

# Health benefits of commercialized herbal product in Malaysia-a review

## Abstract

Recently, Malaysian herbal industry has emerged and commercialized herbal products are widely marketed as health boosters. The benefits of the product are one of the most significant current discussions among public and scientist. It is always a contradiction among public belief and scientific data about the pharmacological effect of herbal product. Hence, various researchers were anticipated to scientifically prove the medicinal claim of different herbal product. Thus, this review provides an important opportunity to advance the understanding of research and development of the marketed herbal products.

**Keywords:** Malaysian herbal industry, herbal product, health boosters

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## Introduction

Malaysia are one of the places that having the richest biodiversity with 12% of all plant species and almost 2000 of those found locally have been reported possess medicinal qualities.<sup>1</sup> The herbal products sector in Malaysia is growing as one of the success stories under the Agriculture National Key Economic Area (NKEA).<sup>2</sup> Recently, researcher has shown an increased interest in development of commercialized herbal products. This is supported by the Government (2010) by announcing to make Malaysia as a leading country in producing high-value herbal products.

### (Product A)

Product A is using *Azadirachta indica* (*A. indica*) and *Curcuma longa* (*C. longa*) as the main ingredients in their soap bar. *A. indica* is the common name of an extremely important tree in India. In the history of development therapeutic and ethnomedicinal, *A. indica* has been thought as the sacred gift of nature.<sup>3-6</sup> In recent year, there has been an increasing interest in the studies of *A. indica* as a nature source in reducing dandruff. The effectiveness of antidandruff effect has been exemplified in a study by Mahmoud et al.,<sup>7</sup> proving that *A. indica* helps the skin remain hydrated and eliminates dandruff while strengthening the hair. Besides, *A. indica* also have been reported to improve the health of hair follicles due to its antioxidant content. In fact, it is even used in traditional medicines to stimulate hair growth and prevent male pattern baldness.<sup>7</sup>

According to Mahmoud et al.,<sup>7</sup> the antifungal and antibacterial properties of *A. indica* make it very popular in shampoos and scalp cleansers. *A. indica* effectively suppressed the mycelial growth of *Aspergillus niger*, *Aspergillus flavus*, *Aspergillus terreus* and *Aspergillus fumigatus* which are the leading factor for aspergillosis in addition to *Microsporum gypseum* and *Candida albicans*, the aetiological agent of dermatophytosis and candidiasis. Previous research by Singh et al.,<sup>8</sup> has indicated that the leaf extracts of *A. indica* were found to have

a potent antidermatophytic activity against *Trichophyton rubrum*, *T. violaceum*, *Microsporum nanum* and *Epidermophyton floccosum*.

Dua et al.,<sup>9</sup> carried out a number of investigations on *A. indica* as eco-friendly larvicide. The studies recorded that the lethal concentration (LC (50)) of the *A. indica* against *Anopheles stephensi*, *Culex quinquefasciatus* and *Aedes aegypti* was found to be 1.6, 1.8 and 1.7 ppm respectively which is effective in controlling mosquito larvae in different breeding sites under natural field conditions. *C. longa* or commonly known as turmeric is a rhizomatous herbaceous perennial plant which is native to tropical South Asia.<sup>10</sup> Phytochemical analysis of turmeric has revealed a large number of compounds, including curcumin, volatile oil, and curcuminoids, which have been found to have potent pharmacological properties.<sup>10</sup>

Recently, Paramasivam,<sup>11</sup> published a paper in which describing strong antimicrobial properties of *C. longa*. He reported that *Vibrio parahaemolyticus*, *Bacillus cereus*, *Pseudomonas aeruginosa*, and *Proteus mirabilis* was inhibited by garlic and turmeric extracts at a 5% concentration. Ethanolic extracts of *C. longa* have good antifungal activity against *Trichophyton longifusus*.<sup>12</sup> Antifungal agar disc diffusion method showed that a crude ethanolic extract of turmeric killed all 29 tested clinical strains of dermatophytes.<sup>13</sup> This extract exhibited an inhibition zone range of 6.1–26.0 mm.<sup>13</sup>

### (Product B)

Product B is specially designed supplement for women to consume which mainly contains *Pueraria candollei mirifica* (*P. mirifica*) and *Carica papaya* (*C. papaya*). *P. mirifica* is a well-known fruit in Thailand belonging to the family of leguminosae.<sup>14</sup> According to Lee et al.,<sup>15</sup> *P. mirifica* has long been used in Thailand as traditional medicine due to the presence of phytoestrogen components such as daidzin, daidzein, genistin, genistein, puerarin, miroestrol,  $\beta$ -sitosterol, stigmasterol, coumestrol, puerarin, mirificoumestan, kwakhrin and mifiricin. Over the past decade, most research *P. mirifica* has emphasized the benefit

of it in woman health. In a study conducted by Manonai et al.,<sup>16</sup> *P. mirifica* was proven to exhibit: 'estrogenicity on vaginal tissue, to alleviate vaginal dryness symptoms and dyspareunia, to improve signs of vaginal atrophy, and to restore the atrophic vaginal epithelium' in healthy postmenopausal women. The paper reported that the mean vaginal dryness symptom in the *P. mirifica* group decreased after 12 weeks of treatment. *P. mirifica* increased vaginal maturation index (parabasal: intermediate: superficial cells) from 46:43:11 to 11:65:24 after 24 weeks of treatment.<sup>16</sup>

