

RESEARCH NOTE

High Prevalence of Malaria in a Village of the Colombian Pacific Coast

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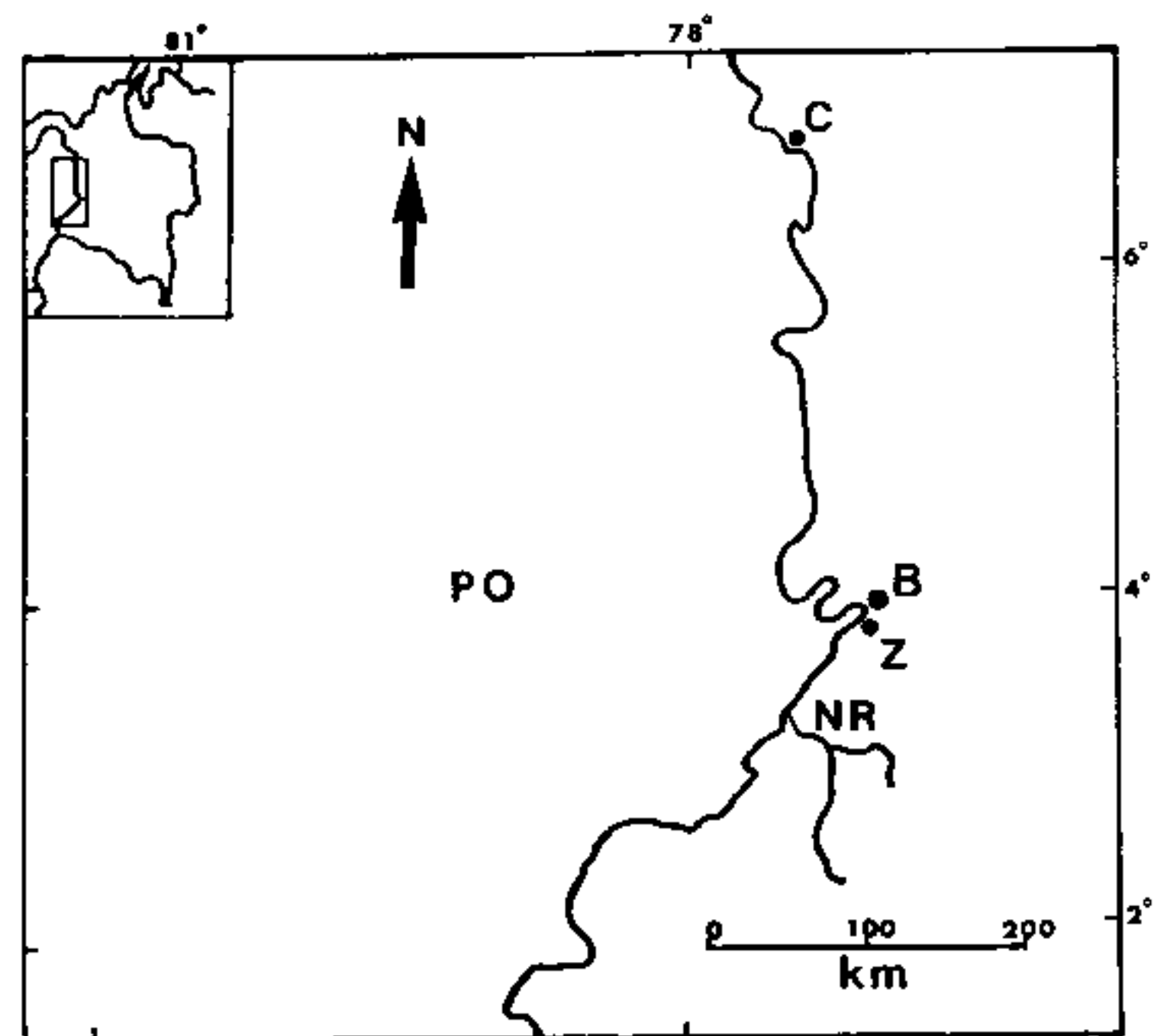
Very little is known about the present malaria prevalence in the Colombian Pacific coast. In an epidemiological survey made in Cupica (northern part of the Pacific coast), during April 1989, the prevalence of malaria infection was found to be 11.32% of which 87.5% was *Plasmodium falciparum*, and 12.5% *P. vivax* (W Rojas et al. 1992 *Parasitol Today* 8: 141-144). In a study made during one of the peaks of transmission (May-June 1986), in six villages of the Naya river basin, situated in the southern Pacific coast, the survey of parasitemias by thick blood smears revealed a low mean prevalence of $0.95 \pm 1.02\%$. Among the positive cases, 89.6% were *P. falciparum* infections, 9.2% were *P. vivax* and 1.2% were *P. malariae* or mixed infections (E Sevilla-Casas 1993 *Soc Sc Med* 17: 1155-1167).

