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Ethnobotanical Survey among Farmers in Leyte, Philippines, and Comparison with Indigenous Filipino Plant Lore

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Abstract

Presented are the results of ethnobotanical field work among members of Cienda San Vicente Farmers' Association (CSVFA) who are involved in community-based forest management on the foothills of Mt. Pangasugan on the island of Leyte, Philippines. The farmers' knowledge on useful plants is compared to that of four indigenous groups from the Philippines. Overall, 123 plant species belonging to 90 genera and 53 families were recorded to be used by the farmers for 77 different purposes including 42 human ailments. The predominant lifeforms are trees and herbs and more than 60% of all recorded species are native to the Philippines. Many species are used for more than one purpose: 80 plants have medicinal value, 34 provide food and 32 serve for other uses. For the indigenous people mainly plant species utilised as food and construction material are recorded. Perhaps as a consequence of different species composition in the respective regions, less than 15% of the plant species recorded for each indigenous group are also used by the farmers in Leyte. Some medicinal plants are used in the same way by the indigenous and non-indigenous people in the Philippines indicating that their use is based on pharmacological activity. The recorded plant resources could serve as an alternative source of income by integrating such plants into sustainable land use systems. In conclusion, CSVFA farmers use a diversity of plants and have acquired a high degree of knowledge on useful plants within their environment. The present study provides a base for enhancing scientists' attention towards consideration of non-indigenous rural folks as source of ethnobotanical knowledge.

Introduction and Objectives of the Study

Rapid population growth, commercial logging and scarcity of alternative agricultural lands have led to a drastic reduction of forest cover in the Philippines during the last decades. At the same time, the Philippine archipelago is one of the most important biodiversity hotspots on earth, providing among others habitat for almost 8900 vascular plant species (Davis et al. 1995) and more than 500 endemic vertebrate species (Myers et al. 2000). The island of Leyte clearly represents this ecological situation: about 40% of the island are occupied by degraded lands, 40% consist of coconut plantations (DENR 1998) and only 2% of the land area is still covered with pristine forests (Dargantes and Koch 1994). Langenberger et al. (2005) state that more than 50% of recorded plant species of Mt. Pangasugan forests on the island of Leyte are Philippine endemics, many of which are considered endangered.

The members of Cienda San Vicente Farmers' Association (CSVFA) are part of a community-based forest management agreement which involves the responsibility of protection and sustainable use of the assigned forests. In most cases, ethnobotanical research focuses on

indigenous people while the knowledge of traditional agriculturalists and forest dwellers is neglected. Two studies (Noriel et al. 1998; Lacuna-Richman 2002) exist for the research area of Mt. Pangasugan vicinity. However, these studies focus on socioeconomic aspects of collecting non-timber forest products (Lacuna-Richman 2002) and on documentation of plants with pesticidal and medicinal properties (Noriel et al. 1998). Thus, they do not represent a comprehensive base of the farmer's ethnobotanical knowledge.

Therefore, the objectives of this study were i) to record local uses of wild plant species in order to document the knowledge of farmers in the study area, ii) to identify recorded plant species and, thus, link local and scientific names for facilitating literature reviews, and iii) to evaluate farmers' knowledge in comparison to that of different Philippine indigenous groups.

Methods

The study area is located about 8 km north of the municipal town of Baybay on the western foothills of Mt. Pangasugan, Leyte, Philippines. Mt. Pangasugan vicinity represents one of the few remaining patches of pristine forests on the island of Leyte. The annual average temperature and precipitation are 27.4°C and 2586mm, respectively (Langenberger et al. 2005). The farmers who participated in this study reside in communities Gabas and Kilim. Inhabitants of the area do not belong to an indigenous people as defined in the Indigenous People's Rights Act by the Philippine government (NCIP 2005).

Data collection on ethnobotanical knowledge was carried out from September to November 2004 through interviews with six male key informants using a semi-structured questionnaire. Cultivated crops were only considered if they were attributed an alternative use. Subsequently, recorded plant species were collected and prepared for display at Leyte State University's Herbarium. Results of this study were finally compared to the ethnobotanical knowledge documented for the indigenous Ifugao (Conklin 1967) and Bontoc (Bodner & Gereau 1988) from Luzon as well as Mansaka (Abrams 1961) and Tasaday (Yen & Gutierrez 1974) from Mindanao.

