

THE MEDICAL USE OF GERMINATING PARTS OF PLANTS; MATA KUNYIT, SUNTI HALIA AND LEMUKUT IN MALAY MEDICAL MANUSCRIPTS

Intan Shahhira Binti Noorain, Bsc¹ and Mardhiah Mohammad, PhD^{1*}

Department of Biomedical Science, Kulliyah Of Allied Health Sciences, International Islamic University Malaysia, Jln Sultan Ahmad Shah Bandar Indera Mahkota 25200 Kuantan, Pahang, Malaysia

Corresponding Author's email: mmoh@iium.edu.my

ABSTRACT

Introduction: Germinating parts of plants are the beginning of the growth of a plant that can be seed, spore, or bud and it is usually used in the Malay community as a spice and traditional medicine. Correspondingly, this study reviews the utilisation of germinating parts of three materia medica locally known as 'mata kunyit' (*Curcuma longa* – Zingiberaceae), 'sunti halia' (*Zingiber officinale* – Zingiberaceae) and 'lemukut' (*Oryza sativa* – Poaceae) that are commonly used in the disease cure formulation recipes to treat certain diseases by traditional Malay practitioners. Their medical importance has been emphasized in certain manuscripts and has proven its potential as an enhancer in disease cures. Therefore, this study intended to outline germinating parts of the materia medica and the type of disease cures with their medicinal properties. **Methods:** Their medical use of these germinating parts was searched in six different published transliterated Malay medical manuscripts namely MSS2999 Kitab Tib, Sari Segala Ubat, Al-Rahmah Fi Al-Tibb Wa Al-Hikmah, Tayyib Al-Ihsan Fi Tibb Al-Insan, Khazinat Al-Insan, and Rumah Ubat di Pulau Penyengat. **Results:** Collectively, *mata kunyit*, *lemukut*, and *sunti halia* were mentioned 13, 10 and 3 times respectively in these six manuscripts. The review found that *mata kunyit* and *lemukut* are repeatedly used in combination to treat diseases such as dysmenorrhoea, parturition, orthostatic hypotension, cough of bronchial asthma, backache, constipation, lethargy, leprosy, ulcers and oedema. Whereas *sunti halia* and *mata kunyit* was used interchangeably as the adding factors in formulations to treat diseases such as dysmenorrhoea and cough. **Conclusions:** This finding summarises the type of diseases that often utilises *mata kunyit*, *sunti halia* and *lemukut* in the 'disease cure formulation recipes. Besides, this review deduced that future exploratory study concerning this germinating tip is highly beneficial.

KEYWORDS: *Curcuma longa*, germinating tip, Malay medical manuscript, *Oryza sativa*, *Zingiber officinale*

INTRODUCTION

The existence of manuscripts in the Malay Archipelago is a symbol of the Malay intellectual tradition and identity in the previous centuries. The Malay Archipelago possesses many Malay manuscripts, and according to Mat Piah (2015), there are about 22000 copies of Malay manuscripts to an extent of 5000 titles wherein approximately 100 texts are on the medical field (cited in Mamat, 2017). According to University of Malaya Library (2016), collectively, about 1000 manuscripts with various sizes and length with an estimation over 100 000 pages of manuscripts reside in Malaysia's repositories. The repositories outside the country that held Malay manuscripts includes Indonesia, Brunei, libraries in Leiden, University College London, Cambridge University, Bodleian Library in Oxford, the British Museums, Australian National University Library, New York Public Library and various European Libraries. Through research, the intellectual heritage would be preserved and the appreciation would make evidence of the Malay ancestors' works on medicine. Although several transliterations of manuscripts have

been published, the number is still small (Mat Piah, 2015). In addition, Salleh, Saari, Abdul Rahman and Mustafa (2019) did emphasize that studies on identifying illness or diseases in Malay medicine must be furthered and refined so it can be used for the treatment of various diseases that are prevalent among the community.

