

AGARWOOD

Looking for a faster way to produce *gaharu* in Malaysia

Kuala Terengganu. The state Forestry Department of Malaysia is on the hunt for a local form of inoculation to boost the production and industry of *gaharu*, the resin harvested from agarwood trees (*Aquilaria malaccensis*).

Inoculation of the agarwood or *karas* tree helps accelerate the process of infection, which in turn leads to a better yield of the aromatic resin. Traditionally, harvesters slash the tree for it to become infected. It is estimated that a *karas* tree takes between ten and 15 years to produce *gaharu* but, with inoculation, it takes only between two and three years.

State Forestry Department director Nor Akhrruddin Mahmud said the current vaccines used were costly as they were imported from the United States of America and Thailand, and could only be used selectively. This has slowed the production of *gaharu*, which is mainly used in the perfume trade, although it is also used medicinally as a remedy for nervous disorders such as neurosis, obsessive behaviour and exhaustion.

Two years ago, the price ranged between RM8 000 and 10 000/kg. While the economic value of an adult tree is still being researched here, on average it can yield up to RM18 000/kg after harvesting in Thailand and Indonesia. The *New Straits Times* reported in 2007 that the state is sitting on a goldmine because, in four years time, it stands to earn more than RM500 million in revenue from a 47-ha site at the Merchang forestry station holding 40 000 seedlings.

"Despite the state's huge potential to become a hub for *gaharu* production, we are still lagging behind other countries such as Thailand and Singapore as we have overlooked its economic value. But this does not mean we cannot be part of the industry. That is why we want to come up with a local inoculation which could encourage more participants," Nor Akhrruddin told the *New Straits Times* recently. Currently, the Forestry Department is working closely with the Malaysian Nuclear Institution for a local substance, but is open to other solutions. Nor Akhrruddin said the department was hoping to come up with its own form of vaccine in the next two years.

The department was also trying to encourage people to grow agarwood. (Source: *New Straits Times*, 2 July 2009.)

**BRAZIL NUTS
(*BERTHOLLETIA
EXCELSA*)**



Bertholletia excelsa

Brazil nuts are seeds, not nuts

For the past 35 years, research led by Dr Scott A. Mori of the New York Botanical Garden has focused on the classification and ecology of species of the Brazil nut family. The Brazil nut itself is only one of what is estimated to be about 250 species of that family found in the forests of Central and South America. This number includes nearly 50 species that do not have scientific names, mostly because collectors are usually not willing to climb into tall trees to gather the specimens needed to document their existence.

The Brazil nut flower is large, roughly two inches (5 cm) in diameter and fleshy; the male part of the flower has a structure not found in any other plant family in the world. The fertile stamens are arranged in a ring that surrounds the style at the summit of the ovary. This ring has a prolongation on one side that is expanded at the apex to form a hood-like structure. At the apex of the hood are appendages that turn in towards the interior of the flower. A small amount of nectar is produced at the base of these appendages. The fleshy hood presses directly on to the summit of the ovary and the six petals form an overlapping "cup" that blocks entry to the flower to all but the coevolved pollinators.

The Brazil nut is known to be pollinated only by large bees with enough strength to lift up the hood and enter the flower. These bees are presumably rewarded for their efforts by the nectar they collect from the interior of the hood. When the bees are in the flower, pollen rubs off on to their heads and backs from

where it is transferred to the stigma of subsequent flowers visited.

For the most part, a Brazil nut tree cannot fertilize itself, so the bee pollinators are needed to carry pollen from one tree to another. This is an example of a biotic interaction in which both the bee and the tree benefit – the former is rewarded with a nectar meal and the trees end up producing seeds.

At maturity, the round, woody fruits, the size of cannon balls, fall to the ground with ten to 25 edible seeds about 1.5 inches (3.8 cm) long trapped inside. In botanical terminology, a nut is a kind of fruit so this is why the Brazil nut would have been more appropriately named the "Brazil seed".

The fruit walls are chewed open and the seeds are removed and carried away by agoutis (rodents about the size of a cat), and less frequently by squirrels. Because the seeds are trapped inside the thick, woody fruits and because the bony seed coats are difficult to open, only animals with sharp teeth or a strong bite are able to consume the seeds. The agoutis and squirrels eat some of the seeds and cache others for future consumption. Some of the cached seeds are forgotten by the animals, and it is these seeds that may germinate and grow into the next generation of trees. Once again, the animals and the trees benefit: the former get a meal and the latter have their seeds dispersed to an area where they have a better chance of growing into adult trees.

The Brazil nut is an NTFP that provides income for the Amazonians who harvest it for food. The harvesting of Brazil nuts has long been cited as a prime example of how human economic activity can provide income for people and protect the biodiversity of tropical forests at the same time. However, a study by Carlos Peres and colleagues have demonstrated that continuous harvesting of Brazil nuts over long periods results in Brazil nut groves without juvenile trees; thus, there will be no replacement by younger trees when the older trees senesce and die. We continue to learn that tropical rain forests are so complex that every time they are exploited by humans they suffer negative impacts on their ecology and diversity. (Source: Plant-Talk, 13 August 2009.)

Amazon nuts at exploitive prices

La Paz. The Plurinational State of Bolivia is the world's leading exporter of the shelled Brazil nut (*Bertholletia excelsa*), a nutritious food source that grows abundantly in the country's Amazon rain forest region. But in

this tropical paradise, many of the nut gatherers live in hellish conditions. Bolivians simply call the *Bertholletia excelsa* a *castaña* (a catch-all name for "nut"). Globally, it is known as the Brazil or *pará* nut, while in South America it has many other local and traditional names.

The Brazil nut is a food rich in selenium and other minerals, as well as proteins, carbohydrates and oils, and represents 30 percent of the Amazon forest revenues in the northern Bolivian provinces of Pando and Beni, bordering Brazil. In fact, nut gathering is the main local economic activity, following the decline of natural latex extraction from the jungle's rubber trees in the mid-1980s.

But the competitive price of Brazil nuts from Bolivia brings with it a heavy component of exploitation of poor families, including children and adolescents, warns a study by the Centre for Labour and Agrarian Development Studies (CEDLA), sponsored by the Ministry of Labour, the United Nations Children's Fund (UNICEF) and the Netherlands organization Hivos (Humanist Institute for Development Cooperation).

Families who work gathering nuts are in a situation of extreme vulnerability, according to the study. Poverty, exclusion from labour rights and "cruel" exploitation are the norm in the collection of nuts in the northern Bolivian Amazon, according to CEDLA researcher Bruno Rojas.

In the 2008 season, which lasted from November to March, nut gathering mobilized some 17 000 people in Pando, Rojas told *Tierramérica*. Nut exports in that period represented 75 percent of the region's economic movement. Data from Bolivia's foreign trade institute indicate that exports reached US\$80 million and created jobs for 30 000 people, including work in nut processing and transport.

Under the "piecemeal" mode, workers are paid US\$11–17 per 23-kg box of nuts, which takes 12 to 14 hours to gather. Not only is the work poorly paid, but workers, and often the entire family, put in much more than eight hours a day, the limit stipulated by the country's labour laws.

In last year's harvest, the nut company owners and landholders caused an artificial drop in the price of the 23-kg box, from US\$17 to just US\$3, according to María Saravia, communications secretary of the Confederation of Indigenous Peoples of Bolivia. This practice is common among landowners and wholesalers, in order to drive down wages and then avoid paying

back wages for the harvest, she said in a *Tierramérica* interview.

Some indigenous communities that have obtained formal title to their land can get better prices and deliver their products to whoever they choose, but workers and their dependants who come from other regions are subject to the whims of the wholesalers, Saravia added.

"This is an ongoing fight for a change in the lives of the nut-gathering families," said the indigenous activist. According to Rojas, "the more that is produced, the more the country's labour laws are broken".

According to the Ministry of Labour, in 2007 there were 2 600 children and 2 000 adolescents involved in nut gathering, and 450 children and 1 400 adolescents working in nut processing. In the cracking, shelling and selection of Brazil nuts, two out of three children in the area work five days a week between 2 and 7 a.m., "and the lucky ones go to school at 8 a.m., without sleeping or eating, and they fall asleep in class," said the UNICEF representative in Bolivia. (Source: *Tierramérica*, 5 October 2009.)



BUSHMEAT

New analysis sounds alarm over the scale of the bushmeat trade in Central Africa

New analytical techniques have revealed that the scale of the bushmeat trade in Central Africa may be much larger than originally thought, according to a study published on 16 October 2009 by TRAFFIC, the wildlife trade monitoring network.

The study, based on an analysis of food balance sheets provided by FAO's statistical database FAOSTAT, strongly supports the view that the current situation of bushmeat hunting in Central African rain forests is precarious. According to the analysis, bushmeat extraction rose considerably in the Congo Basin between 1990 and 2005, despite the overall decrease in forest cover in Central Africa.

Cameroon appears to be exceeding – by more than 100 percent – an estimated sustainable offtake of 150 kg of game meat per square kilometre of forest, and Gabon and the Republic of the Congo are both close to this limit. The greatest rise in bushmeat production was in the Democratic Republic of the Congo, where the yield rose from 78 000 tonnes in 1990 to 90 000 tonnes in 2005. In the Republic of the Congo, production almost doubled, from 11 000 to 20 000 tonnes per year in the same time period.

