

Headline	Herbal hub		
MediaTitle	The Star		
Date	05 Dec 2011	Color	Full Color
Section	StarTwo	Circulation	304,904
Page No	1to3	Readership	1,026,812
Language	English	ArticleSize	2018 cm²
Journalist	SHARMILLA GANESAN	AdValue	RM 75,518
Frequency	Daily	PR Value	RM 226,553



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Herbal hub

The herbal industry is a multi-billion-ringgit business and no effort is being spared in taking our local herbal products to a new level. >2

Forest Research Institute Malaysia (FRIM) general worker R. Selvakumar tending to *hempedu bumi* (*Andrographis paniculata*) plants. — Azman Ghani/The Star

Growing our

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herbal industry

A concerted effort is under way to add value to local herbal produce through clinical trials and scientific data.

By SHARMILLA GANESAN
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HISTORICALLY, Malaysians have been no strangers to the potential of herbal plants. Our lush rainforests are reported to be home to over 2,000 plants with medicinal value, and in most kampung around the country, the older generation still use myriad brews, poultices and pastes derived from herbal plants, for everything from physical ailments to beauty concerns.

Yet, local herbal products have thus far been seen largely as a cottage industry, lacking the proper scientific data and regulations to elevate it to a profitable business. Most of us are familiar with stalls at markets selling herbal "cures" for every condition, from *tongkat ali* teas to aloe vera creams, yet few of us would give these products much credibility.

Our local herbal industry has, however, been making progress quietly, and as a market that is growing globally at the rate of about 30% a year, it is well worth a second look. The World Health Organisation estimates four billion people use some form of herbal medicine, and the European market alone is currently worth about RM25bil.

It is with this potential in mind that Malaysia's herbal industry has been identified as one of the agriculture Entry Point Projects (EPPs) under the National Key Economic Areas (NKEAs) in the Economic Transformation Programme (ETP). Its target: a gross income of RM3.25bil by 2020.

The initiative brings together researchers, academics and the private sector to elevate our herbal products, in terms of output, quality

and credibility. This means producing not just high-quality herbal nutraceuticals, but also botanical drugs that can make credible therapeutic claims, in order to penetrate global export markets.

Assoc Prof Dr Hawa ZE Jaafar of the Department of Crop Science under the Faculty of Agriculture at Universiti Putra Malaysia, who was part of the team engaged to conceptualise the EPP, lauds the Government's move to focus on the local herbal industry.

"We've been talking about it since the 1990s, but nothing happened until last year, so I salute the realisation that the herbal market can be a big part of our Gross National Income (GNI). The global herbal market is in the trillions of ringgit!" she says.

R&D

She points out, however, that the local industry is still lacking in proper research and development (R&D).

"The main problem is, we have too many players with none of them being the champ. Research funding is all over the place, and there isn't enough scientifically-backed data. Worst of all, our herbs are currently in products (such as herbal teas and coffees) that are perceived as being of lower market value," she explains.

To develop the industry, five clusters have been set up under the EPP to analyse the value chain from crop to market: Discovery, Agronomy and Crop Production, Clinical and Pre-Clinical, Standardisation, and Formulation of Products.

Assoc Prof Hawa, together with the Forest Research Institute of Malaysia's (FRIM) natural products division director Dr Rasadah Mat Ali, are co-heads of the Discovery cluster.

As part of R&D efforts, there is a big push towards making new discoveries.

"For example, the *kacip fatimah* plant has long been known for its use by females. But there are possibilities for it in relation to osteoporosis, breast cancer and so on, as these are all conditions related to female hormones. The *tongkat ali*, too, is well-known as an aphrodisiac, but could have benefits as a male wellness drug," says Assoc Prof Hawa.

Based on this aim, the Discovery

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team has identified a list of five herbal plants to focus on, as well as an additional five that have been noted as having potential. Besides being native to Malaysia, all these herbs have a long history of use in local traditional medicine.

The five plants are: *kacip fatimah*, *tongkat ali*, *misai kucing*, *hempedu bumi* and *dukung anak*. The additional list of five includes ginger, *mengkudu*, roselle, *pegaga* and *mas cotek*.

Dr Rasadah is very happy with this approach, as it allows the team to address the gaps in the research on each plant.

