

A Glimpse of Vietnam's Forest Wealth and Medicinal Plants-Based Traditional Medicine

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ABSTRACT Vietnam's flora is very much in relation to its mountainous topography, geological formations, monsoon tropical climate and human interference. Certain genera and species being endemic to Vietnam have contributed to the formation of specific forest types and also to the variety of plant produce having immense commercial value. Innumerable plant species of medicinal importance, grown in wild or cultivated, sustained the rich legacy of traditional medicines. The medical treatises and documents testified to the efficacy of traditional medicine in terms of preventive and curative aspects. Vietnam's traditional medicine, which has been for over centuries popularized among the masses, is recently institutionalized for improving the methods of diagnosis and treatment as well as sharing the expertise with other systems of medicine. Vietnam's plant drugs, which are found more effective than the Western medicines in treating certain chronic diseases, are exported in large quantities to other countries. Yet, Vietnam's traditional medicine enduring certain deficiencies looks for the scientific and technical assistance from other countries like India.

THE PHYSICAL BASE

Vietnam is located in the tropical monsoon belt characterized by rainy summers (all over the country), and dry winters (in the southern part) or a cold and drizzling prone winter (in the northern part). Although tropical humidity tends to dominate the climatic pattern, there are seasonal variations in climate well-pronounced, thanks to the Vietnam's geographical location as being both continental and maritime. Its north-south elongation (1600 km) over 15° of latitudes (8° 30' N – 23° 22' N) is a factor for gradual decrease of temperature towards the north setting in sub-tropical situation. It is the high altitude that brings in a zone of temperate climate on the peaks of mountains rising more than 1000 metres above the mean sea level. Thus, the areas of higher latitudes and altitudes generally encounter severe winters accompanied by frost and snowfall or mere cold dry weather conditions. About the same time, Vietnam experiences the brunt of natural calamities: if its coastal fringe is battered by the floods (especially during the period of cyclonic storms from the South China Sea), the interior areas are prone to droughts (owing to the rain shadow effects caused by criss-cross configuration of mountain ranges). Vietnam, which is located at the crossroads of Asian monsoons, records an average annual rainfall of 1960 mm, as observed from the data of 25 years (1960 – 1985) compiled by Nguyen Van Troung (1996: 6).

Vietnam, stretching over 7° longitudes (102° 10' E - 109° 30' E) is sandwiched between the Annamite mountain chains (forming its western boundary with Laos and Cambodia over a length of about 2500 km) and the South China Sea (with a long coastline of 3000 km). This sort of territorial configuration has made Vietnam a cripple of restricted spatial mobility in east-west direction, with wide variability in the width ranging from 50 to 600 km. This geographical inertia has impinged on the spatial pattern of land use with limited scope for furthermore expansion of cultivable land than the present extent of about 8.25 million hectares (m.ha.), which account for about 25 per cent of total geographical area of 32.9 m.ha. (329,600 sq. km).

VEGETATION TYPES

Topography and climate together with geology have brought in changes in the soil conditions; and their combined influence is well evident on the vegetation types and floristic composition. Further and more complexity is manifested in the Vietnam's flora as a result of southward extension of the flora of the South China and the Himalayas (Fisher, 1969: 43; Nguyen Dinh Hung, 1996: 59). Despite the predominance of Asian vegetation types, many Australian varieties have also spread over this region that forms a part of the major Indo-Malayan plant realm. Much in tune with the Vietnam's distinction of being the most ancient

cradles of human settlement and biological world, its flora is also termed ancient on the basis of survivals of such plant species that belonged to different periods of geological history (Nguyen Dinh Hung, 1996: 57&60; Nguyen Ngoc Lung, 1992: 10). Vietnam in early 1990s is reported to have had a forest cover 93,000 sq.km, including man-made forest cover of 10,000 sq.km. accounting for about 28 per cent of the total geographical area of 329,600 sq.km. (Nguyen Van Troung, 1996: p.10; Nguyen Ngoc Lung, 1992: 10). Of the common forest types, mixed evergreen and semi-deciduous broad-leaved forest type is a dominant one occupying an area of about 52,000 sq. km, followed by deciduous broad-leaved forest (9,350 sq. km), bamboo forest (8,160 sq. km) and mixed hardwood / bamboo forest (6,190 sq. km). As per the 1991 project, *Forestry Sector: Tropical Forestry Action Plan*, Vietnam forests are also classified as economic forests (having an area of 62,230 sq. km), protective forests (23,670 sq. km) and specialized preserves (7,260 sq. km) (Nguyen Ngoc Lung, 1992: 10). But, there is a some degree of inconsistency in the extent of Vietnam's forest area, which is variously furnished even by the Vietnamese official sources as, for instance, *Vietnam Courier* and *Vietnamese Studies*.