"While the FAOSTAT bushmeat data probably underestimate and should be regarded with caution, the data are the most readily available official sources of information on production of wild meat in the Congo Basin and are valuable indicators of bushmeat production and consumption trends," says Stefan Ziegler, Programme Officer with WWF Germany, and author of the report.

Wildlife is a significant and direct source of protein for more than 34 million people living in the Congo Basin and bushmeat hunting is a key component of many people's livelihoods in Central Africa.

Earlier studies have demonstrated that bushmeat extraction increases with human population growth. However, the latest study finds that bushmeat consumption also increases significantly with personal wealth. "Bushmeat consumption is higher in countries with large urban populations, and the increasing urbanization in the Congo region is likely to place even greater pressure on wild animal populations there," says Ziegler, adding that the "danger is unsustainable offtake of wild game that will lead to a collapse in wild animal populations and widespread human hunger in the region".

Unsustainable harvest levels are widely believed to be the most immediate threat to the region's forest mammals. "Local people have hunted for centuries, for food and for barter, but the last 20 years have seen the emergence of a commercial bushmeat market due to rural people being increasingly drawn into the cash economy," says Nathalie van Vliet, TRAFFIC Bushmeat Strategic Advisor. "The impacts of subsistence hunting were previously balanced by the fact that the hunting was done on a rotation basis on alternate tracts of forest areas. However, shifts in human population dynamics and socio-economic factors are leading to rising and increasingly unsustainable demands on wild animal populations."

An earlier WCS (Wildlife Conservation Society) study found that offtake by commercial hunters in southeastern Cameroon was ten times more per immigrant hunter than for local subsistence hunters.

"What is clear is that management strategies to prevent overharvesting need to be implemented and measures put in place to provide alternative sources of protein for the inhabitants of the region."

However, the study also indicated that the development of animal husbandry may not be an ideal solution to provide substitute protein for game meat. The study, *Application of food balance sheets to assess the scale of the bushmeat trade in Central Africa*, was launched at the Convention on Biological Diversity's Liaison Group on Bushmeat meeting, which took place in October 2009 in Buenos Aires, Argentina.

Further to the results of the study, TRAFFIC is encouraging countries in Central Africa to enhance enforcement efforts and establish concrete law enforcement mechanisms targeted at curbing commercial bushmeat poaching. "Central African countries can cooperate in addressing this growing problem through the development of a regional enforcement plan and creating the political will to combat commercial bushmeat poaching in regional fora such as the upcoming Yaoundé +10 Summit," says Germain Ngandjui, TRAFFIC's representative in Central Africa. [*Contributed by: Roland Melisch, Global Programme Coordinator, TRAFFIC International, c/o WWF Germany, Rebstoecker Str. 55, D 60326 Frankfurt, Germany. Fax: +49 69 617221; e-mail: melisch@wwf.de; www.traffic.org*]

Gorilla virus in our midst

Researchers are shaking up the HIV family tree again. For the first time, investigators have found what looks like a gorilla version of the AIDS virus in a person. They do not know how the Cameroonian woman described below became infected but suspect that other humans harbour a similar virus. The possibility that gorillas can transmit the virus to humans further underscores the danger of butchering the apes or keeping them as pets, which still occurs in some African communities.

Several studies have shown that the most common form of the human immunodeficiency virus, dubbed HIV-1, probably evolved from a chimpanzee relative, SIVcpz. When investigators reported three years ago that they had

found a similar SIV, SIVgor, in gorillas living in Cameroon, a genetic analysis suggested that it too descended from SIVcpz. Now the finding of SIVgor in a Cameroonian woman who moved to France five years ago further complicates the story.

In a paper published online this week in *Nature Medicine*, virologist Jean-Christophe Plantier of the Université de Rouen in France and his colleagues describe how a 62-year-old woman suffering from fever and weight loss sought medical care shortly after arriving in Paris. The woman tested positive for HIV antibodies and had suffered some damage to her immune cells but had not developed AIDS. Plantier's laboratory, however, could not make copies of her virus, a standard diagnostic step in wealthier countries that quantifies how much HIV a person has in the blood. He and his collaborators eventually succeeded by using novel reagents designed to sequence unusual HIV strains. The virus they found was most closely related to SIVgor. "I was very surprised to find SIVgor in the human population," says the paper's senior author, François Simon, a virologist at Hôpital Saint-Louis in Paris. [*Source: ENN Daily Newsletter, 6 August 2009.*]

Bushmeat may cause the extinction of the saola (*Pseudoryx nghetinhensis*)

Conservation biologists based in four countries gathered for an emergency meeting in Vientiane, Lao People's Democratic Republic, from 19 to 21 August 2009, to address the peril of extinction facing one of the world's most enigmatic mammals, the saola (*Pseudoryx nghetinhensis*).

The saola inhabits remote valleys of the Annamite Mountains along the border of the Lao People's Democratic Republic and Viet Nam and was discovered only in 1992. At the time of its discovery, it was already rare and restricted to a small range. The experts attending the meeting agree that saola numbers appear to have declined sharply since then, dangerously approaching the point of extinction.

The saola resembles the desert antelopes of Arabia, but is more closely related to wild cattle. Its prominent white facial markings and long tapering horns lend it a singular beauty, and its reclusive habits in the wet forests of the Annamites give it an air of mystery. The saola has rarely been seen or photographed, and has proved difficult to keep alive in captivity.

There are none of these animals in any zoo, anywhere in the world. The wild population may number only dozens, certainly not more than a few hundred.

The saola is threatened primarily by hunting. The Vientiane meeting identified snaring and hunting with dogs (to which the saola is especially vulnerable) as the main direct threats to the species. The IUCN Red List of Threatened Species lists the saola as critically endangered, which means it faces "an extremely high risk of extinction in the wild". With none in zoos, and almost nothing known about how to maintain them in captivity, saola extinction in the wild would mean its extinction everywhere, with no possibility of recovery and reintroduction.

The participating agencies and organizations taking part in the meeting committed to take specific actions in the next 12 months to improve significantly the conservation of the species. Above all, the group emphasized that the saola cannot be saved without intensified removal of poachers' snares and the reduction of hunting with dogs in key areas of the Annamite forests.

According to William Robichaud, Coordinator of the Saola Working Group and chair of the meeting: "We are at a point in history at which we still have a small but rapidly closing window of opportunity to conserve this extraordinary animal". [*Source: Critical Ecosystem Partnership Fund.net, 4 September 2009.*]



Culinary ecotourists in Costa Rica turn wilderness foraging into dinner

Strolling through an equatorial rain forest or a northern pine forest can be thrilling enough, if only for the lavish scenery. But when you learn that you can eat a lot of what you see, a picturesque landscape takes on added intrigue. That's the fun behind a burgeoning form of responsible leisure travel called culinary ecotourism – a new breed of gastronomic vacation. The goal is to experience food not just as a diner, but as a gatherer and member of the kitchen staff.

In the sultry air beneath the Corcovado rain forest canopy in Costa Rica, tourists wander past possum wood and *ceiba* trees, hanging cacao pods and an occasional overhead arch of banana leaves the size of queen-size beds. This trek is a favourite

outing called the Edible Landscape Tour, conducted by Playa Nicuesa Rainforest Lodge in Piedras Blancas National Park, a remote, pristine corner of Central America.

As tourists enter the jungle they are guided to examples of wild rain forest produce. First is the ungainly *espavel*, a cashew tree, which produces a sweet, edible apple, the *jocote de marañon*, to which the actual cashew nut is attached. Up the trail there is *cas*, "sour guava", harvested for juices and jams, and *mimbro*, a kind of dwarf cucumber that is chopped and used in a traditional Costa Rican relish.

Some of the jungle's native foodstuffs must be left unharvested. The *palmito*, for example, is destroyed by the process of extracting its fruit, hearts of palm. Fortunately for salad lovers, there is a substitute: the domesticated *pejibay*, a tree that produces the same delicacy inside renewable stems that can be removed without damaging the entire plant.

Edible insects such as termites are also offered to tourists, an exceptional example of a protein source. (Source: *Scientific American*, 9 October 2009.)

Ecuadorian jungle lodge reveals its indigenous spa

La Selva Jungle Lodge, located in the heart of the pristine Amazon rain forest of Ecuador, has created what they call "The Indigenous Spa". Two native Quichua Indian women, who reside deep in the forest but near the remote lodge, walk for an hour through the jungle from their huts to give their spiritual version of the spa experience at the lodge. For US\$69 the participant is treated to a magical dusting away of evil spirits with special leaves brought fresh for each guest; next, a footbath and foot massage with special scented plants, also from the forest, set the mood. Trays of local fruit products are also prepared from the lodge kitchen and a fruit-based energy drink contains *noni* (*Morinda citrifolia*) and *açai* (*Euterpe oleracea*).

La Selva Jungle Lodge began this project as yet another way to find sustainable work for its rain forest-dwelling neighbours. Since women are in short supply for work outside the home, the labour pool was small. Three groups of two have now been established and the women work in tandem for the US\$69. The Lodge hopes to develop more spa options for their female neighbours to develop and is considering a line of rain forest products such as those used in the spa.

La Selva shares the wealth as broadly as it can with most profits from the spa returning to the community as donations through their foundation, "Helping Hands in the Forest".

La Selva has accommodated more than 50 000 guests from almost 40 countries and was a pioneer in ecotourism, winning many ecotourism awards. (Source: eMediaWire, 1 September 2009.)