FRIM has been researching medicinal plants since 1995 and provides advice, R&D and quality manufacturing facilities to stakeholders in the herbal industry. With about 250 individuals and companies seeking their expertise every year, Dr Rasadah is well aware of the importance of the EPP efforts.

"These five herbs are very popular, but lacking in R&D," she says. "Anybody can produce a supplement or drug from them, but the science is lacking. Many of the products in the market now may not be manufactured correctly, or may have side effects. *Tongkat ali* supplements, for example, should be made using the extract, not the ground-up dust of the plant. The processing too, should be free of heavy metals and contaminants. What we want to avoid is the kind of products that are processed behind someone's house and sold in a market."

Gaps

Assoc Prof Hawa adds that before embarking on R&D, their team discussed in depth the gaps in available research.

"We looked at good research documented in reputable journals. This is what is lacking in Malaysia, and what we are aiming for. From here on, all research we do must be conducted in a proper scientific manner."

The issues currently facing the herbal industry begin right at the cultivation stage. With no standardised farming practices in place, it is difficult to achieve consistency in output and quality, with supply often not being enough to cope with market demand.

"Herbs need certain controls," explains Assoc Prof Hawa. "Take *kacip fatimah*, for instance, which

has a reputation for being a very fussy and difficult plant to grow; most farmers say they don't even know what it wants. But putting more fertiliser to get a bigger plant doesn't necessarily yield higher amounts of the active ingredient. Through our research, however, we know the optimal amount of nitrogen it needs, and the right time to harvest. So we've set a protocol for growing *kacip fatimah*, and any large-scale cultivation should be familiar with it."

Dr Rasadah adds that many of the herbs tend to grow well in their natural environments, but do not receive the necessary nutrients in plantations. Based on research and cultivation done in FRIM, methods to handle these issues have also been identified.

The knowledge gained from these studies will be put into practice in crop production sites implemented under the EPP, specifically four herbal plantations that are being established in the East Coast Economic Region. The Department of Agriculture is also training small groups of farmers around the country, with the aim of creating herbal clusters.

One stumbling block in raising the quality of our herbal products is the lack of Good Laboratory Practice (GLP) labs here, a system for research laboratories to ensure the quality of pre-clinical safety tests.

"Without GLP, (herbal) products manufactured here cannot be perceived as high-ranking," Assoc Prof Hawa points out. "As the GLP governance comes from the Organisation for Economic Co-operation and Development (OECD), the findings will be accepted by all the member countries, which will then increase our export potential."

Another shortcoming, she says, is the dearth of monographs, or an encyclopaedic treatise, of each of our herbal plants, which is required by all countries before marketing of a particular product can be done.

"We've requested for dedicated funding for monographs, which we hope will remedy the situation," says Assoc Prof Hawa.

To that end, it was announced early last month that a national institute of biotechnology will be set up next year, combining the

Malaysian Pharmaceutical and Nutraceutical Institute, Malaysian Genome Institute and Malaysian

Agrobiotechnology Institute, to conduct herb-related R&D projects.

Another aspect that is crippling our industry is the loss of Intellectual Property (IP) rights over our herbal discoveries.

"A lot of work has been done in herbs, but no IPs are filed. Instead, a lot of patents are filed by Japan, Europe and the US for our materials or findings. Intellectual Property Corporation of Malaysia (MyIPO) and the Natural Resources and Environment Ministry have to be very aggressive in making sure there is a guard for our genetic resources. Anything that can be developed further must have an IP," asserts Assoc Prof Hawa.

With the EPP providing dedicated funding for R&D and clinical trials, Assoc Prof Hawa hopes that many of the challenges facing the local herbal industry today can eventually be overcome, allowing Malaysia to manufacture and export high-quality nutraceuticals and botanical drugs.

The EPP timeline sets a target of five nutraceuticals in the market by 2012, and another five by 2013. By 2016, the project aims to have developed botanical drugs.

To spearhead these efforts, the EPP is identifying anchor companies in the private sector that can be allocated funding for clinical trials, so that their herbal products can be classified as high-value products with scientifically-backed claims. Currently, three companies have been identified, with several others being assessed.

According to Assoc Prof Hawa, there are several criteria in selecting these companies.

Firstly, they must have products that are already in the market, and have a certain amount of capital. They must also have a strong marketing arm and be committed to selling their products overseas, so as to contribute to our GNI. The

anchor companies are then granted funds to run clinical trials for three of their herbal products.

