

Kertas Asli/Original Articles

Malaysian Herbs in Contraception: Public Perception (Herba Malaysia dalam Kontrasepsi: Persepsi Masyarakat)

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ABSTRACT

Medicinal plants have been used in Malaysia for a long time ago. These plants have been marketed as herbal product and used in the traditional healthcare system because of its positive therapeutic effects. This paper discusses particularly several types of Malaysian herbs that are traditionally used for contraception and scientific studies related to its pharmaceutical properties showing its use among the public for its anti-fertility effects. Even though several methods of contraception have been promoted for family planning, yet, the perception of the public on the usage of synthetic steroidal contraceptives due to its serious adverse effects has made them focus on indigenous plants. Contraceptives drug-containing oestrogen and progesterone have proven to be effective and popular, However, the side effects of these drugs have sparked the idea of scientists to develop newer molecules from medicinal plants. Therefore, it is necessary to investigate in-depth qualitative research on conceptions and concerns about traditional contraceptive methods using herbal ingredients among Malaysians.

Keywords: Malaysian herbs; properties; traditional; contraception perception

ABSTRAK

Tumbuhan perubatan telah lama digunakan di Malaysia. Tumbuhan ini telah dipasarkan sebagai produk herba dan digunakan dalam sistem penjagaan kesihatan tradisional kerana kesan terapeutiknya yang positif. Makalah ini membincangkan terutamanya beberapa jenis ramuan herba Malaysia yang secara tradisional digunakan untuk kontraseptif dan kajian ilmiah yang berkaitan dengan khasiat farmaseutikal yang menunjukkan penggunaannya di kalangan masyarakat untuk kesan anti-kesuburan. Walaupun beberapa kaedah kontrasepsi telah dipromosikan untuk merancang keluarga, namun persepsi masyarakat terhadap penggunaan alat kontraseptif steroid sintetik kerana kesan buruknya telah menjadikan mereka lebih fokus pada tanaman asli. Ubat kontraseptif yang mengandungi estrogen dan progesteron terbukti berkesan dan popular, namun, kesan sampingan ubat-ubatan ini telah mencetuskan idea para saintis untuk mengembangkan molekul yang lebih baru daripada tumbuhan perubatan. Oleh itu, adalah perlu untuk menjalankan penyelidikan kualitatif dengan lebih terperinci mengenai konsepsi dan kebimbangan mengenai kaedah kontraseptif tradisional yang menggunakan ramuan herba dalam kalangan masyarakat Malaysia

Kata kunci: Herba Malaysia; khasiat; tradisional; kontrasepsi; persepsi

INTRODUCTION

In the phytogeography, Indo-Malayan, which is known as 'Melasian' zone in the terminology of biology science, has about 40,000 species of vascular plants. Malaysia is in the middle of the zone with a high number of plants (a division of spermatophyte) with 15,000 species consisting of angiosperm, gymnosperm and Pteridophyta plants. Amongst them, there are plants known scientifically for their therapeutic properties including antifertility (Ab Alim et al. 2017). Approximately two hundred and thirteen

species of plants have been used as medicine to the indigenous tribes in Peninsular Malaysia. The leaves and roots are the most commonly used parts of various types of medicinal plants by the indigenous people of the Jah Hut, Semai, Semang and Temuan tribes. (Milow et al. 2017).

Herbs are plants or parts of plants used for various uses based on their savoury, aromatic, medicinal or cosmetic properties (Peter 2012). It is also used for treatment purposes in conjunction with more than one plant. Many herbs can be used for contraceptive purposes

by preventing fertilized eggs from entering the womb, some herbs can induce uterine contractions and some even promoting sterility. While some herbs promote fertility, others may have an opposing effect (Daniyal et al. 2015). This is explained why the herbs are used for contraceptive purposes. Since 1982, the Malaysian Health and Family Planning Survey has been carried out on specific socioeconomic groups in two states in Malaysia, namely Johor and Perak. The survey had provided more information on traditional methods of contraception and assessed the use of folk methods as well as gauged the perception of its effectiveness (Ab Razak 1985). Due to a lack of an exclusive review on the perception among the public concerning contraceptive effects of Malaysian herbs, this review article is hoped to trigger further exploration of the latent potential benefits underlying the Malaysian herbs.

