Intestinal Schistosomiasis due tu *Schistosoma mansoni* in Martinique island

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Schistosomiasis Regional Meeting – PAHO/WHO
San-Juan, Puerto-Rico October 21, 22

Atlantic Ocean

« Windward coast »

« Côte au vent »

Caribbean sea

« Leeward coast »

« Côte sous le vent »

1 128 km^2

14°30 N latitude

Wet tropical climate

Hygrométry : 78 - 80%

°C : 25 - 28

°F : 77 – 82,4

History

- First reports: 1906 (Lahille), 1908 (Leger), and 1910 (Noc)
- 1951 (Deschiens) : prevalence rate estimation = 6,4%
- 1961 : prevalence of *Schistosoma mansoni* infection = 8,4% (routine parasitological examinations in Institut Pasteur - Martinique)
- 1970 : combined parasitological and serological survey among schoolchildren (10/34 communes of Martinique) :
  - Stool analysis : prevalence of 0,3% to 18%
  - Immunodiagnostic tests : prevalence of 37% to73%
- 1971 : large-scale serological survey (5000 persons, mostly female, 5-20 years old, in 20 communes : wide variation in prevalence between communes, (range: 5,3% - 73,5%)

➔ Schistosomiasis due to *Schistosoma mansoni* = real public health problem in Martinique island

➔ 10.July.1973: decree n° 73-705 to organize and to finance epidemiological inquiries

➔ 1978 : Creation of the department of fight against intestinal parasitosis (DDAS* – Martinique).

History

Enquête INSERM* 1977 - 1978

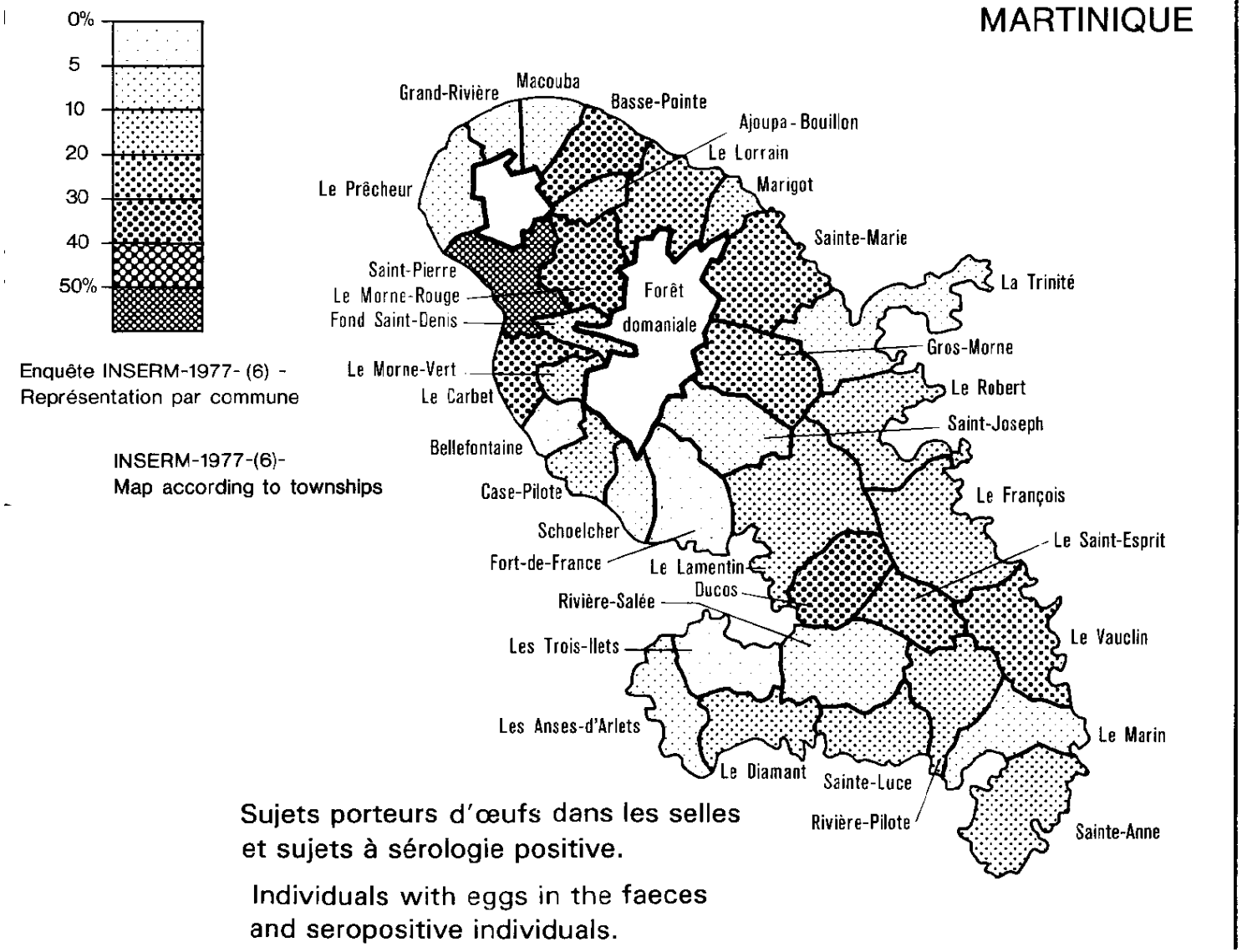
- Systematic survey of intestinal schistosomiasis
  800 families ➔ 3880 persons

