Tropical plants have served as an important repository of medicinal plants for millennia. Today, many medical practitioners trained in pharmacology and/or pharmacognosy are well aware of the number of modern therapeutic agents that have been derived from the tropical species of Malaysia. For the past 50 years or so, there has been a strong trend in seeking plants as sources of novel pharmaceutical agents. Presently, both chemists and phytochemists involved in the development of natural products have come to recognize the bewildering diversity of secondary metabolites present in these plants and their potential in the pharmaceutical industry. Individual plant species often contain over 1,000 unique chemical entities (or the enzymatic machinery required to produce such compounds upon the proper stimulus). Perhaps, one of the most compelling explanations that has been put forward for this vast array of chemical diversity, that exists as a subset of biological diversity, is the chemical adaptation that such tropical plants undergo through time. In this paper, we outline the medical properties of a few representative Malaysian medicinal plants.

*Areca catechu* referred to as a common masticatory drug, is widely cultivated in India as well as South East Asia and the Pacific Islands. Powdered leaves are used to treat stomachache, whilst the leaves or roots are rolled with *Mimusops sp.* and used as cigarettes to treat ulcerated nose. A decoction of the nuts is consumed to treat cestodiacis intestinalis, diarrhea, edema, lumbago, mucositis, bronchial catarrh and urinary disorders and is also applied to treat wounds. An infusion of the bark is used as a wash to cleanse various cutaneous eruption. The skin of the nut is heated, pressed between the toes and used against itch. The essential oil of the leaves is used for the treatment of catarrhal affections, inflammation of the throat and larynx, as an antiseptic, preparation of gargle against diphtheria and as an inhalant. The significance of areca flavanol (tannin) and its relation to oral submucous fibrosis and oral carcinogenesis has been reviewed.
Andrographis paniculata is native to India, Indo-China and Southern parts of China, Malaysia and Java. A decoction of the dried plant is consumed as a tonic to alleviate hypertension, to treat tonsillitis, flu, chest pain, diarrhea, fever and as a pain killer against snake bites and harmful insects. The dried plant is boiled with Orthosiphon grandiflorus to treat diabetes. An infusion of sap from crushed leaves is applied to treat fever, prepare poultice for swollen legs or feet and female conditions. Crushed leaves are applied to treat skin eruptions. Studies on antibacterial activity carried out in A. paniculata along with five other medicinal plants of Malaysia such as Vitex negundo, Morinda citrifolia, Piper sarmentosum, and Centella asiatica revealed that, of the five plant extracts tested for antibacterial activities against gram negative E. coli and K. pneumoniae, A. paniculata and P. sarmentosum exhibited positive activity.

Aquilaria malaccensis is a valuable tree because it serves as a source for ‘gaharu’, a fragrant resinous wood that is ranked amongst the most highly valuable non-timber products. Gaharu is applied as a cosmetic and used as a treatment for illness during and after childbirth as a remedy for rheumatism, smallpox, abdominal or other body pains. An infusion of the root is administered to treat general dropsy and the leaves are rubbed over the swollen hands and legs of a dropsical patient.

Cassia alata L.’s leaves are crushed and rubbed over the affected region to treat skin diseases such as ringworm and discolouration; as well as for other parasite related skin diseases. Antimicrobial activity using an ethanolic extract of Cassia alata leaves has been investigated in Malaysia against several microorganisms including bacteria, yeast and dermatophytic and non-dermatophytic fungi. In vitro studies revealed that the extract was found to exhibit high activity against various species of dermatophytic fungi and, conversely, low activity against non-dermatophytic fungi.

Centella asiatica is a creeping herb, widely distributed throughout the tropics, and is common in Malaysia. The herb also known as “Gotu Kola” is a famous Ayurvedic medicinal and is used to treat bronchitis, asthma, gastric, catarrh, dysentery, leucorrhoea, kidney trouble, urethritis and dropsy. An infusion of the herb is consumed as a tonic as well as a cooling drink. It is also used in liver complaints and for treating the passing of blood in the urine. A decoction of the leaves is used to treat epilepsy and it has been reported to have antiepileptic properties. It is also used to treat dizziness and for internal administration for the treatment of haemorrhoids. The leaves themselves are used for poulticing sores, for the treatment of inflammatory skin conditions or applied over the whole body to treat fever, leprosy and rheumatism. The hot juice from the roots is used to clean wounds. Interestingly, the leaves are eaten raw as a salad.