Like its people who were prone to exploitation, Vietnam's forests had also been subjected to ruthless exploitation leading to the depletion of forest cover to about 41 per cent by 1943, further down to 29 per cent by 1975 and then to 24 per cent by the middle of 1980s. The decline in forest cover had largely been due to: the policies of the French colonial regime and the prolonged warfare over 30 years since 1945 especially during the 1960-75 period when the USA used defoliant toxic chemicals which became fatal to the entire biotic and abiotic environment; and the recent decline (to 24%) owes much to over-exploitation of forest resources, wild fires, pollution, lack of funding for environmental programmes, and Vietnam's urbanization, over-population growth, and Vietnam's lack of foresight of environmental degradation resulted from its land expansion programme at the cost of forest land (Nguyen Van Troung, 1996: 26 & 30; Pham Ngoc Dung, 1998: 57-79; Vo Quay, 1990: 40-42; Vo Quay, 1998: 7-32; Yagama Reddy, 1988: 26-35; Yagama Reddy, 1999: 9-19). Vietnam forestry

contributes to 5.1 per cent of national income, besides providing employment to more than 1.0 million labour force engaged in forestry-based activities and operations such as extraction and transport of timber, product processing and trading and forestry management (Nguyen Van Troung, 1996: 20-22).

FLORISTIC ACCOUNT INCLUDING MEDICINAL PLANTS

The latest enumeration has furnished that Vietnam's flora comprises 7,044 species representing 1,850 genera and 289 families (Nguyen Ngoc Lung, 1992: 10; Nguyen Van Troung, 1996: 11). Its floristic strength (7,044 species) accounts for 3.2 per cent of 220,000 species of the entire globe (Nguyen Van Troung, 1996:18). Just as the variations in the extent of forest cover, there are variations in the floristic account. For instance, Tran Khac Bao (1995: 141), Vo Quy (1998: p.15) and Le Quy An (1998: 46) furnished a staggering figure of 12,000 plant species, while Le Dinh Kha and Nguyen Hoang Nghia (1996: 88) enlisted about 11,000 species. Although there are no endemic families, there are more than 250 endemic genes and about 450 endemic species reported from Vietnam (Nguyen Dinh Hung, 1996:59). There are some families rich in species as, for example, *Rubiaceae* (826 species), *Euphorbiaceae* (333) and *Asteraceae* (290). On the other, many families though composed of few species have, however, large number of individual species; in other words, the quantitative preponderance – generally expressed as density or abundance – of a single species has its influence on the structure of forest types. These include *Dipterocarpaceae*, *Lauraceae*, *Meliaceae*, *Fabaceae*, *Rhizophoraceae* and *Pinaceae*. About 1000 species known for their great economic value belong, mainly, to such families as *Fabaceae* (40 genera; 100 species), *Fagaceae* (5g, 100s), *Lauraceae* (15g, 78s), *Anacardiaceae* (18g, 56s), *Euphorbiaceae* (30g, 50s), *Dipterocarpaceae* (7g, 45s), *Sapindaceae* (12g, 40s), *Meliaceae* (12g, 30s), *Magnoliaceae* (5g, 25s) (Nguyen Dinh Hung, 1996: 58-59). These species yield good quality timber for a variety of commercial uses. Vietnam, according to its Forestry Minister, Phan Xuan Dot (1986:16), had in late 1980s an area of more than 14,000 sq. km. under bamboo forest with an estimated strength of 5.9 billion bamboo

trees representing a wide range of species. Of the total timber reserves of about 586 million cubic metres (m³) as estimated by Nguyen Ngoc Lung (1992: 10-11), about 13 million m³ timber was extracted during the 1986-90 period, while the total amount of fuel wood extracted was 148 million tons (Nguyen Van Troung, 1996: 27-28). Certain ancient and rare species, which are still survived, such as *Cephalotaxus hainanensis*, *Glyptostrobus pensilis*, *Pinus krempfii* and *P. dalatensis*, are of much interest to paleobotanists (Nguyen Dinh Hung, 1996: 60; Nguyen Ngoc Lung, 1992:10).