Rafflesia: new hope for world's largest flower

Deep in the jungles of Southeast Asia blooms the world's largest flower – a massive fleshy orb designed by nature to attract insects by mimicking the colour and stench of rotting meat. The bizarre bloom, named *Rafflesia* after famed British colonialist Sir Stamford Raffles who stumbled across one in Borneo in 1818, is under threat from deforestation and harvesting for traditional medicine. But under an innovative Malaysian scheme, indigenous tribes that once gathered *Rafflesia* buds by the sackload are being trained as custodians of the rare flowers, and to act as guides for ecotourists.

"We used to pick the buds and sell them to traders. We took many, many sackfuls," said Long Kadak, a member of the Semai tribe in Ulu Geroh, a scenic village in the northern Perak state which has embraced the scheme. "But now we're not selling them because we want tourists to come and see our flowers. We make much more money that way," said Long.

Long is one of a dozen guides who take visitors to the elusive blooms, as well as to enchanting butterfly groves and waterfalls. As she guides a number of tourists behind her, she said the scheme had revived traditional skills and knowledge. "Only older people used to pick them because they knew the places where they grew. Now the young people know how to reach them," she said. "Now we know the value of the flowers we don't allow our people to gather them. We've got to take care of this place," said Long, whose tribe is one of Malaysia's indigenous people known collectively as Orang Asli.



Abdul Latiff Mohamad, a world expert on *Rafflesia* from the National University of Malaysia, said the scheme has brightened the prospects of the plant, which grows only on a specific jungle vine in parts of Indonesia, Malaysia, the Philippines and Thailand.

The total number of species is debated, but many scientists agree on 24, of which three are already extinct.

Sometimes called the "corpse flower" for its stomach-churning scent, or the "giant panda of the plant world" for its rarity, the *Rafflesia* is a parasite with no stems or leaves. It first emerges as a small lump on the vine and, over about nine months, swells into a cabbage-like bud that opens to reveal a massive five-petalled flower sometimes measuring more than 1 m across. The bloom, coloured a mottled red, pink or orange depending on the species, is visible for just a few days, before turning black and rotting away. Not all varieties of *Rafflesia* have the distinctive stench, and even among those that do, the open bud has to be caught just at the right time. Abdul Latiff confesses he has rarely caught the full whiff. The smell comes from the exuding smell to attract carrion flies. They come browsing and help in pollination.

The conservation scheme originated in Sabah state in Borneo in 1993, when an enterprising national parks official asked indigenous people to monitor the buds so he could alert hotels, which sent guests to see an open bloom.

Abdul Latiff said that as well as providing income for local people, the new ecotourism business influenced developers who previously had quietly hacked out *Rafflesia* groves to avoid any interference from environmentalists. "The *Rafflesia* population of Sabah really was saved. There was no overcollection any more and people took the initiative to locate new populations they had heard about from their grandfathers," he said.

There are several more sites across the country that are potential locations for *Rafflesia* conservation programmes, he said, including some areas where "sacks and sacks" of buds are still being harvested.

New interest in *Rafflesia* has seen more studies carried out into its range and even its DNA. But Abdul Latiff says its best hope is with the Orang Asli. "They have had an association with the jungle much longer than us. If they fail in looking after the *Rafflesia*, what chance do I have?" he said. "Without this programme, they would have faced a slow death." (Source: *The Brunei Times*, 10 November 2009.)



Shea nut and other beauty products get fairtrade makeover

Five companies recently released the first line of fairtrade-certified beauty products in the United Kingdom. Consumers can now buy lip balm, lotion, shower gel and face masks produced in a way that benefits small farmers and the environment. Each product contains at least one fairtrade certified ingredient.

"It's great news that now the beauty industry will get a fairtrade makeover and the farmers who grow the natural ingredients will get a fairer deal," said Harriet Lamb, Executive Director of the Fairtrade Foundation.

The Fairtrade label guarantees that the producer of the product on sale was paid a living wage for his or her work, that the product was made in an environmentally sustainable manner, and that it was not made using child labour or other forms of exploitation. "Most important, Fairtrade enables us to help ourselves and to support each other," said Nana Yago, a fairtrade shea nut producer from Burkina Faso, one of the poorest countries in the world.

Many disadvantaged producers of beauty product components such as cocoa butter, shea nut butter and Brazil nut oil will be able to increase their markets and invest greater resources in the well-being of their families and communities. Meanwhile, consumers will have a greater ability to vote with their wallets for goods produced in a socially and environmentally just manner. (Source: OneWorld.net, 6 July 2009.)

From honey to fragrant soap

Once flooded with a honey oversupply, local beekeepers in Thailand's northern province of Phitsanulok have come up with an innovative way to turn the amber nectar into new value-added consumer products to generate extra income.

Here in this picturesque, flower-filled countryside, the quantity of honey that can be collected amounts to as much as 4.5 tonnes every year. But as sales volumes have dropped and raising prices was not a way out, the apiarists or honey farmers of Baan Naam Ab Community Enterprise Group in the provincial seat have added value to their commodity, moving from selling only bottled honey to other goods that require more processing.

Thanks to the knowledge provided by Phitsanulok's Naresuan University, local beekeepers have been trained to make honey soap for additional income, without wasting the sometimes overabundance of pure honey from the more than 200 local beehives, painstakingly collected from the nectar of *longan* flowers, a product considered as top quality worldwide.

The apiarists have succeeded in developing natural honey soap bars with a special formula using pure honey as 30 percent of the total soap substance. To make a different product, they add bee pollen and powdered turmeric so the soap becomes a skin moisturiser as well. Liquid honey soap, using a formula of 40 percent honey, was also created with a delicate texture and a pure honey aroma. This product alone triples the value of the sweet liquid, a value-added plus.

"Pure honey can be sold to a wholesale company at around 70 baht/kg. So that means you'll be getting 70 000 baht from one tonne of honey. But if you bottle it and process it yourself, then your value-added goods, made out of one tonne of honey, will be worth around 200 000 baht. A bottle of honey can produce up to around 200 honey soap bars. A solid soap bar is sold at 25 baht to wholesalers and 35 baht to retailers," said Dao Ganget, chairperson of the Beekeepers at Baan Naam Ab Community Enterprise Group.

The honey farmers here are determined to keep developing their commodities. They believe there are still a lot of marketing channels out there for their goods as bee products, i.e. honey, royal jelly and bee pollen, have long been well known and accepted for their medicinal, nutritional and moisturizing properties.

Local residents are currently experimenting with bee pollen soap, as its main property is to help cure asthma. Despite the fact that people may consume less pure honey, when it comes to processed honey, at least those loving to pamper themselves will find these honey products simply irresistible. (Source: Thai News Agency MCOT, 26 August 2009.)

Neem: a centuries-old remedy for problem skin and hair

A tree native to Southeast Asia, neem (*Azadirachta indica*) is known as "the village pharmacy" in tropical regions where it is grown. It is a cornerstone of Ayurveda, one of the world's oldest medical systems, and has been used as a medicinal herb for nearly 5 000 years. Neem oil, leaf and bark

are used externally for skin, scalp and hair; only the leaf and bark are used as an internal supplement.

With more than 180 separate compounds, neem has multiple properties that help rejuvenate hair and scalp while protecting them from ongoing damage. With extraordinarily high levels of antioxidants – up to hundreds of times more concentrated than those found in blueberries or broccoli – neem helps protect the skin from environmental damage.

Neem oil is rich in essential fatty acids, like those found in sea buckthorn oil, which nourish and balance problem skin. The natural oils and glycerides quickly and easily penetrate the outer layers of skin to soothe even chronically dry, itchy or flaking areas with psoriasis or eczema. It has been traditionally used to even out skin tone irregularities, helping to balance and restore proper skin pigmentation for issues such as vitiligo or age spots.

Neem is an ideal herb for acne-prone skin because it can help to soothe irritation and inflammation, clear up pimples and remove undesired levels of bacteria on the skin that can cause more break-outs.

Neem leaf, bark and oil are also packed with anti-inflammatory, antifungal, antibacterial and antiviral properties. Neem leaf is rich in naturally occurring quercetin, which is well known as a compound that supports the body's ability to respond to inflammation. Neem leaf and bark are also well documented for their immune-boosting compounds that protect against noncystic acne without drying skin – a particularly important consideration for older women.

While neem is often used for problematic skin and scalp, it also has potent anti-ageing properties that help revitalize skin, restore a youthful glow to dry or rough skin, reduce fine lines and balance skin tone. Neem cream and lotion are also great for sunburn, after-snow treatments and for general skin and facial care.

Certified organic and ethically wild-crafted neem oil and neem leaf extracts are commonly likened to tea tree essential oil for their broad-spectrum actions. However, neem oil is cold-pressed and not distilled, so it is not as drying or irritating as tea tree oil can be. All forms of neem are soothing and nourishing to the skin and scalp. Neem leaf has a mild aroma and can be taken internally as a dietary supplement or applied topically. Neem bark has even more antioxidants than the leaf and oil. (Source: Health News Digest, 6 July 2009.)

Use of NTFPs in hair care in Bangladesh: an overview

The use of NTFPs in health care is as old as human existence and their role in, and contribution to, the welfare of people all over the world are crucial.