MALAYSIAN HERBS

Recently, much attention has been paid to the medicinal herbs used for the prevention of various diseases. This medicinal plant has been used by humans as a source of medicine since time immemorial. It has been reported that all information on the ancient use of plant material as medicine can be found in the discovery of historical and pharmacological books, archaeology and old literature (Leonti et al. 2010). In fact, about 20 and 125 plants are mentioned in the Quran and the Bible, respectively. Each of them is used as a medicinal agent to prevent and treat various diseases (Musselman 2000). However, the number of plants used could be much higher because the knowledge of the use of native plants is mostly undocumented and only verbally passed from one generation to another. Initially, the main interest of research was on phytochemical studies which led to the discovery of biologically active compounds such as chemical structures to produce new drug candidates. As the Malaysian herbal medicine market is experiencing tremendous and rapid growth, the recent research approach includes activities to develop herbal medicines into nutritious, high quality, and safe products for human use. Advances in spectroscopy and chromatography techniques have had a remarkable impact on the isolation and structural elucidation of the constituents of medicinal plants. The development of bioassay-guided isolation techniques and their use have provided great assistance to the development of medicinal plants in Malaysia (Jantan 2004).

Many researches on selected medicinal plants have been carried out by local scientists. For example, several Malaysian aromatic herbs, namely *Etlingera elatior* (Jack) R.M.Sm., *Citrus hystrix* DC., *Persicaria hydropiper* (L) H. Gross, *Murraya koenigii* Spreng., *Kaempferia galangal*

L. and *Cymbopogon citratus* Stapf. have been shown to be a potent natural antioxidant and can be used as an ingredient for functional food (Nurain et al. 2013). Apart from western Malaysia, a total of 50 plant species that are widely used by the Kadazan/Dusun community in eastern Malaysia, Sabah have been documented. Some of the plants used are such as *Psidium guajava*, *Hibiscus rosa-sinensis*, *Aloe vera*, *Curcuma longa*, *Carica papaya*, *Capsicum frutescens*, *Areca catechu* and *Annona muricata* are grown and are convenient while others such as *Vitex pubescens*, *Uvaria grandiflora*, *Polygala panniculata*, *Plantago major*, *Leucosyke capit*, *Justicia gendarussa*, *Brucea javanica* and *Alstonia Scholaris* are obtained from primary or secondary forests. Some of the plants widely used such as *Acorus calamus*, *Phyllanthus niruri*, *Centella asiatica*, *Brucea javanica*, and *Alstonia scholaris* have been studied in detail and their various active compounds have been isolated (Ahmad et al. 2003).

In a series of folk botanical surveys in a village in Terengganu, Malaysia, a total of 56 species of medicinal plants were recorded during face-to-face interviews with respondents, followed by the collection and identification of medicinal plants in the village. Most of these species are herbal angiosperms, followed by trees and shrubs. Leaves are the most common part used for the preparation of herbal medicines especially for general health, fever, stomach problems, reproductive system and to treat dermatological complaints as compared to other diseases. The most common method of preparation is poultice, followed by infusion and decoction. Therefore, more medicinal plants are used topically rather than orally (Ong et al. 2011).

This also proves that the traditional knowledge of the Malay community in the villages of Malaysia regarding medicine plants are sufficient. The use of ten medicinal plants in the traditional medicinal system of Malaysia has been reviewed by Alsarhan et al. (2014) and related scientific studies on their pharmaceutical properties demonstrated their traditional uses were elaborated. All the plants mentioned in their study was explained for its therapeutic properties and their uses in traditional medicine were also validated. The ten traditional Malaysian medicinal plants were *Amaranthus spinosus* L. (family: Amaranthaceae, local name: bayam berduri, traditional uses: gastric), *Arundina graminifolia* (D.Don) Hochr. (family: Orchidaceae, local name: ubi bemban, traditional uses: gastric), *Callicarpa arborea* Roxb. (family: Verbenaceae, local name: tambang besi, traditional uses: flatulence and gastric), *Carica papaya* L. (family: Caricaceae, local name: betik, traditional uses: gastric), *Citrus grandis* L. Osbeck (family: Rutaceae, local name: limau besar, traditional uses: gastric), *Coleus amboinicus* Lour (family: Lamiaceae, local name: hati-hati, traditional

uses: constipation), *Curcuma domestica* Valetton (family: Zingiberaceae, local name: kunyit, traditional uses: gastric and bloating), *Psidium guajava* L. (family: Myrtaceae, local name: jambu batu, traditional uses: diarrhoea and stomach ache), *Garcinia atroviridis* Griff. ex T. Anders (family: Clusiaceae, local name: asam gelugor, traditional uses: gastric) and *Zingiber officinale* Rosc (family: Zingiberaceae, local name: halia, traditional uses: gastric and flatulence) (Alsarhan et al. 2014).