The second main ingredient of product B is *C. papaya*, commercially known as papaya belonging to family Caricaceae. *C. papaya* grown in various parts of the world, including India, tropical America and Europe.<sup>17</sup> Zuhrotun N et al.,<sup>18</sup> points out that *C. papaya* extract have potential as anticancer through mechanism anti-proliferation and apoptosis induction. As Zuhrotun observes: 'mechanism of papaya leaf extract to inhibit the proliferation of **breast cancer** cells MCF-7 allegedly through the reduction of Reactive Oxygen Species (ROS) by antioxidant compounds contained in papaya leaf extract impact on the decrease of nuclear factor- $\kappa$ B (NF- $\kappa$ B) and impact on the **gene expression** associated with **oxidative stress** in MCF-7 cells such as COX-2, AP-1, Bcl-2 and Bcl-XL which can inhibit the proliferation of **breast cancer** cells MCF-7'.

### (Product C)

Pine bark and *Vitis vinifera* (*V. vinefera*) are the main ingredient for Product C supplement. Li et al.,<sup>19</sup> traces the first use of Pine Bark Extract (PBE) is in 1535 by French explorer Jacques Cartier and his crew. They manage to escape death by scurvy, by drinking tea made from the bark of a pine tree. In the same vein, Gulati<sup>20</sup> found that PBE to have cardio-vascular and cholesterol lowering benefits, the ability to enhance microcirculation by increasing capillary permeability, significant free radical scavenging activity against reactive oxygen and nitrogen species, the potential to regenerate the ascorbyl radical and to protect endogenous vitamin E and glutathione from oxidative stress, and the potential to protect erythrocytes in G6PD deficiency.

In a study which set out to determine the effect of PBE in cardiovascular system, Zibadi et al.,<sup>21</sup> have reported that PBE resulted in improvement of type 2 diabetes controls and reduction of the risk factor of cardiovascular disease and antihypertensive. Analysis of anti-inflammatory effect of PBE was carried out in several *in vitro* studies and revealed that PBE has anti-inflammatory effects and inhibits the initiation of inflammation by preventing the release of pro-inflammatory mediators regulated by oxidative stress. PBE inhibits the pro-inflammatory mediators in keratinocytes (epidermal cells), leukocytes, and endothelial cells.<sup>22</sup> *V. vinifera* is the scientific name for the most widely consumed fruits, which is grape vines.<sup>23</sup> Grape extracts have been reported to have a great concentration of flavonoids, linoleic acid and polyphenols with known health benefits, due to its high antioxidant capacity.<sup>24</sup>

A large and growing body of literature has investigated the antidiabetic effect of *V. vinifera*. Montagut et al.,<sup>25</sup> studied the effect of grape seed extraction on Wister female rats. The rats were treated with 25 mg grape seed procyanidin extract/kg body weight per day for 30 days and have reported that the rats had an improved homeostatic model assessment-insulin resistance index accompanied by down regulation of primers Glut4, Irs1, and Pparg2 in mesenteric white adipose tissue (WAT), concluding that the extraction has a positive long term-effect on glucose homeostasis. Natella<sup>26</sup> draws on an extensive range of

sources to access the anti-cholesterol effect of *V. vinifera*. The study investigated the effect of supplementing a single high-fat meal with 300 mg of proanthocyanidin-rich grape seed extracts in eight male adults. Natella<sup>26</sup> reported that grape seed extracts reduce postprandial oxidative stress by increasing the plasma antioxidant concentration and preventing the increase of lipid hydroperoxides.

**Table I** Summary of herbal plant used in Product A, B and C

Product	Plant	Activity	References
A	<i>Azadirachta indica</i>	Anti-dandruff Anti-fungal Anti-bacteria Anti-dermatophytic	Mahmoud et al., <sup>7</sup> Mahmoud et al., <sup>7</sup> Singh et al., <sup>8</sup> Singh et al., <sup>8</sup>
	<i>Curcuma longa</i>	Anti-microbial Anti-fungal	Paramasivam <sup>11</sup> Khattak et al., <sup>12</sup>
	<i>Pueraria candolleana</i>	Improve signs of vaginal atrophy	Manonai et al., <sup>16</sup>
	<i>Pueraria mirifica</i>		
B	<i>Carica papaya</i>	Anti-cancer	Zuhrotun N et al., <sup>18</sup>
	Pine bark	Anti-inflammatory Anti-hypertensive	Iravani <sup>22</sup> Zibadi et al., <sup>21</sup>
	<i>Vitis vinifera</i>	Anti-diabetic Anti-cholesterol	Montagut et al., <sup>25</sup> Natella <sup>26</sup>
C			

## Conclusion

It is interesting to note that, with a precise understanding of effective dose, safety and mechanism of action, herbal products have been proven to help in promoting health. The various studies make several noteworthy contributions to the health benefits of the medicinal plants. In this modern era, interest and demand from plant source commercialized product is increasing. There is abundant room for further progress on the development of herbal and nature product to be commercialized as health booster. The improvement of the herbal products quality also can be boost up as the Research and Development Institutions Agricultural R & D institutions in Malaysia have been establish to working towards practical solutions to problems rather than approaching them from purely an academic angle. The findings of the advantages in herbal products have a number of important implications for future practice. All of this information from this review can be used to develop targeted interventions in Malaysia's agricultural sector as the agriculture NKEA targets the creation of 74,000 job opportunities and to increase the income of farmers by 2 to 4 times.<sup>27</sup>

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## Conflicts of interest

The authors declare no conflict of interest.

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