The present study was undertaken during the first two weeks of June 1994, in the village of Zabaletas, located at about 25 km from Buenaventura, the main port of the Pacific coast and not far away from Cupica and from the Naya basin, as shown on the map. Zabaletas is a rural settlement of black autochthonous people with 560 inhabitants belonging to 172 families. The place

is surrounded by tropical forest and crossed by a large river. The mean annual temperature is about 28°C and the mean annual rainfall is 7500 mm. Human activities are forest exploitation, fish farming and cultivation of tropical fruits such as banana, chontaduro (*Pyrenoglyphis major*), borojó (*Boroja patinoi*) and yucca roots (*Manihot* spp.).

The study was performed by collecting blood and preparing thick smears which were then stained with Giemsa. Subjects were selected at random, independently on the presence of malaria symptoms, and a total of 318 persons were examined. Smears were considered negative after the examination of one hundred fields.

The blood of 65 persons (20.4%) presented malaria parasites. The distribution among sexes was equal, with 50.8% and 49.2% for women and men, respectively. The analysis of the distribution by age groups, as shown in the Table, indicates that it was homogenous. The malaria prevalence showed a trend to decrease in the groups above 15 years old, but this result was not statistically significant ($p > 0.05$, χ^2 test). The absence of variation in the prevalence of malaria in the different age groups indicates a low level of immunity. The prevalence in the age group 2-9 years was 26.7%, indicating a mesoendemic situation for malaria in this area, according to the Yaoundé classification (WHO 1964, Non Serial Publication, WHO Edition, Genève). 72.3% of positive cases were found to be *P. falciparum* infections, and 27.7% to be *P. vivax* infections. The prevalence of symptomatic



Map of the Colombian Pacific coast showing the area of the present survey (Zabaletas) and of previous studies mentioned in the text (Cupica and Naya River basin). B: Buenaventura; C: Cupica; NR: Naya River; PO: Pacific Ocean; Z: Zabaletas

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TABLE

Prevalence of malaria in Zabaletas by age, during June 1994

	Age in years					Total
	0-4	5-9	10-14	15-44	>44	
Persons examined	49	74	68	109	18	318
Positive for malaria (%)	12 (24.5)	18 (24.3)	15 (22.1)	17 (15.6)	3 (16.7)	65 (20.4)
Relative % of Pf infections	75	66.7	72.2	70.6	33.3	72.3
Symptomatic Pf infections	1	2	0	1	0	4
Symptomatic Pv infections	3	1	0	2	2	8

Pf: *P. falciparum*; Pv: *P. vivax*

infections was only 8.5% (4 cases) for *P. falciparum*, but 44.4% (8 cases) for *P. vivax*. The very low number of symptomatic cases did not allow a precise analysis of correlation with age. No case of severe malaria was recorded during the survey. Parasitemias in both *P. falciparum* and *P. vivax* infections were lower than one parasite per field, except for the following four *P. vivax* cases: one 7 year old patient presented one parasite per field and three patients presented from two to 20 parasites per field, two of them were 7 years old and one was 40 years old. Therefore, no correlation between the levels of parasitemia and the age could be evidenced.

According to a study on the malaria occurrence in the district of Buenaventura (including Zabaletas) during 1987 to 1993, two annual peaks of transmission could be evidenced, in April-May and September-October (F Mendez, JG Carrasquilla, submitted to *Colombia Med*). The relatively high prevalence of malaria in this area (although it was observed at the end of a period of high transmission) as compared to previous studies performed during a similar period of the year, in neighbouring localities of the Colombian Pacific coast (Rojas et al. *loc. cit.*, Sevilla-Casas *loc. cit.*) could be due to the specific environmental situation of Zabaletas. Numerous large water tanks are located very close to the village and used for fish breeding. Houses are made of wood and very open in order to provide ventilation due to the high temperature. Use of bednets is not frequent because of economical and cultural reasons. *Anopheles nuneztovari* is the predominant mosquito species in the village (DPT, unpublished data). The adult

mosquito develops its larvae phase in water tanks, and have intra-domiciliary biting habits, as shown by P Fajardo and A Alzate (1987 *Colombia Med* 18: 14-18). Hence, it is not surprising that transmission of malaria could be frequent in this place, leading to the high prevalence observed in our study. An additional human risk factor could be trees felling, as *A. neivai* is also present (DPT, unpublished data), and the abundance of bromeliads in the forest surrounding the village provides an excellent environment for its breeding. Both *A. nuneztovari* and *A. neivai* have been demonstrated to be vectors of malaria in the Pacific coast of Colombia (Fajardo, Alzate *loc. cit.*, H Carvajal et al. 1989 *Trans R Soc Trop Med Hyg* 83: 609). The large predominance of *P. falciparum* infection appears to be a characteristic of the malaria in the Colombian Pacific coast, as shown in other studies (Rojas et al. *loc. cit.*, Sevilla-Casas *loc. cit.*). Black people are mostly Duffy negative and it could be the reason for the refractoriness to *P. vivax* in most of them.

Further studies on the malaria transmission in Zabaletas are required in order to set up a more effective prevention strategy. Curiously, 44% of the *P. vivax* cases were symptomatic, whereas only 8% of *P. falciparum* were symptomatic and the four cases of high parasitemia were of *P. vivax*. Such finding deserve further studies such as the blood typing of the populations specially for the highly susceptible cases of *P. vivax* infected individuals.

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