



Antiprotozoal activity of medicinal plants used by Iquitos-Nauta road communities in Loreto (Peru)



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ABSTRACT

Ethnopharmacological relevance: In the Peruvian Amazon, the use of medicinal plants is a common practice. However, there is few documented information about the practical aspects of their use and few scientific validation. The starting point for this work was a set of interviews of people living in rural communities from the Peruvian Amazon about their uses of plants. Protozoan diseases are a public health issue in the Amazonian communities, who partly cope with it by using traditional remedies. Validation of these traditional practices contributes to public health care efficiency and may help identify new antiprotozoal compounds.

Aims of study: to inventory and validate the use of medicinal plants by rural people of Loreto region.

Materials and methods: Rural mestizos were interviewed about traditional medication of parasite infections with medicinal plants. Ethnopharmacological surveys were undertaken in two villages along Iquitos-Nauta road (Loreto region, Peru), namely 13 de Febrero and El Dorado communities. Forty-six plants were collected according to their traditional use for the treatment of parasitic diseases, 50 ethanolic extracts (different parts for some of the plants) were tested *in vitro* on *Plasmodium falciparum* (3D7 sensitive strain and W2 chloroquine resistant strain), *Leishmania donovani* LV9 strain and *Trypanosoma brucei gambiense*. Cytotoxic assessment (HUVEC cells) of the active extracts was performed. Two of the most active plants were submitted to preliminary bioguided fractionation to ascertain and explore their activities.

Results: From the initial plants list, 10 were found to be active on *P. falciparum*, 15 on *L. donovani* and 2 on the three parasites. The ethanolic extract from *Costus curvibracteatus* (Costaceae) leaves and *Grias neuberthii* (Lecythidaceae) bark showed strong *in vitro* activity on *P. falciparum* (sensitive and resistant strain) and *L. donovani* and moderate activity on *T. brucei gambiense*.

Conclusions: The Amazonian forest communities in Peru represents a source of knowledge on the use of medicinal plants. In this work, several extracts with antiprotozoal activity were identified. This work contributes to validate some traditional uses and opens subsequent investigations on active compounds isolation and identification.

1. Introduction

Infections caused by parasitic protozoa take an enormous toll on human health. Their prevalence is higher in tropical and equatorial countries, where the major number of deaths is due to malaria (World Health Organization, 2016a). Although significant progresses have been made in the past decades, malaria is still considered by the World Health Organization as the first parasitic disease with 229 000 deaths in

2016 in 91 countries. Chagas disease, African trypanosomiasis and leishmaniasis are classified as some of the 17 most important neglected diseases by the WHO (Simarro et al., 2012; World Health Organization, 2015a). In the absence of effective vaccines, global antiparasitic strategy relies on a multi-faceted approach based on prevention (*i.e.* vector control and pharmacological prophylaxis), quick and reliable diagnostic procedures, treatment with effective antiprotozoal drugs and medicinal plants. Natural products remain an interesting source of

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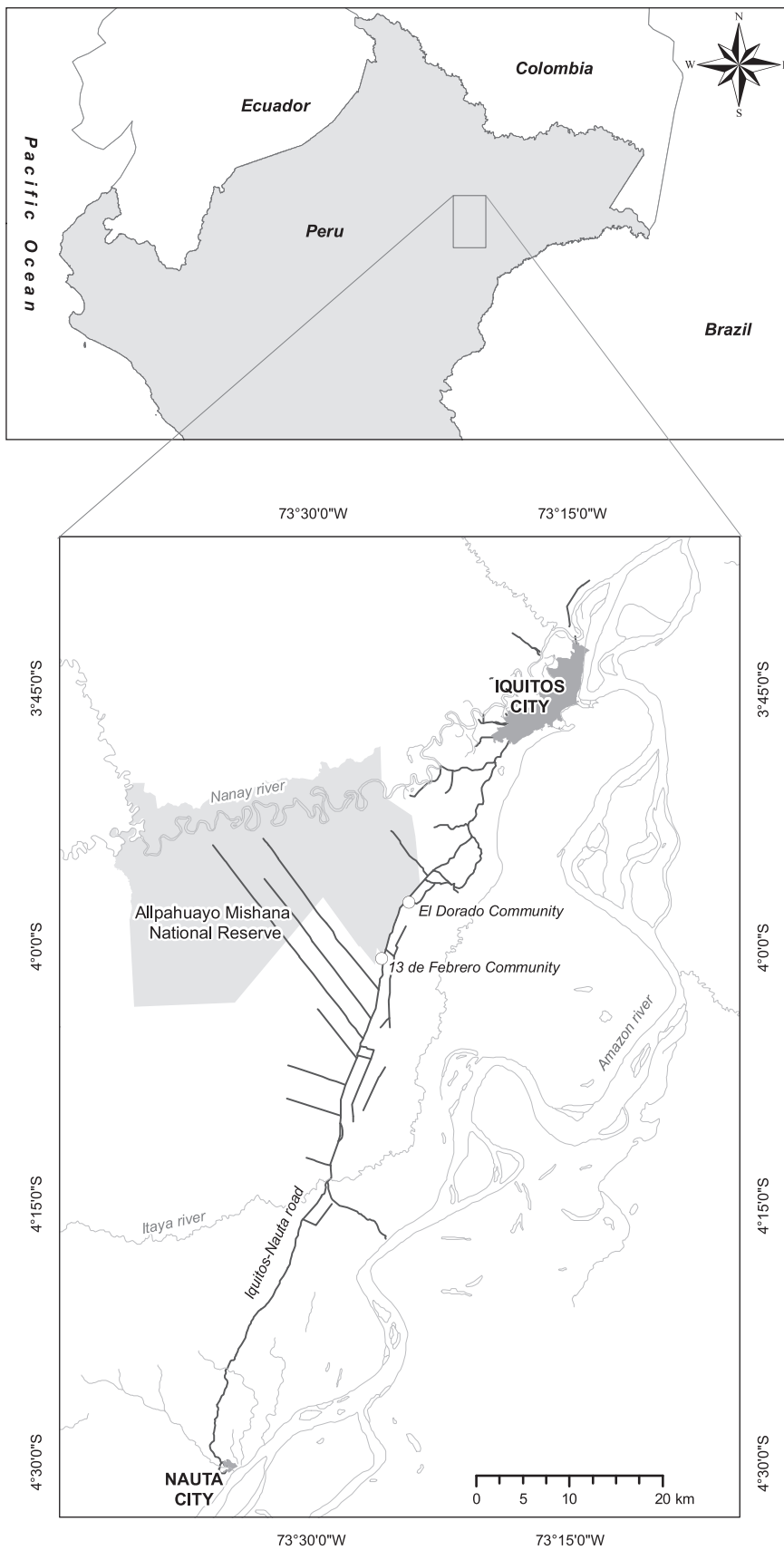


Fig. 1. Map of the place of ethnopharmacological survey.

research for the discovery of new drugs to fight NTDs (neglected tropical diseases) (Zucca et al., 2013).

Malaria is caused by the apicomplexan parasites *Plasmodium*

falciparum, *P. vivax*, *P. malariae*, *P. ovale* and *P. knowlesi* (Centers for Disease Control and Prevention, 2017). It is transmitted by female anopheles mosquitoes, which bite mainly between dusk and dawn. The

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