

## Ethnobotany : Exploring Traditional Medicine Plants

Rina Ratnasih Purnamahati  
Lecturer of Institute of Technology, Bandung, Indonesia



### Introduction

Human depend on plant products for their daily life to fulfill their need, such as for cloths, food, and industrial chemicals. It is estimated that a number of species of flowering plants in the world is about 250000 or more, conifers and cycads 700, ferns and horsetails 12000, mosses and liverworts 22000, algae 2500. About 75000 of the world plant species are believed to be edible, however only 30 plant species provide 90% of the global nutritional requirement. Many of plants species are exploited not only for food, but also extracted for biological activities such as insecticides and fish poisons, plant medicines, food preservatives and flavour compounds. Plants also can provide raw materials for fragrance and cosmetic industries, as well as for alternative sources of fuel, rubber, plastics and a large number of other valuable commodities. The specialized biochemical pathways of plants also has direct value in agricultural, eg. the nitrogen-fixing properties of legumes to enrich soils with valuable nitrates. Certain plants also can be used to detoxify heavy metals, such as *Eichornia crassipes* (water hyacinth).

The relation between plants and people, developed many branches of human knowledge e.g. history, anthropology, botany, ecology and ethnobotany. Ethnobotany can be defined as the science that studies and interpretes the history and the relation of plants in “antique” and actual societies. Most people think ethnobotany as the study of plant use by indigenous or traditional people. However, ethnobotany is not limited to the study of traditional people but also it is studied all human-plant interaction.

Ethnobotany gives value to peoples in traditional knowledge and understanding of their cultures, and also the practical use of plants. Ethnobotany also collaborates to value knowledge and community in traditional medicine. There is more interest in ethnobotany today, than at any time in the past since a lot of plant use for human purposes. However, since the early

1990s, conducting ethnobotanical research in developing countries has become increasingly difficult. This is due, in large part, to paranoia about traditional knowledge and intellectual property rights (Cotton, 1996). Aculturation, loss of indigenous languages, and forest conversion threaten the fate of ethnobotany.

Indonesia as the one of the country located in the equator has an advantages of the richness of plant diversity. The plant megadiversity would benefit for Indonesia's people if manage well. There are a lot of research to do. The first step is Indonesia should have a database regarding plant species by exploring 13,000 islands we have, and then identified the prospect species to fulfills a basic need of the people for food, health and housing. This presentation will focus on ethnobotany research conducted in our group in School Life Sciences and Technology including bioprospecting of potential medicinal plants, jamu, a traditional medicine in Indonesia and a study of plants used as medicine herbs in Kampung Naga.

### **Bioprospecting potential medicine plants**

#### **White lily (*Crinum asiaticum* L )**

White lily has been known as traditional medicine to cure high fever. Isolated secondary metabolite, called galanthamine from its tuber has been researched to cure Alzheimer's disease or a brain disorder. Previous studied showed that galanthamine more effective for treating Alzheimers disease than physostigmine and tacrine, a chemical usually used. The purpose of our study was to obtain the highest of galanthamine by exploring and sampling white lily from different altitudes. Our study showed that galanthamine content in the bulb of *Crinum asiaticum* in nature tend to be affected by environmental conditions such as altitude, soil organic and nitrogen content in the soil. Therefore, to gain high concentration of the compound, it should consider the habitat of *Crinum asiaticum* (white lily) grow.

#### **Tongkat Ali or Pasak Bumi (*Eurycoma longifolia*)**

Tongkat Ali or Pasak Bumi (*Eurycoma longifolia*) has become popular for its so-called testosterone-enhancing productivity. It has therefore been included in some herbal supplements for male in Southeast Asian. The plant species used traditionally to enhance energy levels, endurance and stamina, and to reduce occasional mental fatigue. Pasak bumi only grow in the region of South East Asia, i.e in Myanmar, Malaysia, Thailand and in some part of Indonesia, i.e Sumatera and Kalimantan. It has been studied that pasak bumi contain chemical compound, called quasinoid, squalene, triterpenoid extracted from the roots. In jamu production the chemical active is isolated from the roots. The jamu producer buy the simplisia from the traders who took from the forests. The problem is sometimes the traders

mix the roots and the stem since the root hard to get. Our study was emphasized to formulate a simple method to distinguish between the pure and mix simplisia based on morphology and anatomy perspectives. Under microscopy observation, the structure can be distinguish between stem and root and lead to a conclusion that the simplisia has been mixed with stem, although within small proportion.