  - **Prevalence rate :**
    - 30% Basse-Pointe, St-Pierre, Morne-Rouge, Carbet (localities on [the] slopes of Mount Pelée) and Ducos (south of the island)
    - 20 to 30% in 3 communes in the north-east (le Lorrain, Ste-marie, Gros-Morne) and 2 in the south-eath (St-Esprit, Vauclin)
    - 10-20% Case-Pilote, Morne-Vert, Fonds-St-Denis, Ajoupa-Bouillon, Marigot in the north, Le Robert and Le Lamentin in the center, Le Diamant, Ste-Luce, Rivière-Pilote, Le Marin and Ste-Anne on the southern coast
    - <10% in 12 geographically scattered communes

  ➔ Mean prevalence (combined data of serological and parasitological results) : 12%

*Institut National de la Santé et de la Recherche Médicale

Taux de prévalence



Shistosomiasis control program

Following this survey, a control program has been developed associating :

- Health promotion/ education
- Detection and treatment of patients
- Biological control program against the intermediate snail host, *B. glabrata* using the competitor snail, *Melanoïdes tuberculata* developped in the transmission sites
- Development of individual and collective sanitation

Shistosomiasis control program

Intermediate hosts control (1)

- Abundance of surface water and highly stable temperatures ➔ ideal conditions for freshwater snails development
- 2 belong to the genus *Biomphalaria,* playing role in transmission of *Schitosoma mansoni :*
  - *B. glabrata* is known to be present in Martinique since 1874 ; his distribution gradually reduced since 1967 when *B. straminea* was monitored for the first time and spread because of his better adaptation to irregular watercourses discharges
  - Survey 1972-1978: *B. glabrata* was found in one site out of the 22 previously reported. At the same time, *B. straminea* was found in over 70 sites

Biomphalaria glabrata

Biomphalaria straminae

Shistosomiasis control program

Intermediate hosts control (2)

- 1979: a mollusk thiaridae, *Melanoides tuberculata* in « rivière Madame » (Fort-de-France), in ponds « Habitation Leyriz (Basse-Pointe) »
  - Mollusk native of the Middle East and East Africa,
  - Spread in all intertropical zone today
  - Excellent competitor of planorbs
- 1983: introduction into watercress beds of Saint-Pierre botanical garden, an active site of transmission
- 1985: quasi-total disappearance of both species of planorbes presents in this site and high density of the competitor mollusk
- Introduction in other groups of watercress beds listed in the early 1980s
  - 1986: natural colonization of other sites by *M. tuberculata* = > encroachment to hydrographic system of Martinique
  - 1996: *B. glabrata* persistence only in 2 sites: watercress bed of “Pointe la mare » (Saint-Pierre) and pond of Maupeou (Riviére-Salèe)

    B. straminea was present in a sporadic way on the whole island

Shistosomiasis control program

Health promotion/ education

Simultaneously with biologic fight against *B. glabrata*, a program of sanitary and medical intervention started in1978. The objective was to reduce the transmission of all intestinal parasitosis including schistosomiasis :

- **Knowledge improvement :**
  - Parasite cycle
  - Importance of the intermediate host mollusk
  - Role of humans in transmission

- **Disadvised practices** (river baths, crab fishing, laundering,)
- **Importance of collection and treatment of wastewater**

Shistosomiasis control program

Progress of individual and collective sanitation

General hygiene improvement of the environment :

- Fight against unhealthy housing
- Extension of conveyance systems of drinkable water
- Development of sanitation

Shistosomiasis control program

Parasitological screening and efficiency evaluation of fight programs

- Stool analysis
- Serological monitoring

➔ Since 1984 : no cases of infection in children less than 10 years old

➔1988 : prevalence = 0,60%

➔1994-1995 : prevalence = 0,27%

Shistosomiasis control program

Treatment of patients

Prescription of an antiparasitic treatment to all identified parasites carriers

1978 : niridazole

1981 : oxamniquine

1995 : praziquantel

- Until 1987, department of fight against intestinal parasitosis :
  - Screening
  - Prescription and delivery of an antiparasitic treatment