Over the recent years, natural compounds derived from Malaysian medicinal plants have also received widespread attention as the main source of new therapeutic agents to treat neurological disorders and neurodegenerative diseases. The drugs prepared from plants are considered moderate in efficacy, less toxic and relatively low cost as compared to the commonly used pharmaceutical drugs (Kumaran et al. 2019). Taken together, plants to cure disease and relieve physical suffering have been used by humans since their ancient times. This is due to better cultural acceptance, better compatibility with the human body, fewer side effects and now, the effectiveness of many traditional medicines a fact now acceptable.

MALAYSIAN HERBS AS CONTRACEPTIVE


Contraception can be defined as the prevention of fertilization but is generally considered to be the use of artificial methods or other techniques to prevent pregnancy as a result of sexual intercourse (Pathak et al. 2005). Family planning has been promoted through several methods of contraception. The most common are condoms or sheaths, followed by contraceptive pills which are synthetic sex hormones that require ovulation in women, intrauterine devices such as coils that use fertilized ovums during implantation and male or female sterilization (Department of Health and Human Services 2012). The methods used are mostly women oriented. Contraceptive pills are usually female sex hormones such as oestrogen, progesterone or

their derivatives alone or together. The concept of sterilization by female sex hormones has been used for a very long time ago and it started in the early 20th century. Enovid was the first brand birth control pill marketed by the USA as a contraceptive in the 1960s (Buttar & Seward 2009).

However, nowadays there are many types of birth pills with different types of hormones, giving more options for women. Unfortunately, another study had reported that these drugs develop some unwanted effects like myocardial infarction, breast cancer, nausea and breast tenderness. So, these drugs impose a risk for the long-term use (Bagshaw 1995). Various measures have been taken to minimize the side effects of these pills but there is little success. Therefore, more attention is given to indigenous plants for contraception due to serious adverse effects produced by synthetic steroidal contraceptives. Although contraceptives containing oestrogen and progesterone are popular and effective, the risks of the drugs have triggered the need to innovate newer molecules from medicinal plants (Pradhan et al. 2013).





Herbal contraceptives have been used as an alternative for women who cannot accept modern contraceptives or who just want to try other methods. However, their long-term side effects are still unknown (Kadam & Gaykar 2018). The development of new fertility control drugs from medicinal plants is of interest to the community. Synthetic drugs are widely used in modern medicine. However, modern medicine is now being developed through indications derived from plant phytochemistry. Moreover, phytochemistry has become an important source of medicine. Recently, herbal products have become more popular than synthetic drugs. This is due to the low toxicity and long experience of exposure to this drug in ethnic medical systems such as Ayurveda (Veeresham 2012). Therefore, people all over the world are looking for suitable products from natural medicinal plants that can be used effectively instead of synthetic drugs. The Malaysian herbs attributed to antifertility effect are listed in Table 1.

Table 1. Malaysian herbs with antifertility activity

No.	Botanical name	Local name	Part used	Action	Reference	Image
1.	<i>Carica papaya</i> L.	Tepayas	Root	Birth control and for uterine contractions after childbirth	Ahmad and Holdsworth (2003)	

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2.	<i>Ocimum Sanctum</i>	Kemangi	Leaf	Decreased total sperm count, sperm motility	Ahmed et al. (2002)	
3.	<i>Centella asiatica</i> L.	Pegaga	Leaf, stem, and root	Reduction of sperm quality, degeneration of seminiferous tubule and significant decrease in serum testosterone, luteinizing hormone and follicle-stimulating hormone	Yunianto et al. (2017)	
4.	<i>Carum carvi</i>	Turmeric	Rhizome	Antioestrogenic activity	Thakur et al. (2009)	
5.	<i>Piper betel</i>	Betel pepper	Petiol	Antioestrogenic activity	Sharma et al. (2007)	