Besides being known for a variety of forest produce, Vietnam has 1,860 plant species of medicinal importance enumerated by the survey carried out over 25 years (1961-1985) by the Institute of Pharmaceutical Materials. Of which, 700 species are widely mentioned in Vietnamese traditional medicinal literature. While physicians use 150-180 vegetable ingredients, people use some 120 plants commonly grown in family gardens (Tran Khac Bao: 140-141). Many of the common medicinal plants grown in wild are yet to be enlisted. The Vietnam's Minister for Forestry, Phan Xuan Dot (1986:17), while dealing with the forest wealth and forest policy, quoted *Materia Medica* Institute under the Ministry of Health as having reported 1,498 plant species of medicinal importance. In the context of market economy, urbanization, demographic growth and expansion of agricultural land, medicinal plants grown in the family gardens have got dwindled; in several instances wild medicinal plants have been so much ruthlessly exploited as to face the threat of extinction. All along the process of discovering rare medicinal plants (like *Rauvolfia vomitoria*, *R. serpentina*, *Panax bipinatifidus* and *P. vietnamensis*), some wild plants are cultivated for the preparation of drugs. A few other exotic species of European / South American-origin are acclimatized as, for instance, *Angelica uchyamana*, *Rhemannia gentinosa*, *A. dahuria*, *Actractylodes macrocephala*, *Aucklandia lappa*, *Mentha arvensis*, *Achyranthes bidentata* and *Lugisticum wallichii*. Chief among the plant drugs annually produced are: *Curcuma longa* (500 tons), *Coix lachrymal-jobi* (178 t), *Homa-lomena ormatica* (93 t), *Polygonum multiflorum* (28 t), *Siegesbeckia orientalis* (16 t) and *Scrophularia buergeriane* (13 t) (Tran Khac Bao, 1995: 142-143). A list of 356 rare medicinal plants, as

recorded in Vietnamese Red Book, is classified into: rare (159 species), threatened (83), vulnerable (61), known indefinitely (29) and endangered (24) species (*Vietnamese Studies*, 1996: 133-158).

LEGACY OF VIETNAMESE TRADITIONAL MEDICINE

Vietnam is one of the few countries credited with remarkable achievements in traditional medicine due mostly to the rich legacy of experience in diagnosis and treatment of diseases. Vietnam's traditional medicine, based on the rich and varied materia medica, has been developed over the centuries both for preventive and curative purposes. Eminent physicians elaborated theories to the extent of traditional medicine becoming an integral part of national life especially in rural and mountainous areas. Tue Tinh, a famous bonze and physician of 17th century, who strongly advocated the need for "treating the Vietnamese people with Vietnamese medicines", wrote the *Medical Treatise of Hong Nghia* and the *Miraculous Drugs of South* which enlisted 499 medicinal substances, 3873 recipes and 182 ailments. About 500-700 patients coming from many regions of the country were reported to have been treated daily at the Tue Tinh Ward in Phap Hoa Pagoda (Long Thanh district, Dong Nai Province). Notwithstanding the discrepancies over the life time of Tue Tinh % "sometime in the period from 11th to 13th century" (Dinh Gia Luy, 1990: 12) or 14th century (Hoang Bao Chau, 1984: 19) % the herbal medicines dispensed there acquired significance in the context of failure of western medicine in curing such ailments as neurasthenia, degeneration of morrow, tumours in pituitary glands and uterus (Do That Loi and Thai Thanh, 1988: 24-25). Yet another precious medical document was *General Principles of Medicine* written by the 18th century physician, Hai Thoung Lan Ong (Dinh Gia Luy, 1990: 12; Hoang Bao Chau, 1984:19); and in fact, Lan Ong street in Hanoi was named after him. The theories of this outstanding physician have been highlighted by Dr. Le Nguyen Khac in his book, *Combining Traditional and Modern Medicine* (Nguyen Tue, 1984: 19).