Some of these manuscripts documented the prescriptions for diseases with the utilisation of the germinating part of plants such as *mata kunyit*, *sunti halia* and *lemukut*. These parts of the plant had been used in the treatments of many conditions based on the belief that they are the powerhouse of activity and a good source of energy, enzyme and vitamins (Hussain, 2015). Their medical importance was highlighted in certain manuscripts and has proven its potential as an enhancer in disease cures. Nevertheless, some Malay medical manuscripts made references to the mother rhizome of the medicinal plant, instead of the germinating part for the cure. Although several articles reported that the rhizome parts consist active components of a wide range of pharmacological effects (Abd Razak, Jamaluddin, Abd Rashid, Abd Ghani and Abdul Manan, 2019; Kocaadam and Sanlier, 2017), no scientific reports are available that compare the difference of active ingredients between rhizome and germinating tip. The active components that were reported include curcumin from the rhizome of *Curcuma longa* (Kocaadam and Sanlier, 2017), gingerol, paradol, shogol, zingerone, zerumbone, 1-Dehydr-(10) gingerdione, terpenoids and ginger flavanoids from rhizome of *Zingiber officinale* (Rahmani, Shabrmi and Aly, 2014) and polyphenolic compounds, gamma oryzanol, and vitamin E from rice, *Oryza sativa* (Abd Razak, et al., 2019). Thus, this study was aimed to review the medical use of germinating parts of three material medica namely as '*mata kunyit*' (*Curcuma longa* – *Zingiberaceae*), '*sunti halia*' (*Zingiber officinale* – *Zingiberaceae*) and '*lemukut*' (*Oryza sativa* – *Poaceae*) by traditional Malay practitioners from selected manuscripts.

METHOD

The selection of transliterated Malay Medical Manuscripts was made from Akademi Jawi Malaysia and Perpustakaan Negara Malaysia publication. Six different transliterated manuscripts that have been reviewed in this study were MSS2999 Kitab Tib (Hussain, 2015), Sari Segala Ubat (Tabib Diraja Kesultanan Pontianak) (Mohd Shafri, 2019), Al-Rahmah Fi Al-Tibb Wa Al-Hikmah (Mohd Shafri and Yahya, 2017), Tayyib Al-Ihsan Fi Tibb Al-Insan (Mohd Shafri, 2018), Khazinat Al-Insan ('Abdullah, 2017) and Rumah Ubat di Pulau Penyengat (Mohd Shafri, 2018).

Search Strategy

The terms included to track relevant keywords from the six selected manuscripts are *mata kunyit*, *sunti halia* and *lemukut/lembukut/melukut/ujung beras/ujung lemukut*. The keywords of *ibu kunyit*, *halia* and *beras* were also included in the appraisal as a comparison to the germinating part that has been used in the manuscripts. The search was done manually by referring to the glossary part of each of the transliterated Malay medical manuscripts being screened. The availability of those keywords was then being reviewed and recorded.

Comparison with the contemporary scientific literatures was done using databases such as National Centre for Biotechnology Information (NCBI), Google Scholar, and Science Hub. Keywords used were the combination of local names and scientific names of the germinating tips, their medicinal properties and also the related diseases that use *materia medica* found from the Malay medical manuscripts. The outcome will include any studies regarding the corresponding keywords. Duplicates were identified using Mendeley software while the abstracts and full text were then reviewed based on the information retrieved by the appraisal of the manuscripts.

Study Selection

The five selected transliterated Malay manuscripts were published in the Malay language and another one was published in the English language. All prescriptions that mentioned the medicinal properties of the germinating parts of *Curcuma longa*, *Zingiber officinale* and *Oryza sativa* were included in the study. The use of germinating tips as portion of the remedy are been recorded.