Nova Laboratories, one of the anchor companies, has received funding to begin clinical trials on a herbal product derived from *dukung anak*, which claims to boost liver function and help prevent liver diseases.

Nova CEO Phang Nyie Lin says running clinical trials will pave the way for the product to be marketed

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as a botanical drug with therapeutic claims, rather than as a "herbal" or "traditional" product.

"We've spent about 10 years developing this product, but without the clinical trials, we cannot make any valid scientific claims. This is the only way that Malaysian herbal products can be marketed to the world. Putting the proper science into the product is essential," he says.

Having used their own funding thus far, Phang adds that the EPP is invaluable to companies like his.

"Clinical trials are very expensive, and can sometimes be beyond our means. With the Government's support, we are moving in the right direction."

Once the product has passed clinical trials and received its certification as a botanical drug, Phang says he plans to target other Asian countries as potential markets. Also in line to benefit from the grant is an anti-ageing product by Nova that is derived from *mas cotek*.

With the Government lending

its support to the herbal industry, the key to success, Assoc Prof Hawa stresses, now lies in the science.

"We cannot keep using our traditions to support what we sell on the counter. Once we have the scientific data, we can manufacture our products and market to countries that are now closed to us," she says.



Talking herbs: Assoc Prof Dr Hawa ZE Jaafar (right pic) of the Department of Crop Science under the Faculty of Agriculture at Universiti Putra Malaysia and FRIM's natural products division director Dr Rasadah Mat Ali are helping to develop the herbal industry.



THE herbs identified under the agriculture Entry Point Project (under the National Key Economic Areas) for the local herbal industry are ones that have held prized positions in traditional medicine for centuries.

Indigenous to Malaysia, these plants have long been known for their medicinal and therapeutic uses:

Kacip fatimah (*Labisia pumila*)
Traditionally used as a tea to increase libido in women, this herb is also claimed to regulate menstruation, treat painful periods, encourage healthy concep-

Green cures

tion, prevent vaginal infections, provide energy and resolve problems related to gas or constipation.

Tongkat ali (*Eurycoma longifolia*)
Well-known as a male virility-enhancing herb, this plant is also purported to enhance energy in general. There are also claims that it has anti-malarial and anti-bacterial properties.

Misai kucing
(*Orthosiphon stamineus*)

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Misai kucing



Dukung anak



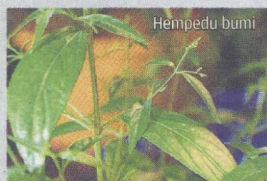
Mengkudu



Datin pegaga



Mas cotek



Hempedu bumi



Ginger root



Roselle



Tongkat ali

Popularly known as Java tea, this herb has been popularised by Indonesia as a herbal brew. It has been traditionally used to treat diabetes, kidney and urinary disorders, high blood pressure and bone or muscular pain.

Hempedu bumi (*Andropogon squarrosus*) Traditionally used to combat hypertension and diabetes, this bitter plant is also claimed to prevent various infections.

Dukung anak (*Phyllanthus niruri* Linn) This plant has long been used to boost liver health, and is also

claimed to control diabetes.

Herbs with potential

Ginger (*Zingiber officinale*) Widely used in cooking and for medicinal purposes, ginger is purported to possess many healing properties, including reducing arthritic pain, lowering cholesterol, and treating nausea, morning sickness or diarrhoea.

Mengkudu (*Morinda citrifolia*) Popularly used in cooking (the shoots are often used in *ulam*), this plant can supposedly treat menstrual cramps, bowel irregularities, diabetes, liver diseases and urinary

tract infections.

Roselle (*Hibiscus sabdariffa*) Many parts of this plant are claimed to have medicinal properties, including treating hypertension, urinary tract infections and diabetes.

Pegaga (*Centella asiatica*) Popular as an *ulam*, this herb is traditionally thought to have anti-ageing and slimming properties.

It is also purported to boost kidney health, reduce hypertension, improve blood circulation, and treat ulcers, gastric pains and diarrhoea. It is also touted as a great source of antioxidants.

Mas cotek (*Ficus deltoidea*) Traditionally used in post-partum treatment, this herb is touted to be a libido booster for men and women.

It is also used to regulate blood pressure, reduce cholesterol, reduce blood sugar and treat migraines, nausea and joint pains.

– **Sharmilla Ganesan**