



An ethnopharmacological survey of the traditional medicine utilized in the community of Porvenir, Bajo Paraguá Indian Reservation, Bolivia

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ABSTRACT

Ethnopharmacological relevance: Porvenir is a semi-isolated Indian community in the Bajo Paraguá Indian Reservation in Bolivian Amazon, one of the two communities of people from the Guarasug'we indigenous nation now close to extinction. The aim of our study was the collection of data on the traditional medicine utilized in the community, and to identify new subjects for further investigation by comparison of the folk-medicinal use with the available scientific literature data.

Materials and methods: Field work was conducted for 5 months, which included participant observation, semi-structured interviews with 16 individuals, and the collection of voucher specimens for botanical identification. The knowledge of the inhabitants relating to medicinal plants was analysed by means of the modified method of Gentry and Phillips (1993a,b), which assesses the frequency and the variety of use of plants. Scientific data were gathered on selected species, and the correlations of the traditional uses of the herbs with scientific evidence were assessed.

Results: The lifestyle and beliefs in Porvenir, botanical data on the plants used, the frequency and variety of medicinal use, diseases that occur and their possible treatment, and methods of plant application are discussed in detail. 145 plant species were registered with 451 recorded uses. The majority of the plants were utilized to treat gastrointestinal complaints (60 species), followed by diseases of the central nervous system, pain and fever (37 species), diseases of the genitourinary tract (35 species), dermatological disorders (34 species) and diseases of the respiratory system (32 species). One fifth of the species are also applied in traditional medicine in other areas of Bolivia or in other countries. The majority of the 145 species used in the community have not been extensively investigated from phytochemical and pharmacological aspects. There are no data in the scientific literature on one fifth of the species.

Conclusions: The medicine applied in Porvenir and the contemporary knowledge of the people interviewed concerning plants reflect the local traditions and their changes very well, clearly demonstrating the influence exerted by conventional medicine, and how the ancestral knowledge is progressively being forgotten. The present ethnopharmacological survey indicates that 24 species that are frequently and consistently used in the community of Porvenir are perspective for further research, as their chemistry and pharmacology have not been published to date.

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1. Introduction

Porvenir is an Amazonian indigenous community in the Territorio Comunitario de Origen Bajo Paraguá (TCO, Communal Territory of Origin) in Velasco Province, County of Santa Cruz, Bolivia (Fig. 1). Bajo Paraguá, which is situated in the humid megathermal climate zone, receives an annual rainfall of 1400–1600 mm, with humidity levels of 75–82% in the humid season, and 55–70% in the dry season (FAN, 2005). The annual average temperature is 25–26 °C (Killeen and Schulenberg, 1998), the highest temperature is 38 °C

in the humid season, and the lowest one is 13 °C in the dry season. Porvenir lies in 193 m above sea level.

The 378 163 ha of the TCO has a population of about 1224 people, living in four widely separated settlements (Piso Firme, Cachuela, Porvenir and Florida); 519 of them live in Porvenir, mostly Chiquitano mestizos and some Guarasug'wes (FAN, 2005). All of them speak Spanish, and have a passive linguistic knowledge of Guarasug'we or Chiquitano. The Chiquitano mestizos settled in the area in the 19th century. The Guarasug'wes (or Pausernas) presumably migrated from Paraguay to Bolivia during the 18th century (Riester, 1977), but they are currently close to extinction: there are altogether 31 Guarasug'we inhabitants in two communities, Porvenir and Bella Vista (Fig. 1).

Porvenir is highly isolated from the external world, as the nearest relatively large settlement, San Ignacio de Velasco, with about

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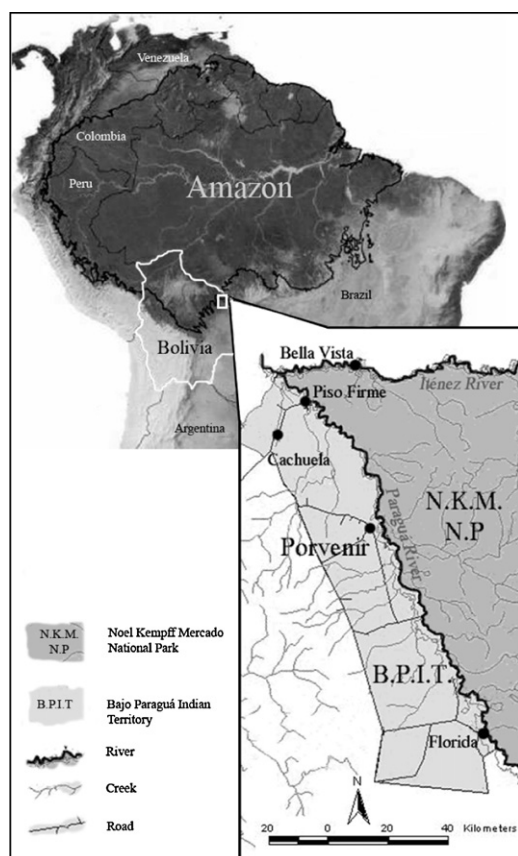


Fig. 1. Location of the study. Geographical coordinates of Porvenir: 13°59'13"S, 61°32'30"W.