The definitive scientific character of Vietnamese traditional medicine is amply testified by its own theoretical basis in explaining

the phenomenon of life and diseases, disease-prevention-and-treatment methods, and preserving and restoring health methods. It relies upon three sources of disease – external (changes in nature), internal (influence of society on mental activities from which illness stems) and other causes including man's own activities (work, intercourse, fighting, intestinal worms, poisoning, bites). Traditional medicine is broadly divided into: internal medicine, external medicine (surgery), traumatology, obstetrics & gynaecology, paediatrics, medicine of senses, weather-related diseases and epidemics. It stresses the functional training of the system encompassing respiration, nerves, circulation and digestion as well as the five senses with the aim of maintaining equilibrium between *am* (matter) and *duong* (function). The *am-duong* equilibrium, as devised by primitive materialism, is considered as basic parameter of good health. Thus traditional medicine having primitive materialism as its philosophical instrument explains the external manifestations of the laws of nature.

Vietnam has more than 5000 qualified practitioners who have been trained to enrich and develop traditional methods of medical treatment with the help of both ancient documents and popular experience. The success accomplished by the traditional medicine boosted the image of system and the morale of practitioners. When the Western medicine under the French colonial rule was reserved for the colonial masters and the nobles, it was the traditional medicine that played a preponderant role in the country-side. But the traditional medicine, as is known well, is bitter to taste and require long process to produce the desired results. Further, the preparation of medicines, conforming to the prescribed formula, was found to be very difficult. Ho Chi Minh, the founder of the Indochina Communist Party and who led the struggle for independence and unification of Vietnam against the French and then the United States, also advocated "to combine the Eastern with the Western medicines". Vietnam government is also in favour of the combination of traditional and modern methods aimed at better medicare to the people. In this endeavour, Vietnamese physicians, chemists and pharmacists employed the modern techniques in the preparations of herbal medicines in the form of powders, tablets, decoction, liquids for injections and various

solutions (Hoang Bao Chau, 1984: 19; Hoang Hanh, 1976: 16-17). Worth mentioning are the efforts of Dr. Nguyen Nhu Kim who learnt the knowledge of Western medicines and coordinated the same with oriental medicine at the Hanoi Council for Oriental Medicine Diagnosis and Treatment established by Pham Xuan Thinh (*Vietnam Review*, 2003: 12-14). Dr. Le Nguyen Khac (1984: 19) has also proved the effectiveness of the combination of "clinical and traditional and modern para-clinical methods for diagnosis and discovering diseases". Similarly, accupuncture, which has long been employed as a traditional method of physiotherapy, has been in conjunction with anaesthesia successfully used in surgery. Vietnamese method of accupunctural anaesthesia has also drawn the attention of foreigners (Hoang Bao Chau, 1984: 19). The combination of Vietnamese and Chinese traditional medicines has made a locality in Hanoi to emerge as a biggest oriental medicine centre in Vietnam (*Vietnam Review*, 2003: 12-14).

PRESENT STATUS OF TRADITIONAL MEDICINE

Prof. Hoang Bao Chau, the winner of the title of meritorious physician, pointed out that the traditional medicine successfully treated acute illnesses at the grass root level and was found to have been more effective than the Western medicine in the treatment of chronic diseases (Vu Huyen, 1990: 12-13). In the context of economic renovation (*Doi Moi*), traditional medical practitioners have also sought to renovate their methods of diagnosis and treatment and improve their search for medicinal substances (Dinh Gia Luy, 1990: 12). Vietnam's Institute of Traditional Medicine, the successor to the Central Institute of Traditional Medicine, has been pursuing systematic research in traditional medicine which has become a discipline of medicine and pharmacy. Thanks to the well-organized treatment of this system, hospitals at all levels in Vietnam % national, provincial and district levels % have a department of traditional medicine. The Institute of Traditional Medicine has its relations established with the erstwhile Soviet Union; and it is one of the 28 W.H.O. Cooperation Centres on traditional medicine (25: 12-13). The Institute offers a total of 16 courses on

Vietnamese Traditional Medicine for physicians coming from the erstwhile Soviet Union, erstwhile Czechoslovakia, Cuba, Holland, India, Laos, Cambodia, Mongolia, Rumania and France. It used to receive hundreds of foreign delegations comprising doctors and researchers particularly from the erstwhile socialist countries, and send its own delegations to the erstwhile Soviet Union, Cuba, Cambodia, India, France and Japan as well as to many international and regional workshops for the purpose of exchanging the experiences on the combination of traditional and modern medicines (Dinh Gia Luy, 1990: 12; Vu Huyen, 1990:12-13).