Cinnamomum iners’s root is used as a decoction and is usually used as juice to treat stomach cramp. The juice of the leaves serves as a remedy against Antiaris sp. (Ipoh tree) poisoning whilst poultices prepared from pounded leaves are used to treat rheumatism. Cinnamomum zeylanicum’s boiled roots of the plant are prepared into a drink for improved blood circulation, and to increase body temperature. The bark and its essence are used as a stimulant for digestion, respiration and circulation. Documented studies exist in which rats are also fed on Cinnamomum cassia bark or extracts from Cinnamomum cassia and zeylanicum to evaluate blood glucose and plasma insulin levels under various conditions.

Sap from the crushed stem of Costus speciosus is taken to treat diarrhea, earache (Katewa et al., 2004) and eye trouble. An infusion or a decoction of the leaves is used as a soporific to treat fever. The fresh rhizome is taken with betel to treat coughs and respiratory ailments like asthma (Katewa et al., 2004). For a more effective remedy it can be used in baths, lotions or for the preparation of poultices.
Curcuma domestica tumeric locally known as kunyit is mostly used in India and various parts of Southeast Asia both as a spice, a coloring agent in cooking\textsuperscript{1} as well as for producing yellow dye.\textsuperscript{11} The rhizome serves as a carminative and anti-spasmodic in diarrhea or dysentery and as a folk remedy for other ailments such as disorders of the urinary tract, headaches, stiffness of the joints etc..\textsuperscript{11} Studies have been carried out in Malaysia on guinea pigs to determine the effects of \textit{C. domestica} on lipid composition in the serum and aorta\textsuperscript{1} which showed that inclusion of \textit{C. domestica} in the diet reduced lipid composition levels in the aorta, triglyceride levels in serum and cholesterol deposition in the aorta of high cholesterol diet animals.\textsuperscript{1}

\textit{Cymbopogon citratus}'s leaves are used to make an aromatic bath to reduce swelling, prevent body odour, to purify blood\textsuperscript{5}, as an antiseptic to treat body eruptions, cuts, wounds, anemia\textsuperscript{11} and leprosy. An infusion of the leaves is used as a treatment for digestive problems\textsuperscript{16}, as a preparation of gargles for toothache and swollen gums\textsuperscript{29}, as a tonic for post partum protective medicine and as a mild diuretic.\textsuperscript{16} The volatile oil is applied to relieve rheumatism, sprain etc. A decoction of the whole plant is used to treat coughs, colds\textsuperscript{5}, spitting of blood and in clearing the voice. The essential oil from the culms (sheaths and stems) and leaves are used as an ingredient in foods, drinks and perfumes.

\textit{Datura metel}'s leaves are smoked as a remedy for asthma and respiratory tract related diseases.\textsuperscript{26} However, in serious cases of intoxication, discontinuation is advised. The flowers and seeds are used externally to wash swollen feet, for prolapse of the rectum and to treat colds and nervous disorders. \textit{Datura metel} has also been reported to possess analgesic activity.\textsuperscript{18} A preparation of equal parts of \textit{Datura metel} and \textit{Cannabis sativa} in wine provide a narcotic anesthetic, usually used during the course of small operations and cauterizations to mitigate pain.

\textit{Elephantopus scaber} plant is used as a traditional medicine in many countries of Southeast Asia, Latin America and Africa. Methanolic extracts of \textit{E. scaber} are reported to exhibit anti-tumor activity.\textsuperscript{9} The roots of the plants are scraped, mixed in the betel quid and chewed to arrest vomiting. A decoction of the leaves is consumed to treat venereal disease in women. A decoction of the whole plant is used as a drink to treat hepatitis, bronchitis and to relieve pain in the chest.\textsuperscript{1} The pounded or boiled root is used to treat leucorrhoea and anaemia in women and children. The heated leaves are rubbed on the throat to relieve a bad cough. A decoction of the stem and leaves is drunk to treat menstrual disorders.

Powdered cloves of \textit{Eugenia aromatica} are rubbed on the abdomen after confinement and used to treat toothache. The essential oil is used as an anesthetic\textsuperscript{35}, and to treat rheumatism, the limbs of beri-beri patients and abdominal pain. The fruit is considered as an aphrodisiac as well as an appetizer. The fruit is also used to treat flatulence and colic. The flower buds are reported to have the following properties: carminative, stomachic, antimetic, antinauseant, febrifuge and vermifuge. It is also used in treating disease of the arteries, as a general stimulant and excitant of digestive functions, to cleanse foul breath and to treat diarrhea, colic, pallid complexion, swollen abdomen, vomiting after meals and cholera.