In Bangladesh, the use of plants in beauty care has been practised since times immemorial, particularly among the aboriginal communities. This use has gathered momentum over the past few decades and is now a mainstream trend.

A recent study, which included an extensive literature survey, investigated the use of NTFPs in hair care in Bangladesh, the results of which are summarized in the table.

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Use of NTFPs in hair care

NTFPs	Parts used	Method of use
Amloki (<i>Amblica officinalis</i>)	Fruit	The fruit is soaked in water and then boiled and sieved; the resulting water is used as a shampoo
Bichuti (<i>Tragia involucrata</i>)	Fruit	The fruits are ground with water to make a paste, which is then applied to the head
Black pepper (<i>Piper nigrum</i>)	Fruit	Onion juice is used first, before applying a ground mixture of black pepper and salt (NaCl) to the head
Bohera (<i>Terminalia belerica</i>)	Kernel	The ground kernel is mixed with water and the mixture is then applied to the head
Chalta (<i>Dillenia indica</i>)	Fruit	Two spoonfuls of juice of the ripe fruit are mixed with water and eaten. In the case of green fruit, it is ground and the juice used as oil on the head
Dhonia (<i>Coriandrum sativum</i>)	Leaf	The leaves are boiled and the water is then used for washing hair for four to five days
Durba (<i>Cynodon dactylon</i>)	Leaf	Durba is boiled with coconut/mustard oil and is used as oil on the head
Dutra (<i>Datura metal</i>)	Leaf	The leaves are ground well to make juice and the juice is then used on the head
Joba (<i>Hibiscus rosa-sinensis</i>)	Flower	The latex obtained from the ground flowers is applied to the head as anti-dandruff
Keshraj (<i>Eclipta prostrata</i>)	Leaf	The juice of the leaves is mixed with coconut oil and then used on the head
Kesut pata (<i>Eclipta prostrata</i>)	Leaf	The leaves are ground, mixed with <i>Wedelia calendulacea</i> juice and then applied around the head
Kolke (<i>Thevetia peruviana</i>)	Seedling	After grinding, a paste is made and applied to the head
Mehedi (<i>Lawsonia inermis</i>)	Leaf	Leaves are ground well and boiled with <i>Terminalia chebula</i> and the mixture used twice a week around the head
Thankuni (<i>Centella asiatica</i>)	Leaf	The juice obtained by grinding five to six leaves is consumed with a cup of milk and some sugar
Til (<i>Sesamu indicum</i>)	Flower	The flower is ground well with butter oil and honey and then coated around the head
Vringoraj (<i>Wedelia calendulacea</i>)	Leaf	Leaves are ground well to extract juice, which is then applied for two to four days against head lice
Vula (<i>Hibiscus tiliaceus</i>)	Leaf	The juice obtained from grinding the leaves is mixed with honey and applied over the head

HANDICRAFTS

Fibre-yielding plants and their uses in India

For millennia, fibre-yielding plants have been an integral part of human societies, ranking second only to food plants in their use. Today, over 2 000 species of such plants have been identified. These plants are used commercially to produce cotton, jute and linen. On a smaller scale, they are used in preparing brushes, mats, baskets, fishing nets, straw hats, chair seats, bags and other articles for daily use.

In the Terai region of the Pilibhit district, Uttar Pradesh, at the foothills of the Shivaliks in the Himalayas, a wide variety of fibre-yielding plants have long been used by rural peoples in traditional cottage industries. Still today, local ethnic groups use fibre or raw material derived from local plants to produce baskets, mats, ropes, bags, threads and other items for sale and personal use.

A recent study identified as many as 20 plants of 12 angiospermic families in common use by rural peoples in Pilibhit, a district dense with forest cover (nearly 22 per cent). Among these are *Bambusa*, used to prepare baskets, mats and fans; *Cannabis sativa*, used in making ropes; and *Linum usitatissimum*, used in preparing linen. (Source: "A survey of plants used in baskets, mats and cordage industry by different ethnic groups of Terai Region of Pilibhit District of Uttar Pradesh" in *MFP News*, XIX(3), 2009.)

Traditional willow weaving in the United States of America

For Mary Claw of the Chemehuevi tribe, basket weaving is not just an art form but is also preservation. "There's nobody left," Claw said, while weaving strips of willow into an intricate basket, adding that she learned the craft from her grandmother. "It's either me, or let [basket weaving] die. There's nobody else left in my family who does it."

The California Indian Basketweavers Association was formed in 1992, in part because more and more people were finding themselves in Claw's shoes, realizing they were the last people with knowledge that had been passed down for generations.

The association was formed to preserve, promote and perpetuate the basket weaving traditions of California's Indian tribes. And the association's annual

Basketweavers Gathering serves to do just that, as it showcases a host of delicately woven baskets and offers a plethora of workshops and training in the cultural art form. The event draws basket weavers from all over the state, who come to teach their craft, learn from each other and display and sell their works.

In addition to trying to promote and preserve the art form of basket weaving, the association also serves an advocacy role. It works with public agencies, museums and art and environmental organizations to promote traditional fire management, protect native plant habitats, decrease pesticide use in areas used to gather materials and increase access to both public and private lands.

The association's Basketweaver Support Program sponsors weaving classes in tribal communities to ensure that the traditions of basket weaving are not lost, and instead are passed through the generations. The painstaking process of making a basket – from gathering the materials to weaving them together – also teaches a kind of work ethic that is lost in many other aspects of society. [Source: Times-Standard, 28 June 2009.]

A challenge for craft villages in Viet Nam

For years, Viet Nam's culture and economy have been associated with craft villages and their products, which are consumed both locally and in 136 countries worldwide.

Nevertheless, few people know that the craft villages are in trouble because of raw material shortages, says Luu Duy Dan, general secretary of the Vietnam Craft Village Association.

Bat Trang pottery, Phu Vinh bamboo products and Dong Ky woodwork products have become the main trading items in the country's north because of their unique and traditional cultural features. Despite being popular villages, trade turnover is down as a result of the material supply problem.

It is believed that Viet Nam's craft villages will fall into a material supply crisis in the next ten years if local authorities fail to find solutions soon. Most of the villages lack standard materials to maintain production.

The country's bamboo area has dwindled and many enterprises import the tropical grass with its woody stems from China, the Lao People's Democratic Republic and Cambodia. "Bamboo imported from Laos's Hua Phan province is much cheaper than in

Viet Nam," says a representative of Phu Vinh village.

Rattan supplies are also low after the tropical palm trees have been exploited for export. Rattan in traditional supply regions such as Vinh Phuc, Phu Tho, Thai Nguyen, Yen Bai, Thanh Hoa and Nghe An is nearly exhausted.

Viet Nam's silk products use over 90 percent substandard silk materials, resulting in poor-quality items from Van Phuc, Nha Xa and Duy Xuyen craft villages. Meo village in Thai Binh province, the country's chief exporter of fine handmade embroidered handkerchiefs, has to import fibres from India and Bangladesh at prices that are increasing year by year.

In Viet Nam, only Du Du, Vo Lang and Dong Giao wood-carving villages take materials from human-grown forests. This is a big advantage for the villages as more and more international consumers require certificates of origin from the Forest Stewardship Council.

Most craft villages in Hanoi cannot keep their production active as nearly 80 percent of the material comes from outside sources, according to the Hanoi Department of Industry and Trade. They have to import steel, iron, silk and wool from China and wood from the Lao People's Democratic Republic. Rattan and bamboo come from Son La and Lai Chau provinces.

Some villages can produce with local materials but have to depend on certain seasonal harvests. Meanwhile, the long-term development of material supply zones is the solution for the sustainable development of craft villages.

Some localities have established trade village development plans until 2020 but have yet to define material supply zones. Since these plans are being carried out in scattered provinces, they are not developing the area as a whole and the Government has yet to issue guidelines. As a result, international organizations find it hard to support development of the material supply zones. [Source: VietNamNet Bridge, 24 June 2009.]



Sustainable utilization of lac resource for tribal development in India

Lac is a resinous secretion of a tiny insect named *Laccifer lacca*. The lac insect feeds on the sap of host plants and secretes a resinous cover for self protection. This

BAIF INITIATIVE FOR SYSTEMATIC LAC PRODUCTION

BAIF (formerly known as the Bharatiya Agro Industries Foundation) is currently implementing integrated development projects in tribal areas across India and has established a Resource Centre for Tribal Development (RCTD) to ensure strong technical support to the field programme.

The forest-fringed project areas are rich in diversity of tree species, including those that are natural hosts of the lac insect.

BAIF has identified the systematic rearing of lac as a major intervention for livelihood generation.

BAIF's strategy is to:

- identify sites of natural occurrence, as well as traditional harvesters of lac in project areas, and develop a system for its sustainable harvesting and management;
- introduce tribal farmers participating in BAIF programmes to lac rearing by organizing training, exposure visits and demonstrations;
- promote planting of host trees of lac on farmland by introducing tree-based farming;
- work towards shifting the current dependence of lac harvesting from natural trees to deliberately grown host trees on own lands to avoid conflicts over tenure; and
- facilitate comprehensive technical support to the new generation of lac farmers.





Schleicheria oliosa

resin is scraped and collected as the lac of commerce. The plants on which the lac insects occur naturally are known as host plants.

Lac is a product of good commercial value and is harvested mostly from naturally occurring trees. It is an important source of livelihood for tribal people in remote forest areas. The present system of harvesting lac from natural host trees is primitive and is not dependable. A simple technology for rearing the lac insect artificially has been developed by the Indian Institute of Natural Resins and Gums, Ranchi.

