윤충 총란 배출을 검사하였다. 검사 대상자는 진료소를 찾은 주민이며 빨말 본당 지역의 주민 160명을 포함한 해안 마을 주민 226명과 내륙 공소 마을 주민 99명 등 모두 325명이었다.

大便검사 결과 총란 및 포낭 양성률이 66.1%이었고 윤충 총란 양성률은 38.2%, 원충 포낭 양성률은 56.1%이었다. 기생충별 양성률은 회충 18.1%, 편충 19.4%, 구충 0.6%, 왜소조충 3.7%, 유구 및 무구조충 1.8%, 이질아메바 19.4%, 대장아메바 28.6%, 소형아메바 5.5%, 요드아메바 1.5%, 람블편모충 11.1%, 킬로마스틱스메니리 0.6%이었다.

이상의 결과를 종합하여 보면 이 지역에서 가장 중요한 기생충 감염은 이질 아메바와 람블편모충이며 따라서 위생적인 식수를 마련하는 것이 가장 중요한 보건사업이라고 판단되었다. 목축을 주로 하는 내륙 마을중에는 조충증과 유구낭미충증이 유행하는 지역이 있었다. [기생충학잡지, 28(2):109-113, 1990년 6월]