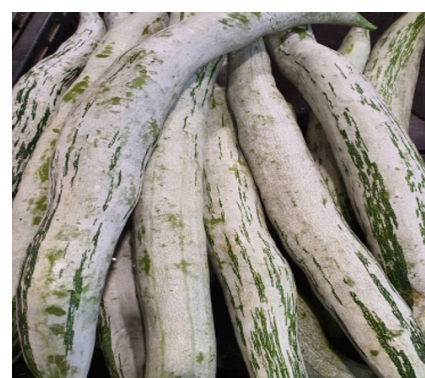
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6.	<i>Citrus limonum</i>	Lemon	Ripe fruit, root, and leaves	Antizygotic activity	Kulkarni et al. (2005)
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7.	<i>Trichosanthes cucumerina</i>	Snake gourd	Plant	Antiovolatory activity	Kage et al. (2009)
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MECHANISM OF ANTIFERTILITY ACTION FROM MEDICINAL PLANTS IN MALAYSIA

Mechanism of antifertility action extracted from medicinal plants was identified based on their biological activities such as antiovolution, antiimplantation, antispermatogenic, abortifacient and effect on hormones. Ethanolic extract of *Calotropis gigantean* which is commonly called as a crown flower or in Malay as Rembiga, exhibited antifertility effect by inhibiting implantation activity when administered to albino rats at the dose of 250 mg/kg (Kamath 2002). *Hibiscus rosa sinensis* which the active parts are believed to be its flowers, is also known as Malaysian national flower. It is used to treat hyperlipidemia, bacterial infection, depression and antispermatogenic. The plant extract exhibited strong anti-implantation and uterotropic activity with 100 % inhibition at a dose level of 400 mg/kg (Vasudeva 2008).

The benzene extract of *Ocimum sanctum* also known as 'Kemangi' decreased total sperm count, sperm motility and forward velocity in the treatment of albino rat at 250 mg/kg for 48 days (Ahmed et al. 2011). *Striga orobanchioides* also showed similar anti-implantation

activity when tested on rats. It was noted that the thickness of endometrium, epithelial cell height, increase in diameter, and increase in uterine weight was observed in rats after the administration of two flavones, luteolin and apigenin from *Striga orobanchioides* as compared to the control rats (Hiremath et al. 2000). Meanwhile, the extract of *Citrus limonum* from ripe fruit, leaves, and root are used to promote antifertility outcomes. Its active compounds include limonene, limonoid glycosides, neral, geranial, ichangin 4-beta-glucopyranoside, nomilinic acid, and 4-beta-glucopyranoside. The derivatives arising from this plant are used to treat arthritis, scurvy, and uterine haemorrhage. Its biological activity is carminative, stomachic, and anthelmintic.

The study reported the antifertility effect of lemon seeds (*Citrus limonum*) in female albino mice. The fraction of ethyl acetate alcoholic extract of lemon seeds exhibited reversible antifertility activity in female mice due to its antizygotic activity (Kulkarni et al. 2005). About 83.3% of the anti-implantation activity of *Achyranthes aspera* known as 'Ara songsang' was exhibited by the ethanol extract of leaves and seeds at a dose of 200 mg/kg body weight which exhibited 100% anti-implantation and abortifacient activity (Vasudeva & Sharma 2006). The mechanism of action of herbs is summarised in Figure 1.



Figure 1. Antifertility mechanism from medicinal herbs.

CONTRACEPTION AND PERCEPTION AMONG PUBLIC

According to World Population Day report by National Population and Family Development Board Malaysia in 2019, contraceptive rate by modern methods was 30.4%, 34.4%, and 34.3% in the statistic year of 1994, 2004 and 2014, respectively. Though, contraceptive rate by non-modern methods in the statistic year of 1994 was 24.6%, 2004 was 17.7% and 2014 was 18.0%. From the non-modern methods, the rhythm method has been the most popular method with a prevalence rate of about nine percent in 1994 and 2004. The prevalence rate for other non-modern methods including herbal preparations has declined substantially since 1984. Education and urbanization have positive effects on contraception percentage rate (CPR). However, CPR difference between rural and urban women, and across educational categories are much less pronounced than between the ethnic differentials. The same survey shows that more than half of non-users of contraception in Peninsular Malaysia in the 1994 reported of not using a contraceptive method as a reason of wanting to have children, but this had declined to 39.3 percent in the 2004 survey. The reason of “fear of side effects” has been a significant increase in the proportion of users who are not using contraceptives, and this had become the second most important reason in 2004. Nevertheless, this report has not

mentioned herbal preparation as an alternative to the proportion of users not using modern methods (World Population Day 2019).