Lac has wide-ranging industrial applications in products such as wood finishing polishes, printing inks, electrical insulation, leather and footwear, pharmaceuticals, cosmetics, paper varnishes, photographic material, rubber, paint and cars.

There are many benefits associated with lac production:

- lac is a natural product that is non-toxic and fully biodegradable;
- host trees of lac insects grow mostly on non-cultivated and degraded lands, so they do not compete with crops for land;
- as lac harvesting is traditionally done by tribal people, introducing improved methods of lac insect rearing is a promising livelihood activity for them;
- processing of scraped lac also yields by-products, e.g. wax and a natural colour; and
- after scraping the lac, the residual sticks are used as fuelwood and the leaf biomass for composting.

Some of the lac host plants of importance under central Indian conditions are flame of the forest tree/*palas* (*Butea monosperma*), the *kusum* tree (*Schleicheria oliosa*) and ber (*Zizyphus mauritiana*). (Source: MITTRA-BAIF, RCTD Fact sheet 2.)

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MEDICINAL PLANTS

Medicinal plants in conservation and development

Traditional medicine, based largely on herbs, still supports the primary health care of more people worldwide than "conventional" or Western medicine. According to the World Health Organization, up to 80 percent of the population in Africa use traditional medicine for their primary health care, and natural remedies are also popular in many Western countries. The majority of plant species used in traditional or herbal medical treatments are harvested from the wild rather than cultivated. In some parts of the world, large numbers of people are involved in the collection of wild medicinal plants to sell – for example, people from an estimated 323 000 households in Nepal alone.

About 15 000 species of medicinal plants are globally threatened – the causes include loss of habitat, commercial overharvesting, invasive species and pollution. The extinction or scarcity of these plants is not only a problem for conservation – it also results in serious problems for people's health and livelihoods.

Plantlife's Plant Conservation and Livelihoods Programme was established to find ways to conserve these medicinal plants and ensure their availability for continuing use. Under the programme, Plantlife has supported local partners in China, India, Kenya, Nepal, Pakistan and Uganda to mount community-based projects on the conservation of medicinal plants. A further four projects have been organized for the exchange and evaluation of experiences. Plantlife's report,

WHAT IS A MEDICINAL PLANT?

A medicinal plant is one used by people for medicinal purposes – to build or maintain health, stave off disease, or promote recovery from illness or misfortune. No precise definition is possible, given this wide scope and because the use of plants as medicines grades into their use for other purposes, for example, for food, personal hygiene, beauty care, psychological support and spiritual practices.

Traditions of health care must have always been features of human societies and from the evidence available it seems that plants have normally been accorded lead roles in therapy. Even today, traditional medicine (based largely on herbs) supports the primary health care of more people globally than "conventional" or Western medicine.

Medicinal plants in conservation and development: case studies and lessons learnt presents a description of these projects and an analysis of lessons learned. A set of principles, actions and conditions needed to promote the success of community-based conservation of medicinal plants is provided, based on these experiences.

Because of the value of these resources for local health care or income, we believe that a focus on medicinal plants in conservation or development carries the potential to save many other types of plants and animals as well – the inhabitants of those habitats that are valued for their medicinal plants. Thus, the presence and sustainable use of medicinal plants can be the key to conserving whole habitats.

There are three main elements in our recommended approach.

- **Community groups:** members of local communities with a special interest in medicinal plants who are prepared to work within their communities to foster developmental activities related to the conservation and use of these plants. At this level, conservation means having ensured supplies of medicinal plants to provide continuing benefits for the

community in terms of health care, income or retaining cultural traditions.

- **Project teams:** composed of individuals willing to make an effort to help communities conserve their medicinal plants or create a favourable enabling environment. Project teams may consist of individuals from various types of organizations. In our case studies, they are from NGOs and research institutes, but task teams in government departments and civil society could also take this role, for example in forestry departments, faith-based groups, women's associations, indigenous people's organizations or the organic movement.

- **The enabling environment:** embracing all those forces that influence affairs at the community level, such as laws and regulations; national policies towards indigenous groups; local health care traditions and the management of natural resources; the ethical stances of industry and consumers; the orientation of research institutes; and the positions of religious establishments and political parties on the environment.

We have assumed a three-tier structure of society for the purposes of our blueprint for the successful conservation of medicinal plants – the community, the district level and the state.

Our concentration is on species that carry value at the community level. Plants vary in their value according to the community – species valued for their medicinal properties in one community may not be similarly valued in another. Therefore, additional approaches are needed to safeguard plants fully that have been recognized as medicinals. Other conservation tools such as protected areas and *ex situ* conservation have important roles to play, and should be linked with the community-based approaches described in this report to ensure their relevance to development. [Source: A.C. Hamilton, ed. 2008. *Medicinal plants in conservation and development: case studies and lessons learnt*. Salisbury, United Kingdom, Plantlife International.]

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 (Please see page 73 for more information.)



Artemisia annua

Traditional medicines could prevent some of the millions of malarial deaths in Africa

Each year, between one and three million malaria deaths occur, an estimated 90 percent of which take place in sub-Saharan Africa. Encouraging the use of traditional African herbal medicines could prevent some of these deaths, said specialists attending the 5th Multilateral Initiative on Malaria Conference in Nairobi on 6 November 2009. Over 2 000 health experts gathered to exchange views on malaria issues and discuss how to “bring knowledge to action”.

Between 1981 and 2002, 61 percent of new chemical entities brought to market derived from, or were inspired by, sources found in nature. Citing research in India, BN Prakash, researcher with the Bangalore-based Foundation for the Revitalization of Local Health Traditions, told the Conference that a five to ten times reduction in malaria-related deaths was noted among communities that use traditional medicinal plants such as *guduchi* (*Tinospora cordifolia*). Another natural product, artemisinin, the current antimalarial therapeutic mainstay, is instead isolated from the leaves of the sweet wormwood plant (*Artemisia annua*). Traditional medical practitioners have a time-honoured understanding of the medicinal properties of many natural substances. “When we carried out research involving school children in rural Tanzania about traditional Maasai medicines, we found out that 48 percent of these children already had knowledge about these plants. We used [this knowledge] to create a database for the purposes of preserving the knowledge and these plants too,” said Gemma Burford of the Global Initiative for Traditional Systems of Health. Efforts ought to be made, says Burford, to preserve this knowledge.

Exploring traditional medicine is particularly useful, given the problem of accessing malaria drugs in many remote areas of the world. Taking the traditional medicinal route exclusively, however, has its risks. Doumbo Ogobara and Mahamadou Sissoko of the Mali Malaria Research and Training Centre both called for caution, arguing many malaria-related deaths have occurred in places where traditional medicine is practised. “More research must be directed towards finding out the effectiveness of these traditional medicinal plants and their safety and efficacy because initiatives on using them could be counterproductive if this is not done. More emphasis therefore must be laid on research for plant-based prophylactics for malaria,” said Ogobara. [Source: SciDev.Net Weekly Update, 2–8 November 2009.]

Climate change endangering medicinal herbs in India

Climate change is threatening the existence of several Indian herbs that are key ingredients of the traditional Ayurvedic system of medicine, President Pratibha Patil said today, and expressed concern over the trend.

“Ayurvedic medicines make intelligent use of herbs. Climate change is disturbing the ecological balance which is making these herbs extinct. It is a big challenge for us,” she said, while inaugurating centenary celebrations of the All India Ayurvedic Congress here. She said that the herbs and plants that are becoming extinct should be properly categorized and efforts made to protect them, which would require the help of the National Medicinal Plants Boards and the Central Institute of Medicinal and Aromatic Plants.

According to Vaid Devendra Triguna, the Chairman of the Congress, herbs such as *kutki*, *atees*, *kasturi* and *praval*, which form the basis of several Ayurvedic drugs, are becoming difficult to find because of changes in climate. “We used to get good herbs from Himachal Pradesh but now it is becoming difficult. We have helped the states to constitute medicinal plant boards which are working in this area,” Triguna said. [Source: Indopia [New Delhi], 7 October 2009.]



Periwinkle: the “antineoplastic” medicinal plant

The Indian subcontinent is endowed with a rich source of medicinal plants, one of which is periwinkle (*Catharanthus roseus*) or *vinca*. This important medicinal plant is cultivated in tropical regions. Originating in Madagascar, in India it is cultivated mainly in the Tirunelveli, Theni and Madurai districts of South India.

Periwinkle is an evergreen herbaceous shrub or plant, growing to a height of 1 m. Its leaves are oval to oblong, 2–9 cm long and 1–4 cm broad; they are glossy green with a pale midrib and a short petiole 1–2 cm long, and are arranged in opposite pairs. The flowers are white to dark pink with a darker red centre. The basal tube is 2.5–3 cm long and has a corolla with a diameter of 2–5 cm with five petal-like lobes. The fruit is a pair of follicles of 2–4 cm long and 3 mm broad.

The cultivation of this crop gained momentum because of the presence of alkaloids, i.e. vincristine and vinblastine, in their leaves. These are commonly called “antineoplastic” alkaloids and are used in the treatment of various types of cancers either to slow down or to hamper the growth of cancer cells. Vincristine is mainly used for the treatment of leukemia, Hodgkin's lymphoma, non-Hodgkin's lymphoma, neuroblastoma, Wilms' tumour and other types of cancer. Vinblastine is primarily used for the treatment of testicular cancer, breast cancer, choriocarcinoma, mycosis fungoides, Kaposi's sarcoma and Letterer-Siwe disease.