ACHIEVEMENTS OF HERBAL MEDICINES

Some medicinal plants in Vietnam are found to have proven efficacy in curing popular diseases (like cardiovascular and cancer) generally prevalent in the developed countries and such other diseases as influenza, cough, malaria, dysentery, taenia and ascarid that are all the more pervasive in the developing countries. Furthermore, Vietnamese often exercise their choice for plant extracts in treating a wide range of common diseases such as fever, allergy, intestinal disorders (Vo Van Chuyen, 1984: 19), amoebosis, infections of digestive tract (Le Quany Toan, 1989: 31), hepatitis, dengue and

rheumatism as well as diarrhoea, dysentery and broncho-pneumonia (Vu Can, 1972: 166; Vu Huyen, 1990: pp.12-13). Plant drugs are found more effective than the Western medicine in treating chronic hepatitis, kidney inflammation, duodenal ulcer, encephalitis, repeated miscarriage, cervical ulcer and infertility (Vu Huyen, 1990: 12-13). Similarly some recipes have proven efficacy in treating the cirrhosis of liver, hypertension and heart-failure as well as degeneration of morrow, tumours in pituitary glands and uterus, and neurasthenia (Do That Loi and Thai Thanh, 1988: 24-25; Van Hoa, 1988: 24). Given in the Table 1 is the list of some plant species and their medicinal value, compiled from various Vietnamese official sources, as indicated against them.

Thanks to the efforts of Vietnamese traditional medicine practitioners, 11 out of 20 kinds of herbal medicines % having proven efficacy in treating cirrhosis of the liver, hypertension and heart failure % have obtained licenses; and 38 kinds of plant drugs have been recommended by the Health Ministry. The use of 'to moc' and 'panma' made from *Caesalpinia sappan* has effectively checked the epidemic dysentery in Nam Ha province in 1971 (Hoang Hanh, 1976: 16-17; Van Hoa, 1988: 24), and so has been the clinical application of *Madhuxin* by the Burns Department of Army Hospital since 1987 in the treatment of burns and operation-wounds. Madhuxin oil, extracted from the leaves

Table 1: List of some plant species and their medicinal value

<i>Plant species</i>	<i>Family</i>	<i>Drug / extract</i>	<i>Used in the treatment of</i>
<i>Achyranthus aspera</i> ¹	Amaranthaceae	-	Arteries and anti-hypertension (as antiscleroidal agent)
<i>Caesalpinia sappan</i> ²	Caesalpinaceae	"to moc", "panma"	Epidemic dysentery
<i>Holorrhoea antidysenteria</i> ³	Apocynaceae	Olaren	Dysentery
<i>Madhuca pasquieri</i> ⁴	Sapotaceae	Madhuxin	Burns and operation Wounds
<i>Mangifera indica</i> ¹	Anacardiaceae	-	Diseases of herpes group and those caused by shigella bacteria
<i>Nelium oleander</i> ⁵	Apovynaceae	-	Cardiorascular
<i>Orthosiphon staminacus</i> ³	Laminaceae	Orthosiphe	Diuretic
<i>Saphora japonica</i> ¹	Fabaceae	-	Hypersensitive
<i>Silimum marianum</i> (exotic) ³	-	-	Cirrhosis
<i>Strophantus divaricatus</i> ⁵	-	-	Cardiovascular
<i>Thevetia neruifolia</i> ⁵	Apocynaceae	-	Cardiovascular
<i>Vinca rosea</i> ^{1,2}	Apocynaceae	-	Tumours, leukaemia heart failure