\textit{Eurycoma longifolia} locally known as Tongkat Ali is regarded as a potent aphrodisiac for men\textsuperscript{29}. Since it is reported to increase male virility, research has been carried out to investigate this property using sexually experienced male rats\textsuperscript{2}. Roots and bark are also consumed to treat diarrhea, fever, glandular swelling, bleeding gums, dropsy, persistent cough, hypertension, impotence, to relieve pain in the bones, as an aphrodisiac, antidote, febrifuge and post partum tonic. Over the years, the plant has been claimed to possess antimalarial, cytotoxic, anti-ulcer and anti-pyretic properties.\textsuperscript{10}
Helminthotachys zeylanica's root is used by the aboriginals of Nicobar Islands as drink to treat "men's complaints" fever and jaundice. A decoction of the plant is applied to treat boils, heat hives, as a febrifuge and as a stomachic for babies. The plant is used as an aperient, intoxicant, anodyne and to treat sciatica, boils, ulcers and as a treatment for malaria. The tribal people of Malappuram district in Kerala uses the rhizome to treat snake bites. Suja et al. (2002) have reported on the aphrodisiac properties of the plant as well as the hepatoprotective properties of the rhizome of Helminthotachys zeylanica (L.).

Kaempferia galanga is native to Southern China, Indochina, Malaysia and India. The leaves of this plant are crushed or pounded and used as a poultice or lotion to treat swellings and to relieve several kinds of ailments. The rhizomes of the plant, which contains essential oils, have been used in a decoction or powder for indigestion, cold, pectoral and abdominal pains, headache and toothache. The Chinese use the rhizome as an aromatic stomachic and as an ingredient in an incense preparation whilst its alcoholic maceration has been used as a liniment for rheumatism.

Mimusops elengi L. is locally known as Bunga tanjung. The leaves are pounded with Nigella seeds and applied as a hot compress or burned and smoke inhaled to alleviate the discomfort of an ulcerated nose. The bark of Mimusops elengi is known to possess cardio tonic, alexipharmic, stomachic, anthelmintic and astringent activity. Parkia speciosa (Hassk) seeds are consumed raw or cooked as a condiment in food for its flavor and texture and is believed by the locals to control diabetes. The plant has been used in folk medicine for its antibacterial activity on kidney, urethra and urinary bladder infections. The therapeutic effect has been attributed to the presence of several cyclic polysulphides.

Piper betle plant is widely cultivated in India, Sri Lanka and Burma. Juice form the leaves is swallowed to treat gonorrhea and dropped into ears to treat wounds. The shoots are used in lotions and applied to swellings, ulcers and wounds. The heated leaves are applied on the chest to relieve cough and asthma, and to the breasts to arrest the secretion of milk. The protective effect of Piper betle, a commonly used masticatory, has been examined in the brain of ethanol-administered Wistar rats. Brain of ethanol-treated rats exhibited increased levels of lipids, lipid peroxidation, and disturbances in antioxidant defense. P. betle co-administration resulted in significant reduction of lipid levels (free fatty acids, cholesterol, and phospholipids) and lipid peroxidation markers such as thiobarbituric acid reactive substances and hydroperoxides. Further, antioxidants such as reduced glutathione, vitamin C, vitamin E, superoxide dismutase, catalase, and glutathione peroxidase, were increased in P. betle-co-administered rats. The in vitro antimicrobial activity of four varieties of Piper betle (Linn) leaf stalk extracts has been studied against human pathogenic bacteria and phytopathogenic fungi and the results has been compared against standard microbial susceptibility testing biodiscs (Shitut et al., 1999). From the results, it was apparent that ethyl acetate and ethanol extracts of all the four varieties exhibited significant activity against the bacteria Vibrio cholerae ogawa, Staphylococcus aureus, Diplococcus pneumoniae and Klebsiella aerogenes (Shitut et al., 1999).

In conclusion, it is evident that Malaysian medicinal plants have the potential to deliver natural product leads for various human diseases. However, more research is required to substantiate the existing medicinal claims and to identify credible leads for the development of therapeutic agents.
Disclaimer
The authors compiled this article based on the information provided in the published literature. The authors accept no liability or no responsibility whatsoever for any loss to any person resulting from reliance upon the materials contained in this article. The contents of this article are not meant to constitute professional, health or other advice and readers should seek their own competent professional, health and other advice.

References


