



# An ethnobotanical study of medicinal plants and traditional therapies on Batan Island, the Philippines

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## ARTICLE INFO

### Article history:

Received 9 June 2012

Received in revised form

15 November 2012

Accepted 18 November 2012

Available online 23 November 2012

### Keywords:

Medicinal plants

Ethnomedicine

Batan Island

Informant consensus factor

Fidelity level

Use value

## ABSTRACT

**Ethnopharmacological relevance:** We studied the local knowledge and uses of medicinal plants among the Ivatan people of Batan Island by documenting their traditional practices.

**Aim of the study:** To identify the types of medicinal plants used in self-care by the indigenous people of Batan Island, the Philippines and to investigate the extent to which the plants are used. Conservation of medicinal plants and natural resources is becoming increasingly important; thus, this research aims to collect information from local people concerning the use of medicinal plants on Batan Island.

**Materials and methods:** A total of 116 informants were interviewed, allowing for calculated informant consensus factors (ICF), use value (UV), and fidelity levels (FL) for each medicinal plant species used to cure various ailments. This helped to establish a consensus on which species are effective for particular ailments, as well as the species' relative importance, and enabled us to understand the extent of the potential utilization of each species.

**Results:** We describe the therapeutic effects of 112 plant species used medicinally against 13 categories of ailments. The highest ICF value (1.00) was cited for diseases of the ear and respiratory system and for use during pregnancy, childbirth and the postnatal period. The maximum FL of 100% was found for *Carica papaya*, *Stachytarpheta jamaicensis*, *Musa sapientum*, and *Pedilanthus tithymaloides*, used for the treatment of constipation, cuts and wounds, diarrhea, and dislocations and fractures, respectively. The highest UV was for *Hibiscus rosa-sinensis* (0.67). All plants with high UV were used for exogenous diseases, certain infectious and parasitic diseases, injuries, poisonings and other consequences of external factors, and diseases of the skin and subcutaneous tissues. In addition to its use for endogenous disease and lifestyle-related diseases and illnesses, *Moringa oleifera* is also used for diseases of the circulatory system, with a UV of 0.57 and *Cocos nucifera* is used for diseases of the genitourinary system, with a UV of 0.56.

**Conclusions:** This study demonstrates that many plant species play an important role in local healing practices and that knowledge of traditional medicine is still utilized and plays a significant role on Batan Island. The documentation of this rich traditional ethno-medicinal knowledge has furnished us with novel information that not only will provide recognition of this undocumented knowledge but also could provide new avenues for pharmacological investigations to improve healthcare for a range of ailments.

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## 1. Introduction

Medicinal plants have been used for treatment since ancient times and are still in use all over the world. Of the 422,000 flowering plants found globally (Govaerts, 2001), more than 50,000 are used for medicinal purposes (Schippmann et al., 2002). The practices of plant-based traditional medicine are based on hundreds of years of belief and observations, which predate

the development of modern medicine (Aburjai et al., 2007). Batan Island in the Philippines is rich in wild resources including varied flora because of the Kuroshio Current's warm and rainy climate (Top, 1992). Moreover, the Kuroshio Current is known as a north-south route for the transmission of a variety of plant resources and knowledge of herbal therapies. Additionally, 129 of the 529 plant species on Batan Island were on Ryukyu Island in Japan (Hatusima, 1966). It is believed that there are more than 700 species of flowering plants on the Batanes Islands, and that, remarkably, these contain a high percentage of endemic species. At least 251 species of flowering plants have been found on Batan Island, 42 of which are endemic to the Philippines and seven to

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Batan Island. The local Ivatan people reportedly use 138 different species of plants for foods, medicines, and other uses (Batanes Protected Lands and Seascape, 2001).

The Ivatan people make their living mainly through agriculture and fisheries, with the main crops of the region being root crops such as yam (*Dioscorea alata*; “uvi,” “dukay”), sweet potato (*Ipomoea batatas*; “wakay”), and taro (*Colocasia esculenta*; “sudi”). The Ivatan people share cultural commonalities with the Yami people of Orchid Island, Taiwan, with whom they have interacted since ancient times (Kano, 1946). Because of Batan Island’s isolation between the Philippines and Taiwan, its rich flora and unique traditional culture have remained intact. However, in recent years, with further economic development in the Philippines, the nature of healthcare has turned towards Western medicine. The rapid disappearance of traditional culture and natural resources due to urbanization suggests that unrecorded folk knowledge and information may be lost forever. Hence, there is an urgent need to systematically document the medical practices of Batan Island. Traditional and folk medicines have served as the means of immediate therapy to maintain the health of people living in such dispersed island areas. The conservation of ethnobotanical knowledge is becoming increasingly important; thus this research aims to document the use of medicinal plants and healing practices on Batan Island, identify the most important species, determine the relative value of species and calculate the informant consensus factors.