### **Jamu, a traditional medicine in Indonesia**

Jamu is traditional medicine in Indonesia made mainly from plants material (root, leaves, flower, fruit or bark) distributed in the form of powder (pills or capsules), or liquid. Jamu recipes can be traced to the ancient royal families of Solo and Yogyakarta in Central Java, where elaborate health and beauty treatments were a part of their daily life. The most popular treatments are for routine complaints like fatigue, muscle and joint pain, infertility, high cholesterol, skin problems, and indigestion. The treatments included massage as well as lotions and potions to keep, especially women, healthy and youthful, give them glowing skin and hair, and retain their slim figures.

The receipe of jamu may vary. However, there are some plant material that usually used as ingredients, such as ginger (*Zingiber officinale*), Java tumeric (*Curcuma xanthorrhiza*), tumeric (*Curcuma domestica*), Java galangal (*Alpinia galanga*), leaves of sappan (*Caesalpinia sappan*), bark of heartleaf moonseed (*Tinospora crispa*), fennel (*Foeniculum vulgare*), Fruits of lime (*Citrus aurantifolia*), barks of Cinnamon (*Cinamomum burmanni*), Flowers of Jasmine (*Jasminum sambac*), kunai grass (*Imperata cylindrica*). The receipe is not written down, but handed down between generations by oral communication. Jamu usually prepared and prescribed by women, and then sold it in a very small industry.

Historically, one of the first European physicians who studied jamu was Jacobus Bontius, a physician from Batavia in the early seventeenth century. Then, a comprehensive book on indigenous herbal medicine in the Indies was published by Rumphius, who worked on Ambon during the early eighteenth century. He published a book called *Herbaria Amboinesis (The Ambonese Spice Book)*. Recently, the popularity of jamu increased, although physicians had rather ambivalent opinions about it. Nowadays, homemade jamu is becoming less common, but the herbal medicine and cosmetics industry has greatly expanded. Our research was focused on Jamu Madura, which popular as a special jamu to increase male vitality. The reasearch was done in Pamekasan District, Madura Island. Based on our study it was revealed that not many young generation drink jamu. One of the reason was a bitter taste. However, jamu were still popular among women which used before wedding and after give birth. We

discovered also that plants material for jamu ingredients did not easy to find since not many people grow those plants. They had to buy the material from the market which supplied from other places in Indonesia. This can cause the price of jamu become more expensive and lead to less competitive compare to jamu made in Java island.

### **A study of plants used as medicine herbs in Kampung Naga**

A study have been done in Kampung Naga to analysis the plants used by the community as medicinal herbs to treat some health problem. Kampung Naga administratively located in the area of Neglasari Village, Salawu Ddistrict, Tasikmalaya, and West Java and has become a tourism destination. The community is living in a simple traditional way and environmental friendly. The village is located in a valley. There is stone steps to the bank of the river Ciwulan with the slope of 45 degrees with the length of 500 meters to get there. In the west of the village, there is Naga forest which is sacred. Inside the forest there is an ancestral cemetery. In the south of the village, there is the paddyfields, while the north and east are bordered by river Ciwulan.