Data Extraction

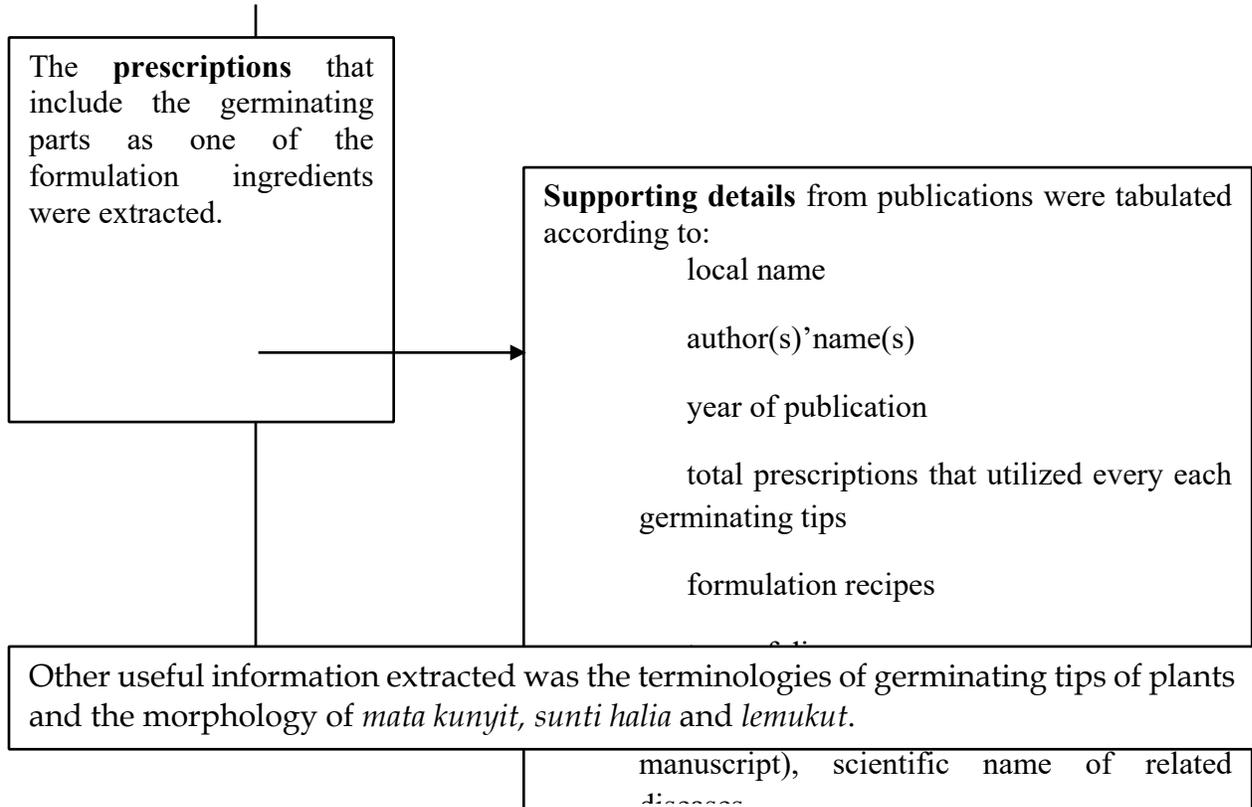


Figure 1 Flow diagram of the data extraction

Analysis of Data

The tabulated data from appraisal of the manuscript were analyzed into frequency of it being mentioned. The combination of two or three different germinating tips in a formulation recipe to treat diseases was analyzed on its importance. Next, the medicinal properties of *Curcuma longa*, *Zingiber officinale* and *Oryza sativa* reported by science contemporary reports were analyzed as supporting details for the type of disease cure prescribed in the manuscripts.

RESULTS

Collectively, *mata kunyit*, *lemukut*, and *sunti halia* were mentioned 13, 10 and 3 times respectively in the three manuscripts (Table 1).

Table 1 Comparison of the total prescriptions of the use of germinating tips (*mata kunyit*, *sunti halia* and *lemukut*) in the three Malay manuscripts.

Manuscripts	Materia Medica (total no. of prescriptions in manuscripts)		
	<i>Mata kunyit</i> (<i>Curcuma longa</i> - <i>Zingiberaceae</i>)	<i>Sunti halia</i> (<i>Zingiber officianale</i> - <i>Zingiberaceae</i>)	<i>Lemukut/hujung lemukut/ lembukut</i> (<i>Oryza sativa</i> - <i>Poaceae</i>)
MSS2999 Kitab Tib	8	0	6
Sari SegalaUbat	5	2	4
Al-Rahmah Fi Al-TibbWa Al-Hikmah	-	1	-
TOTAL	13	3	10