Results and Discussion

Comparing the findings of this study with those from other ethnobotanical surveys in the Philippines needs to overcome some difficulties. First, some studies cover all useful plants including purchased and crop plants (i.e. Conklin 1967; Bodner & Gereau 1988; Yen & Gutierrez 1974; and Abrams 1961) while this study focuses on non-cultivated wild plants and has not recorded any crops unless they also had an alternative use. Second, some studies do not provide the exact applications of medicinal species (i.e. Lacuna-Richman 2002; Conklin 1967) which make comparisons less accurate. Despite these restrictions, Table 1 summarises the ethnobotanical knowledge of farmers in Mt. Pangasugan vicinity and of the indigenous people Ifugao, Bontoc, Mansaka and Tasaday. Although they lack the methodological ethnobotanical background, results of surveys (Noriel et al. 1998; Lacuna-Richman 2002) on non-timber forest products in the study area have been included in order to supplement the ethnobotanical knowledge of non-indigenous groups in Leyte in comparison to the indigenous people.

Farmers in the study area use a taxonomically diverse group of plants representing 123 species, 90 genera and 53 families. The majority of recorded plant species are trees (57%) and herbs (27%) and 62% of the identified species are native to the Philippines. The number of species recorded among CSVFA farmers (123) can be ranked in the lower midfield with Bontoc species (325) ranking first, followed by Tasaday (210), Mansaka (205) and Ifugao (156) (Table 1). Considering the large number of species for which no use was recorded in the other studies, the ethnobotanical knowledge of CSVFA farmers is as diverse as that of indigenous groups, which is a remarkable effort taking into account that they have been exposed to modern

commercial commodities at a much higher rate than have the indigenous people. Members of the families Euphorbiaceae, Asteraceae, Poaceae, Moraceae and Leguminosae are the most frequently recorded families throughout all studies. However, Dipterocarpaceae are the second most frequently recorded family among species documented for Mt. Pangasugan vicinity while only in two cases (Abrams 1961; Yen & Gutierrez 1974) Dipterocarpaceae are mentioned to be utilised by the indigenous people (for building and firewood). No dipterocarps were recorded for the Ifugao and Bontoc from Luzon (Conklin 1967; Bodner & Gereau 1988) which may be a consequence of the absence of dipterocarps in the mountain forest vegetation of Luzon's Central Cordillera region due to climatic conditions and high altitude.

Table 1: Comparison of number of useful plant species recorded for farmers in Mt. Pangasugan vicinity with results from six ethnobotanical studies from the Philippines and percentage of species overlap.

	CSVFA* this study	Baybay Noriel et al. 1998	Cienda Lacuna-Richman 2002	Ifugao Conklin 1967	Bontoc Bodner & Gereau 1988	Mansaka Abrams 1961	Tasaday Yen & Gutierrez 1974
Species	123	54	35	156	325	205	210
Medicinal species	80	47	10	22	53	21	2
Food species	34	6	21	56	102	31	42
Species for other uses	32	8	5	58	153	84	109
No use recorded	-	-	-	32	102	78	90
Species in common**	-	50%	34%	7%	9%	12%	3%

* Cienda San Vicente Farmers' Association

** Percentage of species recorded for CSVFA farmers and the corresponding indigenous and non-indigenous people

Multiple use of plants is common among CSVFA farmers in Mt. Pangasugan vicinity. Eighty species have medicinal value, 34 are food plants and 32 species are used for other purposes such as construction (Table 1). Among the indigenous people most species were recorded to be food plants and plants used for various other purposes (mainly construction and crafts) (Table 1). Since most indigenous people used to live considerably isolated from the mainstream society, they heavily relied on natural products for food and construction. This may explain the large number of species in these categories among Bontoc, Ifugao, Tasaday and Mansaka, while farmers in Mt. Pangasugan area mainly use wild food plants as food supplements like spices or candies or as substitute if staple food sources are scarce. Moreover, especially the Ifugao use many plant species to make clothes whereas CSVFA farmers only knew about one species for that purpose which may be explained by their preference of commercially traded clothes. However, one needs to take into account that most studies on indigenous people's knowledge have been carried out more than 30 years ago. Since then they have been exposed to modern 'civilization' as well which may also have altered their habits of clothing etc.

