

Medicine for the billions

Primary health care often relies on medicinal plants

by Max Kasparek

For thousands of years humanity has known and exploited the curative and therapeutic effects of many plant species and they have been used to manufacture medicines. Despite enormous progress in synthetic chemistry and biotechnology, pharmacy is still prevailingly based on plant substances. Although homeopathy and similar practices have enjoyed a certain renaissance in western countries, the use of plant raw materials in medicine has receded in recent decades. Nevertheless, plant remedies are still the basis for the primary health care of most people of this world.

The medical sciences tap thousands of plant species which have a healing effect on the human body, and many are regularly used to prevent or cure diseases. According to the World Health Organisation (WHO), 80 per cent of the world's population rely on traditional medicine. In China alone, plant-based medicines are the backbone of primary health care for a billion people.

World-wide, at least 35,000 plant species are used for medicinal purposes - and not just those whose effect on the human body has been proven scientifically, but also those which are known to have a generally positive effect, i.e. are regularly used to treat diseases, but whose effects have not yet been scientifically investigated or proven.

Medicinal plants are used for the industrial scale manufacture of medicines and for herbal treatments. Several of the relatively few species used in industrial manufacturing are cultivated as field crops, because this is the only way to ensure a steady supply and maintain continuous quality standards. Cultivated medicinal plants have been selected and bred to

contain a higher content of biologically active ingredients than their wild forms. Herbal treatments, however, frequently use different species from wild collections. Herbal treatments are typical, e.g. for the Indian Ayurvedic medicine and Traditional Chinese Medicine (TCM).

Global trade in medicinal plants

According to UNCTAD statistics from the beginning of the 90ies, world trade in plant-based drugs valued more than US\$ 800 million per year. China is the world's largest exporter. More than 120,000 tons of plant-based drugs are traded each year, a figure four-fold that of India and ten-fold that of Germany, the countries second and third on the list. Other leading export countries are Singapore, Egypt, Chile and the USA. Hong Kong is the greatest importer of plant-based drugs (77,000 tons per year), followed by Japan and Germany. The USA, Korea, France and Pakistan also import large quantities. Developing economies are therefore not just suppliers of raw materials, just as industrialised countries are not the main consumers. Indeed, industrialised nations such as Germany, USA and Singapore are major exporters.

Both a threat and a safeguard

Collecting wild medicinal plants bears the danger of over-exploiting this bio-resource - species may recede or even disappear. Realising that collecting wild species was a threat to medicinal plants, the Chiang Mai Declaration, drawn up by the WWF, the IUCN and the WHO, was adopted in 1989. The Declaration's motto is "Health for all by the year 2000". It underlines the immense importance of medicinal plants and denounces their often ruthless exploitation. The Chiang Mai Declaration calls for international co-operation to protect medicinal plants and thus ensure health care for future

Medicinal Plant Specialist Group

The *Species Survival Commission* (SSC) is one of the largest and most active of IUCN-*The World Conservation Union's* six volunteer commissions. The SSC network encompasses 7,000 volunteer member scientists, field researchers, government officials and conservation leaders from 169 countries.

Commission members provide leadership for conservation efforts for specific animal and plant groups, and contribute technical and scientific counsel to biodiversity conservation projects throughout the world. The SSC works primarily through its 110 Specialist Groups. The *Medicinal Plant Specialist Group* (MPSG) was established in 1994 and currently comprises approximately 50 members.

The activities of MPSG include the identification of priority taxa and regions for conservations, and the promotion of the rational and sustainable utilisations of medicinal plants. The newsletter *Medicinal Plant Conservation* is published once or twice a year, and a Bibliography on Medicinal Plants Conservation has been compiled. In 1996, a "*Directory for Medicinal Plants Conservation*", prepared by M. Kasperek, G. Gröger and U. Schippmann, has been published together with the *German Federal Agency for Nature Conservation*.

A "Medicinal Plant Significant Trade Study" was launched in 1996 together with the Federal Agency for Nature Conservation and the TRAFFIC Network in order to review the status of those medicinal plants which are in international trade and are protected under the *Convention on the International Trade in Endangered Species of Animals and Plants (CITES)*. This study is being co-ordinated by M. Kasperek.

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generations. Local users are rarely a threat to any variety, but large scale collection for export, i.e. international trade, is.

Two internationally-binding agreements are relevant to the protection of medicinal plants: The *Convention on Biological Diversity* and the *Convention on International Trade in Endangered Species of Fauna and Flora (CITES)*. The Biodiversity Convention focuses on the sustainable use of the elements of biodiversity and the establishing of economic incentives to conserve nature. For medicinal plants this means giving preference to a compatible level of collecting wild plants, rather than cropping them on a large scale. If medicinal plants are only cultivated as field crops, there is no economic incentive to retain their natural habitat.

The Convention therefore opposes the opinion widely held by traditional ecologists that rare medicinal plants should be cultivated, so that collecting wild populations will cease. Whether to promote wild collection or cultivated production has to be weighed up in each case. The Yatamansi root native to Nepali highlands is an example: It is frequently used in Ayurvedic medicine, and large quantities are exported to India. As it became impossible to cover the demand by collecting wild growing plants, it seemed justified to cultivate the crop in order to cover demand yet retain the species - and this approach is showing success.

The CITES Convention developed a monitoring system for international trade in endangered species of fauna and flora. As soon as a species listed on the annex to the Convention is imported into another member state, a certificate of origin has to be brought forward certifying that the species in question is not endangered there. International trade can also be completely prohibited if necessary.