The study found that *mata kunyit* and *lemukut* are repeatedly used in combination to treat diseases such as dysmenorrhoea, parturition, orthostatic hypotension, cough of bronchial asthma, backache, constipation, lethargy, leprosy, ulcers and oedema (Table 2). According to Hussain (2015), they are essentially binders of the other ingredients in the polymaterial prescriptions, making it easy to form a paste for poulticing purposes. Whereas *sunti halia* and *mata kunyit* was used interchangeably as the adding factors in formulations to treat diseases such as dysmenorrhoea and cough (Table 2). Scientifically, the main bioactive compound of the ingredients such as curcumin acts as a bio-enhancer in polymaterial remedies or modern drugs. They improve the bioavailability of a huge number of potent drugs which are poorly bioavailable. This was proven through an in vivo study in Sprague-Dawley rats that received curcumin (60 mg/kg) for four days prior to drug administration (Peterson, Weyers, Steenekamp, Steyn, Gouws and Hamman, 2019).

Table 2 The germinating parts (*mata kunyit, sunti halia and lemukut*) and type of disease cures prescribed in the manuscripts.

Germinating part of plants	MSS2999 Kitab Tib		Sari SegalaUbat (<i>Tabib_Diraja_Kesultanan Pontianak</i>)	
	Local name of diseases	Scientific name of disease	Local name of diseases	Scientific name of disease
Mata Kunyit (<i>Curcuma longa</i> – <i>Zingiberaceae</i>)	<i>Senggugut</i>	Gynecological problem; dysmenorrhoea	<i>Badam</i>	Leprosy
	<i>Meroyan</i>	Gynecological problem; parturition	<i>Seriawan</i>	Ulcers
	<i>Sakit pitam</i>	Orthostatic hypotension	<i>Bengkak</i>	Oedema
	<i>Batuk lelah</i>	Cough of bronchial asthma	<i>Menyucuk</i>	Gastritis
	<i>Sakit pinggang</i>	Back pain	<i>Senggugut</i>	Dysmenorrhoea
	<i>Sembelit</i>	Constipation		
	<i>Letih & lesu</i>	Lethargy		
Sunti Halia (<i>Zingiber officinale</i> – <i>Zingiberaceae</i>)	<i>Balgham</i>	Cough	<i>Qaulanj</i>	Gastroesophageal reflux disease (GERD)
	<i>Senggugut</i>	Dysmenorrhoea		
Lemukut/ hujung lemukut/ lembukut/ melukut/ ujung beras [Broken rice/rice germ] (<i>Oryza sativa</i> – <i>Poaceae</i>)	<i>Sakit pitam</i>	Orthostatic hypotension/ syncope	<i>Badam</i>	Leprosy
	<i>Batuk lelah</i>	Cough of bronchial asthma	<i>Senggugut</i>	Dysmenorrhoea
	<i>Isak / esak</i> (<i>Dewan Bahasa dan Pustaka</i> (2017)	Dyspnea (shortness of breath)	<i>Bengkak</i>	Oedema
	<i>Sakit pinggang</i>	Back pain		
	<i>Letih & lesu</i> <i>Senggugut</i>	Lethargy Dysmenorrhoea		

Based on Table 2, there seems to be a pattern on the common types of diseases in two or three of the manuscripts. Two different manuscripts record that *mata kunyit* and also *lemukut* are used for dysmenorrhoea remedy. The manuscript entitles *Sari Segala Ubat* listed that the three germinating tips can be used to treat this gynecological problem, dysmenorrhoea. This is since curcumin is the bioactive

compound found in *Curcuma longa*. In addition, a recent scientific study found that curcumin synthase is found in *Zingiber officinale* (Zhang, Gao, Wang, Zhang, Liu, Wang, Mo, Liu, Shi and Tu, 2016) and *Oryza sativa* (Morita, Wanibuchi, Nii, Kato, Sugio and Abe, 2010). Curcumin is proven to reduce the severity of pre-menstrual symptoms by increasing serum brain-derived neurotrophic factor (BDNF) levels (Amalraj, Pius, Gopi and Gopi, 2017).