The number of species with attributed medicinal properties varies significantly: the Bontoc use 53 species while for the Tasaday only two species are recorded for that purpose (Table 1). In contrast to that, the pharmacopoeia of CSVFA farmers (80 species) clearly ranks first with more than twice as many species as recorded among the indigenous groups except for the Bontoc (53 species) (Table 1). One reason for the comparably small number of medicinal species used by the indigenous people may be that they were not willing to share their information on medicinal plants with foreign researchers. Overall, the farmers use herbal remedies for 42 human ailments. Although the basic ailments are similar, only few species (Table 1) are shared between CSVFA farmers and indigenous people and even less species are used in the same way (data not shown). This may be explained by different species compositions in the respective biogeographic regions. In contrast, the studies conducted in Leyte (Noriel et al. 1998; Lacuna-Richman 2002) show a large overlap of useful species (Table 1) with CSVFA farmers which can be explained by the close proximity and a similar species inventory. The fact that almost half of all species that farmers from Baybay and CSVFA have in common are also used

for the same medicinal application (data not shown) supports the assumption that their use is based on some bioactive principle.

Conclusions

Farmers in the study area neighboring Mt. Pangasugan's pristine forests have obtained a remarkable knowledge on local useful plants. While ethnobotanical research is usually focused on the originally isolated indigenous people, the results of this study suggest that rural folks should also be considered and can be an important source of information about the use of plants. This knowledge, however, depends on the presence of the respective plants. Thus, biodiversity conservation and habitat protection are a prerequisite for conservation of ethnobotanical knowledge. In turn, distribution of the knowledge may not only contribute to improved healthcare and supply with goods for sustenance but also to the creation of environmental awareness that will encourage local residents to protect their biological heritage.

Due to properties inclucing shade-tolerance and sufficient adaptation to forest environments, many plants recorded among CSVFA farmers may have potential for being integrated into alternative land rehabilitation systems such as Rainforestation Farming (for review see, for example, Göltenboth & Hutter, 2004). In case of an existing market value these plants could serve as an additional source of income for farmers.

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References

Abrams, N. (1961). A short list of Mansaka flora and their uses. Philippine Journal of Science 90(1):25-36

Bodner, C.C. and R.E. Gereau (1988). A contribution to Bontoc ethnobotany. *Economic Botany* 42(3): 307-369

Conklin, H.C. (1967). Ifugao Ethnobotany 1905-1965: the 1911 Beyer – Merill report in perspective. *Economic Botany*: 243-272

Dargantes, B.B. and W. Koch (1994). Case studies on the occupation and cultivation of the forest lands of Leyte, Philippines. Annals of Tropical Research 16:13-29.

Davis, S.D., V.H. Heywood and A.C. Hamilton (eds.) (1995). Centres of plant diversity: a guide and strategy for their conservation. Vol. 2. Asia, Australasia and the Pacific. IUCN Publications Unit, Cambridge, UK.

DENR (1998). Philippine atlas. Department of Environment and Natural Resources (DENR), Quezon City.

Göltenboth, F. and C-P. Hutter (2004). New options for land rehabilitation and landscape ecology in Southeast Asia by "rainforestation farming". *Journal for Nature Conservation* 12: 181-189

Lacuna-Richman, C. (2002). The socioeconomic significance of subsistence non-wood forest products in Leyte, Philippines. *Environmental Conservation* 29(2):253-262

Langenberger, G., K. Martin and J. Sauerborn (2005). Vascular plant species inventory of a Philippine lowland rainforest and its conservation value. *Biodiversity and Conservation* (online July 1, 2005)

Myers, N., R.A. Mittermeier, C.G. Mittermeier, G.A.B. Da Fonseca and J. Kent (2000). Biodiversity hotspots for conservation priorities. *Nature* 403: 853-858

National Commission on Indigenous People (NCIP), http://www.ncip.gov.ph/mandate/ipra.htm, April 23, 2005

Noriel, L.M. et al. (1998). Ethnobotanical knowledge of farmers in Baybay, Leyte, Philippines. In: Göltenboth, F., P.P. Milan und V.B. Asio (eds.) (1998). Proceedings of the International Conference on Applied Tropical Ecology held September 8-10, 1998 at ViSCA, Baybay, Leyte, Philippines.

Yen, D.E. and H.G. Gutierrez (1974). The ethnobotany of the Tasaday: the useful plants. *Philippine Journal of Science* 103(2): 97-139