The annexes to the CITES Convention contain more than 100 plant species used at least occasionally for medicinal purposes. A dozen of these are traded on a significant international scale, including agarwood (*Aquilaria malaccensis*) from India and other Asian countries, american ginseng (*Panax quinquefolius*)

from the USA and Canada and the Aloe (*Aloe ferox*) from Southern Africa.

Traditional knowledge

Knowledge of which medicinal plant to use when, is often passed down over many generations. Traditional healers have recourse to a wide range of different medicinal plants. Their exclusive knowledge on when to use what gives them high social esteem. Traditional medicine often mixes real remedies, as we know in Western science, with others which just have a placebo effect.

Representative ethno-botanical surveys are aiming to make traditional knowledge available beyond its original locality. Traditional healers, medicine-men and herbal women, etc. are interviewed and inventories drawn up of the medicinal plants they use. Experience now shows that only those plants that are used significantly by different groups of people do in fact contain biologically active ingredients. The potential of local knowledge and the possibility of manufacturing new medicines is often over-estimated. High-input ethno-botanical surveys over many years have not yet yielded approaches that can be used on industrial scale.

The anticipation that the benefits resulting from indigenous knowledge can be returned to the original resource carriers in a benefit-sharing process may take decades to materialise and in the final instance even be a complete failure because no monetary value can be put on the results obtained. Ethno-botanical surveys nevertheless do regularly lead to the discovery of new agents to combat widespread diseases and ailments such as diarrhoea, infections, stomach pains, malaria, etc. Apart from the fact that they are locally available, however, these discoveries are seldom more effective than active ingredients already known.

Strategies to disseminate the use of medicinal plants

Whereas biodiversity in general has a high potential for finding *new* medically active ingredi-

Non-wood News

An "Information Bulletin on Non-Wood Forest Products" is published by the Wood and Non-Wood Products Utilisation Branch (FOPW) of the Forest Products Division of the FAO in Rome. Four 80-page issues containing reports, news and announcements from all parts of the globe have been published to date, making the Bulletin one of the most comprehensive information services for the non-timber sector.

FOPW also publishes a series of monographs on the individual issues. Initial publications covered the following subjects:

- Flavours and fragrances of plant origin
- Gum naval stores: turpentine and rosin from pine resin
- Report of the International Expert Consultation on Non-Wood Forest Products
Yogyakarta, Indonesia
- Natural colorants and dyestuffs
- Edible nuts
- Gums, resins and latexes of plant origin
- Non-wood forest products for rural income and sustainable forestry

FOPW is presently drawing up a "Directory on Who's Who on NTFP" - a database focusing on information on organisations, which is to be the basis for developing a world-wide network on the production and trade with "non-woods".

FOPW can be obtained from:

NTFP Officer
Viale delle Terme di Caracalla
00100 Rome, Italy
Fax (+39) 6 / 5225-3152
e-mail: non-wood-news@fao.org.

ents, enhancing the need to protect biodiversity, this is rarely an issue of primary significance for practical development co-operation projects. Here, a more promising approach is to confirm the resources of plants with an already known medicinal effect and to investigate and promote their use potential and marketing opportunities.

High inputs and expertise are required to verify the effectiveness of medicinal plants, many of which generate a subjective healing process although the therapeutic impact cannot be objectively verified or transferred to other patients. To promote the use of medicinal plants in medicine, the effectiveness of each species and each application has to be verified and, as with any other medicine, quality and safety aspects must be examined (side effects!).

A GTZ assisted project in Indonesia (on improving the use of traditional medicinal plant preparations) developed a strategy to incorporate the wide-spread therapeutic use of medicinal plants into the country's health care-system by ensuring that specific quality criteria are adhered to (in Indonesia about 70 percent of all diseases are treated with traditional remedies).

In the scope of existing structures some 50 to 70 plant species are processed and undergo a medical-pharmaceutical evaluation each year. The costs per plant range from DM 3,000 to 5,000. Monographs were drafted for a pharmacopoeia, the basis for any pharmaceutical applications. Five varieties of medicinal plant were processed in the project, to develop a pattern for further procedure; one of these, the *Andrographis paniculata* was identified as a promising anti-malaria agent.

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Résumé

Les effets bénéfiques de certaines plantes sont connus de l'humanité depuis des millénaires. C'est pourquoi nos ancêtres les utilisaient pour la fabrication de médicaments. Cela n'a pas beaucoup changé : de nos jours, malgré tous les progrès de la chimie et de la biotechnologie, les plantes sont la base essentielle de la pharmacie. Alors que, malgré une certaine renaissance, les substances végétales sont moins employées dans la médecine dans les pays industrialisés, elles restent la base des soins de santé dans beaucoup de pays du tiers monde. La collecte sauvage des plantes médicinales constitue néanmoins un problème. Ici, ce ne sont pas les consommateurs locaux, mais le commerce international qui sont les plus dangereux.

Extracto

Los positivos efectos de algunos tipos de plantas son conocidos por la Humanidad desde hace milenios. Por ello, muchas plantas han sido empleadas desde antiguo para la fabricación de medicamentos. En este aspecto, hasta hoy no ha habido un cambio esencial. A pesar de todos los progresos en la química y en la biotecnología, las plantas siguen representando la base más importante de para la farmacia. Mientras que en los estados industrializados, a pesar de un cierto renacimiento, está retrocediendo el empleo de sustancias vegetales en la medicina, en muchos países del Tercer Mundo siguen constituyendo la base de la atención sanitaria. Surgen problemas debido a la recolección incontrolada de plantas medicinales. Los mayores peligros no se deben a los usuarios locales sino al comercio internacional.