Table 3 Materia medica (*mata kunyit*, *sunti halia* and *lemukut*) associated with the type of disease cures in the manuscripts and their availability in science contemporary reports or relevant scientific evidence.

Materia medica	Disease	Manuscript	Scientific evidence/ report	References	
				Rhizome	Germinating tip
<i>Kunyit/ Mata kunyit</i> (<i>Curcuma longa</i>)	• Leprosy (<i>badam/ kusta</i>)	Sari Segala Ubat	Anti-mycobacteria Monocarbonyl analogs of curcumin were proved their inhibition efficiency of <i>in vitro</i> growth of mycobacterium by disk diffusion and liquid culture assays.	Baldwin, et al., (2015)	-
	• Ulcers (<i>seriawan</i>)	Sari Segala Ubat	Anti-inflammatory, cardioprotective and hepatoprotective effect of curcumin were proved to correlate with its antioxidant activity by animal study using <i>wistar</i> strain rats model.	Naik, et al., (2011)	-
	• Oedema (<i>bengkak</i>) • Abdominal colic (<i>menyucuk</i>)				

Table 3 (Continue)

Materia medica	Disease	Manuscript	Scientific evidence/ report	References	
				Rhizome	Germinating tip
<i>Kunyit/ Mata kunyit</i> (<i>Curcuma longa</i>)	• Dysmenorrhoea (<i>senggugut</i>)	Sari Segala Ubat MSS 2999 Kitab Tib	A reduction in the severity of pre-menstrual symptoms by increasing serum (BDNF) levels by administration dosage of curcumin 100 mg/kg in a clinical trial.	Amalraj, et al., (2017)	-
	• Cough	MSS 2999 Kitab Tib	Cough relieved and asthma prevention	Prasad and Aggarwal, (2011)	-
<i>Halia/ Sunti halia</i> (<i>Zingiber officinale</i>)	• Cough	Sari Segala Ubat	Cough prevention and phlegm (<i>kahak</i>) elimination	Gupta and Sharma, (2014)	-
	• Dysmenorrhoea	Sari Segala Ubat	Pain relief in primary dysmenorrhoea	Rahnama, et al., (2012)	-
<i>Lemukut/ Hujung Lemukut/ Lembukut</i> (<i>Oryza sativa</i>)	• Lethargy	MSS 2999 Kitab Tib	Rice germ is a storehouse of gamma-butyric acid and this could substantiate its use in the treatment of lethargy.	Zhang, et al., (2006)	

DISCUSSION

From the six manuscripts, MSS2999 Kitab Tib by Hussain (2015) and Sari Segala Ubat by Mohd Shafri (2018) were the two manuscripts that record remedies containing all three germinating parts of the plant (Table 1). Meanwhile, manuscript Al-Rahmah Fi Al-Tibb Wa Al-Hikmah (Mohd Shafri and Yahya, 2017) documented only one prescription using *sunti halia* and it has been used as one of the ingredients to treat gastroesophageal reflux disease (GERD) (Table 2). The prescription was written down as below in the manuscript:

'...Bermula ubat qaulanj yg sejuk diambila gelagaru satu sukat, dan habb al rashad satu sukat, dan lada satu sukat, dan **sunti halia** satu sukat, maka dipipis lumat lumat semuanya maka dibubuh sukkar putih pada qadar empat sukatnya, maka dicampur semuanya. Kemudian maka ditelan pagi-pagi...'

Other than that, Tayyib Al-Ihsan Fi Tibb Al-Insan (Mohd Shafri, 2018), Khazinat Al-Insan ('Abdullah, 2017) and Rumah Ubat di Pulau Penyengat (Mohd Shafri, 2018) shown no available keywords of *mata kunyit*, *sunti halia* and *lemukut*. Instead, most of these manuscripts emphasize the term *ibu kunyit*, *halia* and *beras* rather than the germinating tip of the plant.