## 2. Materials and methods

### 2.1. Study area

This fieldwork was undertaken with the aid of the Ivatan community on Batan Island of Batanes, the Philippines. The Batanes Islands are located approximately 162 km north of Luzon Island in the Philippines and 100 km south of Taiwan and have a total area of approximately 209 km<sup>2</sup>; they are the northernmost part of the Philippines and it is the smallest province in terms of both population and land area. The study site, Batan Island, is composed of four municipalities, Mahatao, Ivana, Uyugan, and Basco, the provincial capital. The indigenous people of Batan Island are Ivatan and number approximately 11,440 according to the 2007 Philippine Census (Philippine National Statistics Office, 2007). There is only one hospital and one doctor’s office,

referred to as the clinic, and this is in Basco. The hospital is the only health institution that can manage surgical and obstetric emergencies. Typically, local people visit the health center in each municipality to address their health concerns instead of visiting the hospital. Only when they cannot be treated at the health center do they choose to visit the hospital. On the entire island, 14% of the population has access to health facilities. All residents have access to sanitary toilet facilities and safe drinking water, and 90.2% have electricity. Annual income levels are lower than in other regions of the Philippines (Philippine National Statistics Office, 2007).

### 2.2. Data collection

Fieldwork was carried out for a total of six weeks in 2008 and 2009 on Batan Island. The work consisted of interviews, plant observations, and the collection of medicinal plants in four different sites: Basco, Mahatao, Ivana, and Uyugan (Fig. 1). We interviewed 116 local people on Batan Island (58 female and 58 male, aged between 20 and 93, with the median age being 54) from Basco ( $n=30$ ), Mahatao ( $n=26$ ), Ivana ( $n=29$ ), and Uyugan ( $n=31$ ). The data were collected through semi-structured interviews with residents and informal conversations with medical personnel from Batanes General Hospital, the clinic in Basco, and the Uyugan health center, using either English or Ivatan. The informants were asked about their knowledge of the plants they used to combat disease, the parts of the plant used, the modes of preparation, and details concerning how each plant is administered to patients, how such knowledge is obtained and transmitted, the frequency of use, the responses of patients who compare plant remedies with Western medicine, and how easy it is to find the necessary plants. The informants were selected randomly and no appointments were made prior to the visits. The plants were collected, pressed and dried in the field and the voucher specimens were later deposited at the Kochi University Herbarium. The plants’ vernacular names were collected with the help of local people. Scientific names were determined by identifying herbarium species and checked against references in the *Dictionary of Philippines Plant Names* (Madulid, 2001). Scientific names of plants were determined using *The Plant Names Index* (IPNI, 2004). The paired-sample *t* test was used to determine whether there were significant differences between known medicinal plants and those actually used. All of the analyses were conducted using the Excel 2003 software package for Windows.

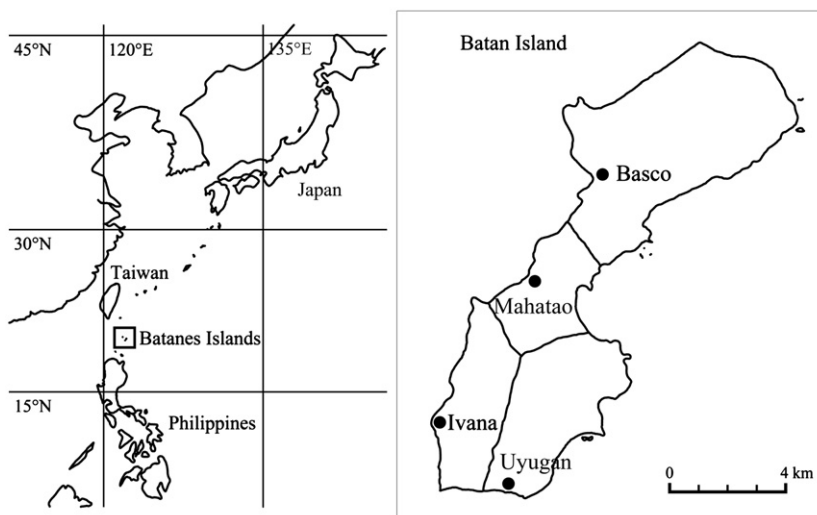


Fig. 1. Study sites (●) in Batan Island, the Philippines. The lines are divided into four municipalities; Basco, Mahatao, Ivana and Uyugan.

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