There are three local types of *Catharanthus roseus* based on the colour of the flower, i.e. *alba* (white), *roseus* (pink) and *oscillate* (white flowers with a purple spot in the centre). There is not much difference in the alkaloid content of these types. The Central Institute of Medicinal and Aromatic Plants in Lucknow has released three varieties, namely *nirmal*, *dhawal* and *prabal*, all possessing a high alkaloid content.

Periwinkle can be propagated through seeds and grown in all types of soils except those that are waterlogged. It can be cultivated in areas with more than 100 cm rainfall. Periwinkle is harvested one year after sowing. The plants are harvested by cutting them 10 cm from the ground. They are then dried and separated into stems, leaves and seeds. The leaves are used for the extraction of alkaloids. [Contributed by:

M. Velmurugan, K. Rajamani, P. Hemalatha and C. Harisudan, Tamil Nadu Agricultural University, Coimbatore – 641 003, India. E-mail: hortmrvelu@yahoo.com]



Catharanthus roseus

Devil's claw (*Harpagophytum procumbens*): research work may save African plant as a natural health resource

An African plant with highly regarded medicinal properties has been threatened with extinction, but researchers around the globe are coming together to preserve its unique compounds for natural medicine.

Devil's claw (*Harpagophytum procumbens*) – which is under threat from drought in large parts of Africa – is believed to provide effective treatments for a range of conditions including arthritis and tendonitis. In fact, its extracts are in Phase II clinical trials in the United States of America for the treatment of hip and knee arthritis.

Scientists suspect that its beneficial effects stem from compounds called iridoid glycosides harpagoside and harpagide.

Dr Milen I. Georgiev says the plant currently faces significant problems with natural renewal, mainly caused by low rainfall in areas where it grows. “These problems are driving efforts to find alternative ways to produce high-value compounds from the plant, independent of geographic and climatic factors,” he stresses. Georgiev is one of the scientists spearheading the effort, and at the recently held 238th National Meeting of the American Chemical Society he presented a paper describing a new technique that may be used to develop “biofactories”, which could produce large quantities of the plant extracts at low cost. [Source: Personal Liberty Digest [United States of America], 14 October 2009.]

MUSHROOMS

Food security project offers hope of self-sufficiency

Eleven years ago Chido Govero, who never knew her father and lost her mother to AIDS, was rescued from an orphanage in Zimbabwe by a local scientist working with the ZERI (Zero Emissions Research and Initiatives) Foundation.

At the young age of 12 she began work in a university research laboratory, studying local wild mushrooms and their potential as a domesticated food source. Govero and her colleagues in the university discovered that for communities lacking a consistent supply of food, mushrooms offer superior nutrition and have the potential to contribute dramatically to food security. Govero was fascinated by the accessible and nutritious mushroom, and became an expert at making them thrive with the simple materials readily available, even to homeless orphan girls.

Now 23 years old, she is cultivating native mushrooms in mulch composed of discarded organic materials, such as fallen leaves and the husks from coffee beans, and is on a mission to teach other orphaned girls to find the mushrooms in their local environments and cultivate them for food and income. Govero has already trained a dozen other orphaned girls on how to grow mushrooms from coffee pulp. Her plan is to reach out and network throughout Africa to create jobs and alleviate hunger with what is locally available.

In July 2009, Equator Coffees, a successful American-based, woman-owned company known both for social responsibility and artisan coffees, launched Chido's Blend™ to raise funds to support Govero's work.

“Chido is an inspiration to all women entrepreneurs who work for social change,” said Helen Russell, cofounder and Chief Executive Officer of Equator Coffees. Russell recently met Govero, who travelled to the United States of America to visit leaders in the speciality coffee industry. “Chido's Blend™ will raise funds critical to the success of her efforts, and inspire coffee lovers to look deeper into the power of their morning cup. This cause takes coffee to an entirely new level.” One hundred percent of the profits from the sales of Chido's Blend™ will go towards Govero's work in coffee-growing communities. Her programme also receives vital support from the ZERI

Foundation, which specializes in international sustainable development. (Source: Sustainable Food Examiner, 5 August 2009.)

Study finds breast cancer-fighting properties of mushrooms

A recent study published in the *International Journal of Cancer* found evidence that mushrooms have breast cancer-fighting properties.

This study was conducted at the University of Western Australia in Perth and included 2 018 women. Half of the women were diagnosed with breast cancer. After adjusting for lifestyle patterns such as education, smoking, overeating and exercise levels, the researchers discovered that the women who ate at least 10 g of button mushrooms per day were 64 percent less likely to develop breast cancer. Dried mushrooms also significantly reduced the risk, but not so much as fresh mushrooms.

A substance found in mushrooms called linoleic acid may be the key to the reduced risk of breast cancer. Linoleic acid inhibits aromatase activity. Aromatase is an enzyme that helps the body to produce oestrogen. High oestrogen levels are a well-known risk for breast cancer. As many breast cancers depend on oestrogen to grow, the aromatase-inhibiting actions of mushrooms may be responsible for the reduced risk. Aromatase inhibitors are used as treatment to prevent certain types of breast cancers from recurring. Examples of these drugs are Arimidex, Femara and Aromasin.

The study also revealed that women who combined a mushroom diet with regular consumption of green tea saw even greater benefits: a reduced risk of almost 90 percent. This well-known antioxidant and anti-inflammatory agent helps prevent breast cancer by decreasing the amount of oestrogen a woman's body produces. (Like cholesterol, oestrogen has a good kind and a bad kind – and an excess of the bad can promote breast cancer.)

In addition to the theory of the benefits of linoleic acid, mushrooms have been found to strengthen the body's immune system and also possibly block tumour development. In several laboratory studies, mushroom extract has been shown actually to stop the growth of breast cancer cells. There is an ongoing study examining whether or not taking a mushroom extract twice a month can prevent the recurrence of breast cancer. Earlier studies have suggested that the traditional medicinal

mushroom, *Phellinus linteus*, hampers the growth of skin, lung and prostate cancer cells. (Source: Natural News.com, 22 September 2009.)



Viet Nam succeeds in farming medicinal mushrooms

The HCMC Center for Reishi and Medicinal Mushrooms Research has successfully grown the *thuong hoang* mushroom, which has active elements that can help treat cancers, especially in the breast, liver and stomach.

Co Duc Trong, Chair of the project to grow the mushroom in the city, said that *Phellinus linteus* has been used in traditional medicine for a long time. This mushroom is of particular interest to researchers around the world because of its tumour-prevention properties. It only grows deep in the forest and high up in mountains and can live for tens of years.

The total global output productivity of the mushroom is around 30 tonnes a year, mainly from natural sources. Only four countries have managed to farm it: the Republic of Korea, China, Japan and Thailand. With demand high, 1 kg costs VND4–10 million (US\$228–571), there are a lot of fakes.

Since 2006 the Center has successfully grown *P. linteus* in sawdust made from rubber trees instead of in tree trunks, as done by other countries. It has so far produced around 140 kg, Mr Trong said. This process protects the mushrooms from diseases and is cleaner and more uniform. It can be grown for export and for selling to drug companies, he added. (Source: SGGP, 12 August 2009.)



The use of tagua or vegetable ivory (Phytelephas macrocarpa) by Amazonian communities

In the Peruvian Amazon, palm trees play an important role for native communities and in the most recent colonizations. Some

species have many promising possibilities, e.g. the use of fruits and palm hearts; in the extraction of oils; for flour and fibre; for wood floors (mainly parquet); and in roofing leaves for rural dwellings.

Tagua, (*Phytelephas macrocarpa*), known locally as *yarina* is an Amazonian native species, not domesticated, with great potential for commercial cultivation in the Peruvian jungle. Natural exploitation in the past occasionally generated resources in the region and promoted rural employment, mainly to make vegetable buttons for the external market.

This species is present in Brazil, Colombia, Ecuador and Peru. In the Peruvian rain forest it is found in the wild in the departments of Loreto, San Martin, Amazonas, Huánuco and Junín.

Tagua is a dioecious palm, which belongs to the botanical family Araceae and reaching 12 m in height, and 3 m to the base of the leaves, in adult plants. The species grows in the wild in recent flood plains, known as *tahuampas*, which are periodically flooded. In unflooded land, the palm grows best in a soil that is rich in organic matter and with good drainage.

The food of the fruit of *yarina* is the mature endosperm, which is consumed without cooking and has a pleasant taste like coconut. In the construction of rural houses and urban settlements, the leaves are used to build roofs. The fruit is also exploited as vegetable ivory.

The massive and uncontrolled uses of these palms are causing the depletion of natural forests close to population centres and, consequently, residents must travel greater distances to obtain this resource. We need to know more about the basic aspects of the species, such as its biology and ecology.

A study was conducted in the three riverside communities of Buenos Aires, Arequipa and Yarina, located in the forests of the lower river Yanayacu Pucate, inside the Reserva Nacional Pacaya Samiria (RNPS), jurisdiction of the district of Nauta, province of Requena. The research was conducted with the support of the Fundación Peruana para la Conservación de la Naturaleza (Pro Naturaleza) and RNPS.