Kampung Naga is a village which is inhabited by a community in a very strong tradition. Around 150 families of Sanaga (Naga residents) or 314 people are still hold the customs and traditions inherited by their ancestors. One of a tradition is the arrangement of the house in the village. There are only 112 buildings, consists of 109 houses, a mosque, a village hall, and a rice barn. The houses are all the same and set face to face and consist of living rooms, family rooms, bedrooms and rice barns. In the living rooms, there is no chairs or tables and only have mats. The family room are furnish by nothing and only some houses have a television set. The toilets are apart from the houses built like small huts without any roof with platted-bamboo walls. In a house, there is usually a bedroom or two, depending on the family members. Each house has its own rice barn to store rice. The houses made of bamboo, wood, and roofed with palm leaves. The shape of the houses is similar with the size of 5 x 8 meters. This similarity is a symbol of togetherness and simplicity. A land area in Kampung Naga is 1.5 hectare used for housing, yards, ponds, and paddy field and garden. The paddy field harvested twice a year.

At Kampung Naga, almost parts of buildings are made of the wood and bamboos. The walls, floors, windows, and door frameworks are made of wood whereas door and kitchen floor used bamboos. The roofs consist of two layers. The first layer, is made of '*Tepus*', dry platted leaves of sugar palm trees (*Arenga pinnata*). The second layer consist of arranged of '*Ijuk*', of sugar palm trees. '*Ijuk*' can least more than 20 years. '*Ijuk*' is a good for roof material, to keep

cool in dry season and warm in wet season. The floor is made of ‘Pelupuh’ flattened bamboos. The stove is called ‘*hawu*’, a traditional long firewood stove made of a clay. The simplicity is also reflected by the life without electricity. At night, they use a kerosene pressure lanterns, to light up the houses.

The value of local wisdom is also reflected in maintaining the environment of the river. Ciwulan River is none contaminated since they protect the forest in the upper river. Protection of water resources is part of the Sanaga tradition. In the study of Kampung Naga, Suandharu (1998), has identified 257 species grown around Kampung Naga village. The percentage of the plants utilisation was as follows, medicinal plants (44%), food (9%), vegetables (20%), fruits (6%), material for construction and fuel (19%), handicrafts (9%), equipment (9%), ritual (8%), poisonous (3%), forages (8%). In comparison to Kampung Pulo, located in the similar region, Kampung Naga have used more plants to heal health problem. However, both communities used similar plants such as *Curcuma domestica*, *Cymbopogon nardus*, *Averrhoa carambola*, *Zingiber officinale*, *Imperata cylindrica*, *Musa paradisiaca*, *Ageratum conyzoides*, *Persea americana*, *Bambusa* sp, *Allium sativum*, *Oryza sativa* as medicinal plants. The people in Kampung Naga’s community have the potential culture and botanical knowledge which can be developed further. Below is part of plants used as traditional medicine in Kampung Naga.

**Table 1. Plant species used in Kampung Naga’s community as medicinal herbs**

Name of plant species	Uses
Tumeric ( <i>Curcuma domestica</i> )	stomach ache, fever, cough, diare,
Guava ( <i>Psidium guajava</i> )	diare atau gastroenteritis, ulcer, pimpel, scratch
Citronella grass ( <i>Cymbopogon nardus</i> )	broken joint, coughing
Star fruit ( <i>Averrhoa carambola</i> )	hypertension, antioxidan
Coconut ( <i>Cocos nucifera</i> )	toxicant, fever, Influenza, toothache
Ginger ( <i>Zingiber officinale</i> )	anticcoagulant; decrease cholesterol level
Kunai grass ( <i>Imperata cylindrica</i> )	Hypertension
Garlic ( <i>Allium sativum</i> )	maintain blood glucose to prevent diabetes

**References**

- Cook, H.J. (2005). Global economics and local knowledge in the East Indies : Jacobus Bontius learns the facts of nature in Colonial Botany – Science, Commerce and Politics in the Early Modern World ed by Londa Schiebinger and Claudia Swan. University of Pennsylvania Press. Philadelphia.
- Cotton, C. M. (1996). Ethnobotany : principles and applications. John Wiley & Sons, Chichester ; New York
- Suandharu, H. (1998). Etnobotani Masyarakat Kampung Naga Tasikmalaya, Jawa Barat. Skripsi Sarjana Biologi. Institut Teknologi Bandung.