- After 1987 ➔ Liberal medicine

Schistosomiasis in Martinique today

- Some cases of old infections (not viable cysts in stools or rectal biopsy)
- 2 active infections :
  - 1 case: bathing in Acomat falls in Pointe-Noire - Guadeloupe (2000)
  - 1 case: patient from Ste-Lucia (1999)

- Diagnosis mostly performed in non-hospital labs
- No serological survey
- No detection of potentially nail infection

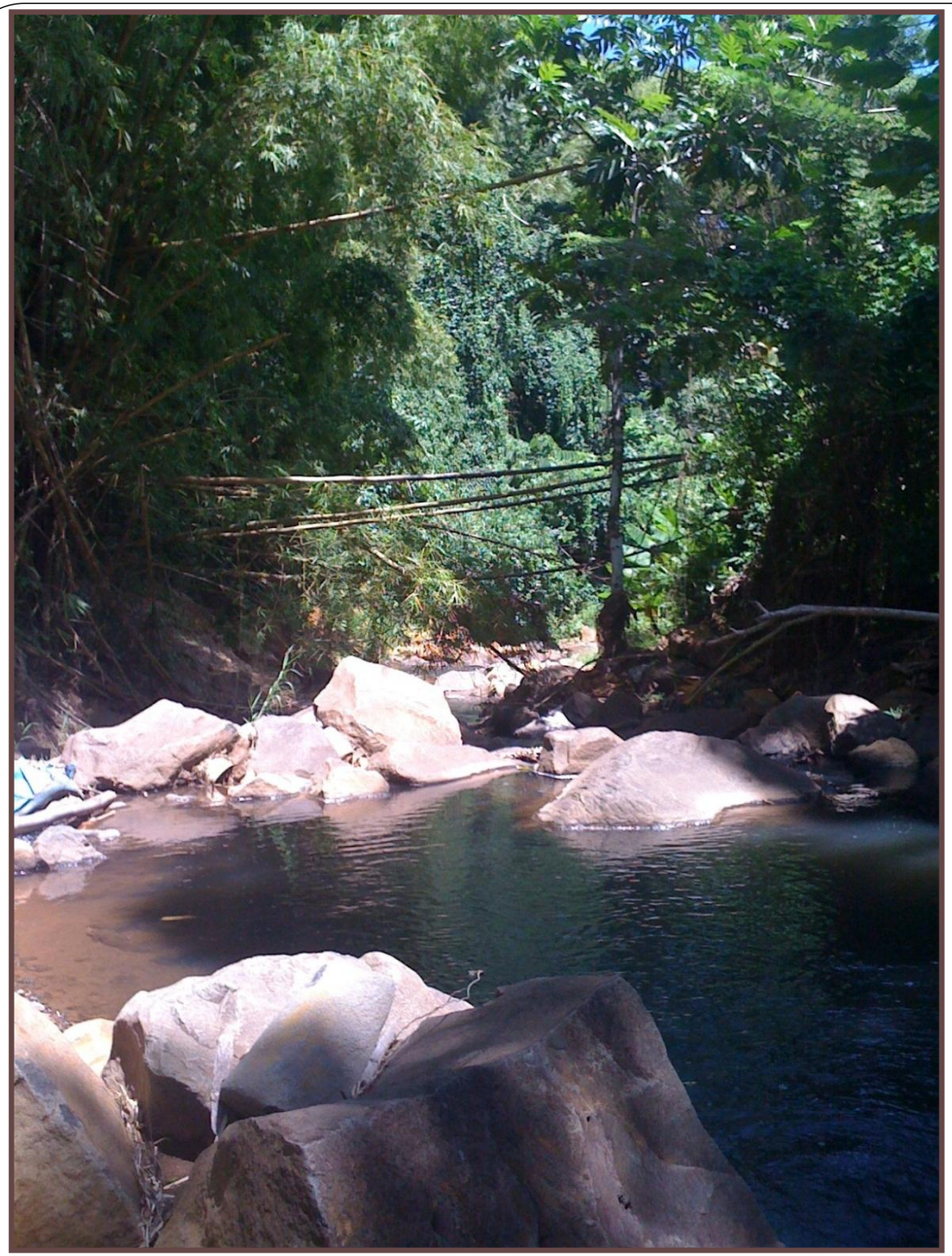
Conclusion

- Snails population and parasites decline
- Strong reduction of human prevalence since 1977
- Today, only few cases corresponding to old infections

➔ **Total interruption of the transmission ?**

- No surveillance since 2000 (Pointier) :
  - Of intermediate hosts
  - Of human prevalence

In a context of population craze for river bathing…



Thank you for your attention