Women who have problems with or lack access to modern contraceptive options, especially who live in rural areas in developing countries with very high populations such as India, China, Africa (Nigeria) and Bangladesh use herbs as an alternative to contraception. The study on the potential and toxicity of local plants known as birth control in folk medicine in these countries can lead to a greater confidence and acceptance of herbal contraceptives. (Pradhan et al. 2013). In the Malay community, traditional methods of contraception have been reported and explored since 1981. Based on the interview, the respondents consume papaya, pineapple and starfruit which are believed to be “sharp”, acidic and “corrosive”. They believed in the concept that these raw fruits would make the uterus wall thin and weaken, thus inducing an anti-fertility effect (Loh 1981). In 1990, a comparative study on the use of contraceptive methods and their acceptance in a rural population in Kelantan was done. In this study, 350 women attending health clinics in rubber, palm-oil estates and living in surrounding suburbs were recruited. Contraceptive methods they used were pills (55%), traditional methods (19%), tubal ligation (18%), safe period (14%), injections (5.5%), intrauterine device (4.7%), and condom (2.3%). The Malaysian traditional methods mentioned in this context are herbal preparations from roots or tree bark,

herbal pills, and exercises after sexual intercourse (Kamalanathan 1990). Further study was carried out in 1996 on the knowledge and attitude towards contraception among health care staff in the Kelantan state, Malaysia.

It was revealed that 80 to 90% practiced contraception, with most midwives preferring pills and most staff nurses preferring condoms.

About 30 to 40% of all groups felt that folk methods are effective (Suhaimi et al. 1996). Wong (2012) found that the misconception on contraceptive pills can be a harmful and become a barrier to the women to use oral contraceptives. In addition, there are some who do not intend to use condoms, but they rely on unconventional modes, such as withdrawal and rhythm methods, or traditional folk methods. Many of them, including those who are sexually active have high levels of perceived effectiveness on traditional and folk methods of contraception. Malay participants illustrated the use of more types of traditional folk methods of contraception as compared to the Chinese and Indian. It is still unclear if it is a cultural norm to maintain silence regarding sexual practices and the religious beliefs result in the heavy reliance on traditional folk methods of contraception. Another study by Nor Asyura in 2017 was carried out on the knowledge and perception on contraception practice (Ngah 2017). However, this study was specifically conducted among women with diabetes showing that there was a high prevalence of no contraception usage among diabetic women at reproductive age. Majority of respondents had poor knowledge of contraception. Despite having poor knowledge, the majority of respondents had a satisfactory perception of contraception. The non-usage of contraception was more likely associated with Malay ethnicity and older age (Ngah 2017).

In Lagos, Nigeria, the use of herbal birth control measured by Lagosians is popular because the herbs contain less or no side effect, cost-effective, easily accessible and effective. Social and economic statuses of people have no barrier to patronage (Kadiri 2009).

In Malaysia, the use of contraceptive is generally accepted by the public whether modern or traditional methods. Most of them prefer modern methods. However, some of them still prefer the traditional method due to some perceptions. Based on the result of the interview carried out among women in public university Malaysia, being anxious about infertility, cancer, and tumours were examples of misconceptions about using contraceptive methods.

The anxiety came from their own and their colleague's experiences. In fact, misconceptions about contraception and fertility were reported in all interviewees. The women feel that contraceptives interfered with their fertility, and they are scared to use something that could harm their

ability to reproduce. Friends and peer group also influenced the decision making of family planning. Respondents reflected that the decision making on using traditional herbs was based on their friend's suggestion which was their first choice for obtaining information regarding contraceptive methods (Najafi-Sharjabad 2011).

CONCLUSION

This review studied the public perceptions on the Malaysian herbs intended for contraception which was then scientifically explored by the perusal of literature. The prevailing misconceptions, including fear of using modern contraception, need an increase in research on herbs related to antifertility. Blind beliefs that traditional methods from herbal preparation do not give side effects mainly because herbal preparations are cheaper and can be readily obtained, render them preferable to be used as a contraceptive. However, there is an indication that regular counselling services program can help them to use contraceptive methods accurately and consistently. Male participation should be encouraged to participate in family planning activities. Dissemination of reproductive health information among women will help them realize the potential of modern contraceptive effects as compared to methods of traditional contraceptive in preventing unwanted pregnancies and unsafe abortions. There is an urgent need to educate women on the effectiveness of contraceptive methods with an emphasis on the comparison of benefits, availability, mechanisms of action of both modern and traditional contraceptive methods and possible side effects.

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