In terms of terminology, *mata kunyit* has been identified as the germinating part of the rhizome of *Curcuma longa*. Omar (2015) mentioned that this is the most valued part of the *Curcuma longa* rhizome (cited in Hussain, 2015). Germinating parts of the plant had been used in the treatments of many conditions based on the belief that they are the powerhouse of activity and a good source of energy, enzyme and vitamins (Hussain, 2015). Next, *lemukut* has been identified as broken tips of the rice grain that occur during the process of milling and polishing rice. This contains the rice germ, which is the most nutritious part of the grain. It has been found that the 50% of thiamine in a rice grain lies in the germ and it is also rich in protein, fat, enzymes and other B complex vitamins like niacin. It forms one of the best foods for recovery and a great source of hormonal-supportive nutrients and also a source of plant sterols (Hussain, 2015). Correspond to Table 2, *lemukut* proved its use in the treatment of lethargy.

The morphology of *mata kunyit*, *sunti halia* and *lemukut* are illustrated in Figure 2 below.

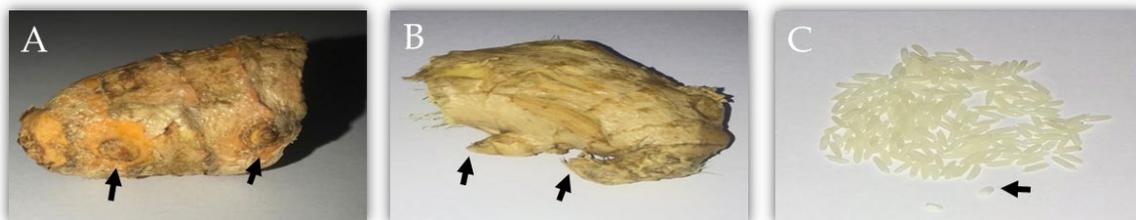


Figure 2. Morphology of the germinating parts of the plants: (A) *mata kunyit*, (B) *sunti halia* and (C) *lemukut*. Black arrows indicate the germinating parts.

Mata kunyit and *lemukut* are repeatedly used in combination to treat diseases such as dysmenorrhoea, orthostatic hypotension, cough of bronchial asthma, back pain, constipation, lethargy, leprosy, ulcers and oedema. As stated by Hussain (2015), it is believed that combining *lemukut* and *mata kunyit* helps in giving the remedy its ability to adhere well to the skin while at the same time provide means of enhancing the effects of the main ingredient. Besides, *mata kunyit* and *lemukut* are essentially binders of the other ingredients in the prescriptions, making it easy to form a paste for poulticing purposes. It is worth noted that *mata kunyit* and *lemukut* are the bio-enhancer in the formulations that can treat almost the same type of disease. This is because the main bioactive ingredient such as curcumin is scientifically proven in terms of drug absorption enhancement (Peterson, et al., 2019).

The materia medica listed in the prescriptions provides a remedy for several diseases. Nevertheless, relevant scientific evidence (Table 3) is only limited to the medicinal properties of the whole rhizome parts. Based on Table 3, *Curcuma longa* and *Zingiber officinale* are essentially used to treat dysmenorrhoea since it is believed that the materia medica contain pain reliever properties, especially for primary dysmenorrhoea. This can be through a reduction in the severity of pre-menstrual symptoms by

increasing brain-derived neurotrophic factor serum levels (Amalraj, et al., 2017). Unfortunately, there is a lack of scientific evidence and reports that specifically mentioned germinating tips. According to the manuscripts, germinating parts are highly specific for the treatment of diseases; however, the germinating tips of *Curcuma longa* and *Zingiber officinale* are limited in scientific reports. The use of germinating tips has been highlighted numerously in Malay folk medicine. Therefore, comparison in terms of constituency level of active ingredients in germinating tips and rhizome is interesting to be explored further through stringent scientific investigations.

CONCLUSION

In conclusion, this study summarises the type of diseases that often utilises the germinating tips of plants locally name *mata kunyit*, *sunti halia* and *lemukut* in the formulation of prescriptions based on six different transliterated Malay medical manuscripts. They present benefits when used in combination to treat certain diseases. Nevertheless, scientific sources available are still small concerning germinating parts of *Curcuma longa*, *Zingiber officinale*, and *Oryza sativa*. Therefore, this paper opens an insight towards an exploratory study towards the importance of highly specific germinating tips known as *mata kunyit*, *sunti halia* and *lemukut* as materia medica.

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