The objectives of this study were to evaluate the production potential of *yarina* and community involvement in the harvesting of its leaves and fruits. An inventory was also conducted for each community, with 20 x 20 m (400 m²) plots,



depending on the distance sampling. In addition, a survey was carried out to determine the ethnobotanical use of *yarina* by the local population.

The floristic composition of *yarinales* (areas dominated by *yarina* palms) was assessed by the presence of tree species such as *Hura crepitans*, *Spondias mombin*, *Duguetia tessmani*, *Eschweilera juruensis*, *Mouriri* sp., *Mouriri acutiflora*, *Chlorophora tinctoria*, *Ficus paraensis*, *Myrciaria floribunda*, *Chrysophyllum peruvianum* and *Apeiba aspera*. Only the palms of *yarinales* were evaluated: *Socratea exorrhiza* and *Attalea tessmannii*.

The density population of *yarinales* evaluated in the three communities was about 575–917 palms/ha.

The greatest abundance of leaves was found in the community of Buenos Aires, with 153 907 leaves/ha, followed by that of Arequipa with 135 720 leaves/ha and finally in Yarina with 81 840 leaves/ha.

Fruit production was also recorded, with 107 fruits in the community of Buenos Aires, 92 fruits in that of Arequipa and 17 fruits in Yarina, with an average from 0.32 to 0.43 fruits/individual and a total of from 141 to 297 fruits/ha, indicating that these *yarinales* were producing more leaves than fruits.

The harvest of the fruit is commonly carried out for the purpose of nourishing the local people (the unripe fruit is preferred), with a production of from one to five fruits per family and a harvest period from one to four months. The mature fruits are not harvested since they have no economic value within the community.

The community, both men and women, participates in the harvest of the *yarina* leaves and fruits. For the production of a *cumba* (fabric leaves used for roofing

houses), the average number of loads (50 leaves) used is from 18 to 21, but this number varies with amounts ranging from 1 250 to 2 275 leaves from 24 to 45.5 equivalent loads. The average time in which people return to harvest the leaves in the same *yarinal* ranged from two to five years. The harvest of leaves for commercial purposes has been negligible; however, in some cases a *carga* of leaves is sold within the same community. A *carga* is equivalent to 50 harvested leaves and has a selling price of about US\$1.61.

Fruit production was affected in the three *yarinales*, because of continual pressure from the harvesting of leaves, making these *yarinales* only leaf producing. A suitable method needs to be found in the future, therefore, that enables the sustainable harvest of leaves without affecting fruit production. (Contributed by: Joe Sixto Saldaña Rojas, Red Ambiental Loreтана (RAL), Av. Guardia Republicana [ex-Guayabamaba] N° 163 - a 100 metros del COA. E-mail:

redambientalloreтана@yahoo.com or jsaldanar@gmail.com; www.redambientalloreтана.org)



Sea buckthorn ties relations between India and Mongolia

India and Mongolia have joined hands to tap the potential of sea buckthorn (*Hippophae rhamnoides*), a plant better known here as *leh* berry, found in abundance in both countries.

On a three-day visit to Ladakh to see the initiatives taken by the Defence Institute of High Altitude Region (DIHAR) to make the plant economically useful for the local population, the Mongolian Ambassador to India Voroshilov Enkhbold told the Indo-Asian News Service (IANS): "We have sea buckthorn in Mongolia also, mostly in the western province. We have seen how valuable it is".

Most of the Ladakh region in Jammu and Kashmir is a cold desert, similar to the Gobi desert in Mongolia. "I want to establish some relation with India on how to tap the potential of the plant," the Ambassador said.

Enkhbold will be taking to Mongolia samples of *leh* berry juice, a herbal antioxidant supplement prepared from the

plant; a herbal tea; and some of the 200-odd products prepared by DIHAR scientists. "We are sending two of our scientists to Mongolia to share our success story in making the plant a source of income for the local population," said DIHAR Director Shashi Bala Singh.

There is plenty of sea buckthorn growing wild in Ladakh, a region in India where temperatures can plunge to as low as -50°C. Distributed over 11 500 ha in the area, the shrub can withstand the extreme temperature, including huge fluctuations in temperature, since it can also get hot under the cloudless sky.

The berries have high concentrations of vitamins A, B₂ and C, far higher than in other fruits and vegetables such as oranges, carrots and tomatoes. "The plant is a boon for the region. It fixes atmospheric nitrogen into the soil, making it more fertile; checks soil erosion; and its leaves are anticancerous, preventing tumours and improving immunity. So we call it the Golden Bush of the cold desert," Singh told IANS.

In 2001, DIHAR commercialized the beverage it prepared from the fruit under the name "Leh Berry Juice". In 2004, it made a herbal tea, the formula for which will soon be transferred to two vendors. In 2005, it came up with a jam and a sauce and, in 2009, with a herbal antioxidant supplement prepared from the plant.

"Currently we are undertaking tests for an ultraviolet protective oil and a soft gel capsule rich in seed oil and omega fatty acids to be used as a food supplement," Singh added.

The locals, who once used to consider sea buckthorn a weed, have benefited from the new findings of DIHAR and are now selling the fruit here as well as in other states.



Spondias mombin

Tsering Stobdan, a senior scientist working on the sea buckthorn research projects and a native of Ladakh, said: "So far, less than 5 percent of the plant's potential in the region has been exploited. The demand for the fruit is increasing and reflected in its price, which has increased from 8 to 30 rupees/kg in recent months". (Source: Bombay News, 30 September 2009.)

Time for Himachal (India) to explore commercial aspects of sea buckthorn

Palampur, Himachal Pradesh. Sea buckthorn (*Hippophae rhamnoides*), locally known as *charma*, has attracted the global attention of scientists, environmentalists, industrialists and various other agencies because of the presence of vitamins and many other substances in its fruits, leaves and bark. The medicinal values of this plant were discovered by Tibetan doctors in the early eighth century. However, its industrial utilization started in the former Soviet Union, when Russian scientists discovered its rich vitamin values in 1940.

With the opening of the Soviet Union in early 1980, the Chinese discovered that sea buckthorn food products and drugs helped in improving the immunities of astronauts. Later, a Chinese scientist translated a Russian book on sea buckthorn into Chinese and, consequently, active research work on various aspects of sea buckthorn began in several universities and other institutions in China. Developing its own indigenous technology as well as transferring the Russian expertise, China has now established over 300 industries based on sea buckthorn in 19 states, producing a range of health protection food products, life-saving drugs and cosmetics.

Learning from the experiences of the former Soviet Union and China, active research and plantation of sea buckthorn orchards were initiated in more than 40 countries in Europe, Asia and America with a short duration of four to five years. A number of other countries have also taken up research on this plant.

In India, the anticancer activity of sea buckthorn was discovered in early 1971 by an Indian scientist. It is unfortunate that since then there has been no follow-up, despite the fact that this plant is available in abundance in India. Sea buckthorn grows naturally along riverbanks and on slopes in the Lahual, Spiti, Chamba and

Kinnaur districts, as well as in other parts of the state. It also grows in the wild in Ladhak and the Uttar Pradesh hills.

It was only in January 1994 that India discovered the value of this medicinal plant when a Chinese scientist made a presentation on the importance and high medicinal values of sea buckthorn at the first consultation meeting organized by the State Council for Science, Technology and Environment at Shimla. Thereafter, the State Council created considerable awareness about the potential of sea buckthorn in the tribal areas of the state.

With the aim of developing and protecting sea buckthorn, the State Council set up a task force involving scientists from universities in the state. Subsequently, research on various aspects of sea buckthorn was also taken up in the Regional Research Station of HPKVV (Indian Agricultural University) at Kukamserri in Lahual and Spiti. A sea buckthorn nursery and plantation were developed by the scientists there.

It is high time that the state government and both the universities of the state encourage and give special attention to the scientists working on the research and development of sea buckthorn. There should also be studies on the economic utilization of this plant and on greening the wild deserts of tribal areas of the state. (Source: My Himachal – Sirmour [Himachal Pradesh], 22 August 2009.)



Charcoal burning threatens shea tree in Uganda

Kampala. Cultural law protects it. Village elders forbid their people from cutting it. Locals say that if the tree is cut, a drought will descend upon the land and a curse placed upon the cutter. But, today, despite all the efforts of local leaders, the much adored shea tree (*Butyrospermum parkii*) in this northern part of the country is under threat. Yet, with its natural ability to yield nuts for up to 300 years and produce oil, the shea nut tree is a godsend to the locals here.

When people lived in Internally Displaced People (IDP) camps, the bylaw protecting the shea nut tree was disregarded. Elders were dispersed, diluting their power, and rebels made searching for firewood highly dangerous. As a result, people in IDPs cut

down the trees closest to the camp, and the much honoured shea nut tree was not spared. Today, the land around camps is alarmingly dry and treeless.

Adding to this pressure, the charcoal trade is booming as peace reigns and people return to their homes. "Before the camps, people were going for agriculture, but now they need immediate money so they turn to charcoal burning and selling," says Samuel Abwola, the district forestry officer in Gulu.

In the past, charcoal burning was considered a lowly job but as harvests fail under the scorching sun, for many it has become the only source of livelihood.

"Women, men, young, old, anyone can burn charcoal. It just needs energy," says Abwola.