Sources: 1. Le Quang Toan (1989: 31); 2. Hoang Hanh (1976: 16); 3. Nguyen Tue (1984: 19); 4. Le The Trung (1991: 19); 5. *Vietnamese Studies* (1996: 122 (4): 127);

and seeds of *Madhuca pasquieri*, is used for soaking gauzes which successfully prevent bacterial contamination and heal the burns and wounds (Le The Trung, 1991: 19). There are herbal medicines as, for instance, those extracted from cajeput, eucalyptus and mint by a distinguished pharmacist, Tac Te, found to have efficacious remedies against influenza and common cold. Ginseng, identified with powerful anti-bacterial property, is found effective in treating laryngitis and asthma (Tran Quo Ngoc, 1988: 6). All such medicines have been well appreciated in many European countries (Hoang Hanh, 1976: 16-17).

EXPORTATION OF PLANT DRUGS

Traditional recipes prepared from, among different sources, about 100 medicinal plants have been used in health care and exported (Le Quany Toan, 1989: 31). Worth to mention is the exportation of Ginseng and young anther wine by VIMEDIMEX agency, which was awarded a gold medal at the National Fair Exhibition of Economic and Technological Achievements. Initially in 1989, about 200,000 bottles were exported to East European countries alone. The quantity of this traditional medicine was increased to 500,000 bottles in 1990, and then to 1,000,000 in 1991; and they have since then been exported to Mexico, Canada, Federal Republic of Germany and other countries. There has grown a tendency among the foreign clientele to use the Vietnamese drugs, prepared by Dr. Pham Dinh Chat, for curing rheumatism, cough and other tropical diseases; and hence they were licensed by the Ministry of Health for exportation. Similarly, Le Nguyen Khac's book, *Combining Traditional and Modern Medicine*, was awarded a first grade diploma by the USSR Health Ministry at a International Book Exhibition held in Moscow (Nguyen Tue, 1984: 19). Of much importance is the anti-radiation drug prepared from *Polygonum multiflorum* and a substance extracted from tortoise by the research team led by Prof. Nguyen Viet Phach of Army Medical Institute. Eighteen people, who became the victims of radiation by Chernobyl incident, were treated at Hanoi, in appreciation of which a certificate of merit and silver medal were awarded to the research team which produced an amount of medicine enough for treating 100 people affected by radiation. The

same research team is also reported to have invented a drug made from vegetable substance that would ensure safety from cosmic radiation for astronauts (*Vietnam Courier*, 1992: 15).

PERFUNCTORY SYSTEM NEEDS TO BE SYSTEMATIZED

Traditional medicine, as noted earlier, explains the external manifestations of the laws of nature, but failed to get insight into the very nature of life and diseases (Hoang Bao Chau, 1984: 19). Yet another lacuna of Vietnam's traditional medicine is the lack of seriousness in following the scientific norms. The usage of vernacular names for plant species deprives the scientific community of the very fundamental knowledge about identification of many plant species having medicinal importance. Further, Vietnamese "do not have any means for preserving genes *in situ* or *ex situ* or through other methods available". Their "ecological and genetic knowledge relating to the medicinal plants are not yet sufficient," although the Institute of Medical Materials has been involved in coordinating and carrying out the project for "the preservation of genetic resources and species of medicinal plants." In fact, "the preservation of genetic resources of medicinal plants is new for Vietnam;" and hence their "knowledge of many medicinal plants is still inadequate," to quote Tran Khac Bao (1995: 146-147), Secretary General of the Programme for Preservation of Genetic Resources of Medicinal Plants, who further admitted that Vietnam was in need of "vast and well organized scientific cooperation, investment (funds, material basis) and qualified personnel (training). "Vietnam which is in dire need of scientific cooperation enlisted the Indian cooperation in training Vietnamese scientists, among various other fields, in medicinal plants through an agreement signed with India as early as July 1979 (Roy and Chakraborti, 1992: 38). Though India's assistance to Vietnam was limited, India was the only country outside the socialist bloc extending all such possible economic, scientific and technical assistance to Vietnam during the period of crisis particularly when Vietnam was suffering from international isolation. India of late in 1999 extended its cooperation to Vietnam in several areas including solvent extraction from plants (*Vietnam Information Bulletin*, 1999: 6-8); and Vietnam

has viewed such a spirit of continuity of friendly relations as having immense help in developing the field of medicinal plants.

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