The map of the Amazon was made with the use of the map downloaded from the web page of the Amazon Tour, and the map of Bajo Paraguará was made with the use of the map from the book by I. Vargas (2003).

23 000 inhabitants, is roughly 12 h away by coach. Coaches go once a week. The villages communicate with each other and with San Ignacio de Velasco by radio or from public telephone call boxes. A proportion of the young people go to study or to work to San Ignacio, where some of them found a family and remain, but they generally maintain connections with their native places, and there is therefore a continuous coming and going between the town and the villages.

Bajo Paraguará is located on the border of the tropical rainforests and the *cerrado* biome, the vegetation therefore being typical of the south-west Amazonian forest and the inundated savanna. The flora has not been studied thoroughly; there are data only on the flora of the Noel Kempff Mercado National Park, which borders on the TCO, and which is one of the most extensive ecological reservations in the world, with a surface of 1 523 446 ha. 2705 plant species have been described in the national park, but a total of around 4000 species is estimated (Killeen and Schulenberg, 1998). Only one ethnobotanical work has been published on the region (Vargas and Jordán, 2003), with information concerning 36 medicinal plants used in four of the communities, with the exception of Porvenir. Porvenir is situated on the border of the rainforest, which is secondary woodland, and the savanna, close to the Paraguará River, and thus the locals can easily benefit from the natural resources provided by these ecosystems.

The typical duties for the men in Porvenir include working on their *chaco* (hand-tilled land), keeping cattle, hunting and fishing, while the women have to do everything around the house. The people of Bajo Paraguará have traditional rights over 91 000 ha of forest. Since 2004, the WWF has been working with the Central Indígena

del Bajo Paraguará (Indigenous Council of Bajo Paraguará) to strengthen the forest management and market linkages. This has had a well-observable influence on the life of the inhabitants of Porvenir. Men have started to work in different wood-working plants of the TCO, and to earn significant incomes, resulting in economic development and considerable changes in their lifestyle.

The TCO has one physician, who lives in the largest community, Piso Firme, and visits the other villages about once a month or in the event of emergency. There is a nurse too, who lives in Porvenir, but the inhabitants prefer their own, traditional medicine and contact the nurse merely secondarily, or the physician only in grave cases. There is one traditional healer in the community, but he is known as a "black healer", and is therefore not too popular. The majority of the inhabitants who are advanced in years tend to make use of self-therapy. The knowledge on the application of medicinal plants has been handed down to them orally, from generation to generation, but is influenced by Bolivian folk medicine and conventional therapy from San Ignacio de Velasco too.

The aim of this work was to describe the traditional medicine utilized in Porvenir, and to find plant species which may be worthy of further phytochemical and pharmacological investigations. The results of the fieldwork are discussed in detail: accounts of the lifestyle and beliefs in Porvenir, botanical data regarding the plants used, the diseases that occur and their possible treatment, methods of plant application, frequency and variety of use, and some species and formulas are also presented. Ethnopharmacological data collected from the scientific literature on the plants used in Porvenir are presented. Comparison of the phytochemical and pharmacological data with ethnopharmacological information allows a more complex evaluation of the plant species. The results of the comparison of the literature and the folk-medicinal data on 24 promising species are discussed.

2. Materials and methods

2.1. Fieldwork

Permission from the authority of Porvenir to perform this study was obtained, and an international contract was then signed between the National Herbarium of the Noel Kempff Mercado Natural History Museum, the Indian Centre of Bajo Paraguará (CIBAPA), the Foundation Friends of Nature, Bolivia, and the University of Szeged, Hungary. Permission to collect botanical specimens and to deposit them at the Natural History Museum was granted by the CIBAPA.

Fieldwork was conducted by the first author for 5 months, between September 2004 and June 2005, in two phases, partly in the dry and partly in the humid season. The first month involved familiarization with the field, and participant observation and informal interviews with the inhabitants, which was important in order to establish the basis of cooperation.

In order to collect information relating to traditional medicine, inhabitants of the community were requested to identify the people with a deep knowledge of medicinal plants. 16 adult people, some Guarasugwes and some Chiquitano mestizos, from 16 different families, were selected to participate in semi-structured interviews with open questionnaires. The information recorded included personal data, the vernacular names of the medicinal plants used in Porvenir, the parts used, the plant habits, the modes of preparation and application, the formulas, the doses and the therapeutic purposes.

Two samples of each plant were collected with the participation of the interviewed subjects. The specimens were dried in Porvenir with the aid of a hand-made drying box, utilizing the heat of the fireside in a kitchen. Pictures of the collected material were also taken.

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