Hardwoods, like the shea nut tree, are especially popular because they produce heavy charcoal that burns for a long time and produces strong heat. Despite the booming charcoal trade and the desirable charcoaling qualities of the shea nut tree, some village elders are trying to implement the cultural law protecting the tree once more.

Akena John Bosco has been burning charcoal in his village of Loyoajong for the past three months. He does the charcoal burning all by himself, from cutting the tree, to heating it in the traditional kiln, to packing it in plastic sacks. He does not cut down the shea nut trees for charcoal because of the strong leadership in his village. "When you cut a shea nut tree, the local leaders demand a fine of Sh50 000 or ask you to slaughter a goat," he says, as he covers his charcoal sack with dry grass.

Shea nut oil is central to the northern way of life. Most women in Loyoajong make shea oil, which is used for cooking and moisturizing babies' skin. Mothers send their children out to collect the nuts, which they then dry, pound and cook to obtain the oil. According to a village elder, Nyeko Livingstone, 69, the oil is also used in many traditional ceremonies. "When someone dies of an illness, the surviving family members are smeared with shea," he says.



Despite the growing protection of certain species, trees are turning to charcoal. According to Abwola, local leaders should be supported in their efforts but tree protection is not enough. "We want to have people come together to replant the area where they cut trees for charcoaling," he says, adding that, without replanting, the trees will disappear, and so will the charcoal trade. (Source: AllAfrica.com, 30 August 2009.)

Shea butter empowerment and knowledge for women

While Africa is still far from having adequate capacity for scientific innovation, women are more and more present in the field of the continent's sustainable development.

According to Dr Alhadji Wareme from Burkina Faso, knowledge is not the exclusive preserve of universities and the like, but is also to be found by building on traditional techniques and craftsmanship. He says women's groups have made enormous strides in this regard in Burkina Faso, notably in the production of shea butter.

"The *filière* (producer to consumer chain) for shea butter produced by women's organizations offers major opportunities in terms of invention and wealth creation in a rural or urban setting, providing livelihoods for women in particular, and a source of foreign currency for the country due to growing export demand," he told Inter Press Service (IPS). (Improving shea butter production in Burkina Faso – and neighbouring Mali and the Niger – has been directed towards improving joint action throughout the sector, from producers through processors, distributors, exporters and consumers: the entirety is referred to in French as a *filière*.)

The foundation of these productive advances, Wareme underlines, is in traditional knowledge. According to him, Burkinabe women have long processed shea nuts for butter. With assistance from a development partner, the International Development Research Centre, these women have improved production techniques, using manure and taking better care of the health of the trees, as well as speeding up the extraction process, using a machine press.

Wareme continues: "Women's groups, combining traditional and modern techniques, have succeeded in creating

something good in the shea butter *filière*. What's needed now is a programme to share these techniques more widely". (Source: IPS, 4 August 2009.)



WILDLIFE

Forest animals threatened by habitat loss and poaching

Forests are among the most biologically rich terrestrial ecosystems. However, deforestation, forest degradation and poaching mean that habitats are lost and the survival of many forest species is increasingly threatened.

The World Wide Fund for Nature (WWF) has identified more than 200 ecoregions as outstanding examples of the diversity of the world's ecosystems; of these, forest regions make up two-thirds of the total. Yet, while forests contain more than 80 percent of the world's terrestrial species, the survival of many of them is threatened.

The Convention on Biological Diversity (CBD) estimates that the accelerating rate of deforestation that has taken place over the last century has contributed to reducing the number of forest species by more than 30 percent. The rate of species loss in forest regions is considerably faster than in other ecosystems. Between now and 2050, it is projected that there will be a further 38 percent loss of forest species.

The conversion of forests for agricultural use and plantations, fires, pollution, climate change and invasive species all impact forest biodiversity. Fragmentation of forests as a result of roads, agriculture and the development of human settlements also impact wildlife by reducing the

corridors used to move or migrate. In Indonesia, over the period 2001–2007, forest clearance, including illegal logging, was found to be taking place in 37 out of 41 national parks, threatening many species and driving the orang-utan towards extinction. The decline of the orang-utan and the destruction of its habitat have reached such a level that wildlife conservationists have set up so-called "orang-utan refugee camps" in certain areas.

Animals living in the forest are also at risk from poaching and bushmeat hunting. In Africa, the bushmeat consumption per capita is higher in logging and mining areas, as the workers are often able to afford bushmeat. Networks of logging roads and tracks also provide hunters with easier access to abundant wildlife areas. As a result, commercial and subsistence hunting can quickly reach unsustainable levels, leading to local extinction of the targeted wildlife species. In Central Africa, species in danger not only include the larger mammals, such as elephants, rhinoceroses, great apes and other primates, but also porcupines, cane rats, pangolins, monitor lizards and guinea fowl. Bushmeat hunting and trading have now become big business and are one of the main threats to many of the major species in Africa.

As mentioned, a species under threat from poaching is the rhinoceros. Rhinoceros horn is used in traditional Asian medicine, believed to reduce fevers and even prevent loss of life. Other parts of the rhinoceros, including the skin and bones, are also used for their supposed medicinal qualities. Demand for rhinoceros horn has increased substantially in recent years. Of the five species of rhinoceros, three are listed in the IUCN Red List as critically endangered. Poaching is not the only way by which rhinoceros horn finds its way to the market. In certain instances and limited to specific populations, trade in the horns derived from the hunting of rhinoceros is allowed under CITES. However, recent investigations have shown that hunters are abusing regulations and taking the horns into commercial trade, involving organized crime, corruption, abuse of diplomatic privileges and money laundering.

Intelligence gathering, regular monitoring and strict enforcement are effective ways of curtailing both illegal logging and poaching activities in forests.



The participation of local communities in these activities can facilitate implementation of laws and regulations and secure sustainability. Customs enforcement also plays a critical role in controlling trade in various species. [Source: Vital Forest Graphics. 2009. UNEP, GRID-Arendal.]

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Orang-utans use leaves to make “music” to mislead predators

A new study shows that wild orang-utans in Borneo hold leaves to their mouths to make their voices sound deeper than they actually are, making them, apart from humans, the only animals known to use tools to manipulate sound.

The orang-utan’s music, if you can call it that, is actually an alarm call known as a “kiss squeak”. “When you’re walking in the forest and you meet an orang-utan that is not used to humans, it’ll start giving kiss squeaks and breaking branches,” says Madeleine Hardus, a primatologist at the University of Utrecht in the Netherlands, who has spent years documenting the practice among wild apes in Indonesian Borneo.

She contends that orang-utans use leaves to make these kiss squeaks to deceive predators (such as leopards, snakes and tigers) as to their actual size – a deeper call indicating a larger animal. [Source: The Times of India, 6 August 2009.]

Gorilla dung critical to containing climate change?

A leading United Kingdom wildlife expert said today that protecting the large primates he called the “gardeners of the forest” could provide the easy fix for global warming envisaged by international reforestation programmes.

The United States of America and other industrialized countries are looking to reforestation programmes in Africa, Southeast Asia and South America to help contain the effects of climate change. But Ian Redmond, the UN ambassador for the Year of the Gorilla, said the industrialized countries would be making a mistake if they did not commit specific funds to

protecting the gorillas as part of the discussion on reforestation efforts at the climate change negotiations in Copenhagen next December.

“If we save the trees and not the animals, then we will just see a slow death of the forests,” Redmond said. “What I am urging the decision-makers at Copenhagen to consider is that the gorillas are not a luxury item. If you want a long-term healthy forest you have to take action to protect them.”

The gorillas were crucial to fighting climate change, he said. Gorillas, which are herbivores, feed on fruit and plants. The digested food, as it passes through their systems, helps seeds to germinate.

The full extent of the gorillas’ role in propagation is unclear. But Redmond said a number of plant species could not flourish without them, or wild elephants, the other large mammal crucial in germination.

The gorillas – caught up in the region’s civil wars, preyed on by poachers and crowded out of their homes by mining and logging industries – are already endangered across Africa. But Redmond’s argument could help give the animals a new level of protection.

The world’s forests act as a natural trap for carbon emissions, sucking up some 4.8 billion tonnes of carbon a year. Economists such as Lord Stern have said that spending about US\$15 billion a year on reforestation programmes would be the cheapest way of cutting greenhouse gas emissions. In the run-up to the meeting on climate change in December, there has been a growing focus on reforestation programmes in Africa, Southeast Asia and South America.

However, there has been no direct recognition of the role played by large animals – such as gorillas – in propagating plants on the jungle floor.

Redmond said gorillas were crucial to maintaining the lifecycle of the rain forests in the Congo Basin. The forests themselves suck up more than 1 billion tonnes of carbon every year. “This is what the species are for. They are not ornaments. They are not just interesting things to study. They are part of an ecosystem,” he said.

All of the big apes are now considered endangered. Nearly 20 years of civil war in the Great Lakes region of Africa have seen an explosion in illegal mining and logging by militias seeking money for guns.

Two gorillas are killed in the Democratic Republic of the Congo each week and their corpses sold as bushmeat, an investigation by Endangered Species International found. Many gorillas live outside the relatively small protected enclaves of national parks. These gorillas are losing their habitat because of rapid urbanization. Villagers are venturing deeper into the forest to cut down trees for cooking charcoal. [Source: Guardian.co.uk, 13 October 2009.] ♣



Patience is power; with time and patience the mulberry leaf becomes a silk gown.

Chinese proverb