Journal of Science and Technology, Vol. 9 No. 1 (2017) p. 42-49

Ethnomedical Knowledge of Plants Used for the Treatment of Breast Cancer by Jakun community in Kampung Peta Endau Rompin Johor, Malaysia

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Abstract: Breast cancer is the leading death threat for female apart from heart diseases. In Malaysia, the number of individuals experiencing breast cancer is expected to rise. An ethnobotanical study of plants used by the herbalists, local healers, and inhabitants for the treatment of breast cancer was carried out among the indigenous people of Jakun community in Kampung Peta, Johor, Malaysia. Six key informants were selected based on recognition by the Johor National Park staff and information on therapeutic plants were gathered by semi structured questionnaire. There were only five species of plants belonging to 5 genera and 5 families that have been recorded. Most of the plants are set up as juice from fresh plant. 98% of the cures are set up from single plant and taken orally. The utilization of extracts from plant leaves and fruits were usually for the treatment. In all cases, the treatment involved drinking the concentrates for a certain period of time. This study is important to preserve the knowledge of medicinal plants for breast cancer treatment used by Jakun people. The outcome obtained in the study are worth being further investigated for conservation and are also worthy of verifying their ethnomedical claims scientifically.

Keywords: Breast cancer, Ethnomedical, Medicinal plants, Indigenous people, Jakun.

1. INTRODUCTION

Ethnomedicine is the study or correlation of the herbal medicine practice by different ethnic societies, and particularly by indigenous people [1]. Conventional knowledge usually is the long-standing customs and practices of certain territorial, indigenous or local inhabitants including the insight, information, and practices of the indigenous people. It constitutes a combined group of information, know-how, practices, and portrayals kept up and created by the general population with amplified histories of connection with the common habitat [2, 3]. Traditional Medicine is the all knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness [4-7]. Herbalist or traditional healers are common in every community, and frequently part of the society, custom and culture, and keep on having high social ranking, applying impact on wellbeing of the local people in heath related issues. Their activities are on both physique and mind together to aid cure of sickness. Know-how of therapeutic plants and their utilization by native healers are not just valuable for preservation of social customs and biodiversity, additionally for society services and medication advancement in the present and future [8]. Since the onset of this era, there has been an expanding enthusiasm for the investigation of therapeutic plants and their customary use in various globally [9]. Over a period of time, traditional medicine has become a focus of world significance, making an influence on both world health and global trade. Therapeutic plants continue to play a central role in the healthcare system of large capacities of the world's population [10]. This is especially valid in creating nations, where home grown medicinal plants has a long and continuous history of utilization. Consistent use of natural solution by an extensive extent of the populace in the creating nations is generally because of the high cost of modern pharmaceuticals and human services. As indicated by the World Health Organization (WHO), 3.5 billion individuals in the developing world rely on upon

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therapeutic plants as a major aspect of their essential human services [9]. Additionally as indicated by the WHO; 80% of the world's population rely on upon herbal medicine for their primary health services [11]. There are extensive monetary advantages in the improvement of indigenous drugs and in the utilization of therapeutic plants for the treatment of different illnesses [12, 13].

Use of medicinal plants is an integral part of Malaysians more especially the indigenous people, and this is unconvincing to change in the years arisen. The concept of ethnobotanical knowledge has originated from local people, which has the capacity in remediating some of the inadequacies of contemporary Western knowledge. It is passed down from era to era and firmly entwined with individuals' social qualities [14]. Traditional societies throughout the world hold a wealth of such knowledge which they have built up during prolonged interactions with the natural world and which remains fundamental to their physical, spiritual, and social interests [15]. While plants can provide multiple uses, the traditional curative practice of health problem is among the most important ones for peoples' lives and it is also one of the sources of modern health treatment [16]. The vegetation of the world is thus full of opportunities for discovering of new drugs. Undoubtedly many more secrets that are still hidden in the plants, these resources are found in locally available plants and they benefit from traditional knowledge (TK) that is simple to use and affordable. Reasonable support for traditional medicinal plants will not only help bridge some of the gaps between the demand for and supply of modern pharmaceuticals, but also widen healthcare alternatives for posterity [14]. Other than that, there is a worldwide unanimity on the advantages of phytopharmacy and at present therapeutic plants involve a key position in plant research and medication. These realities are related with the dynamic loss of traditional knowledge, because of mass migration, and with the dangers to which the Plant Genetic Resources (PGR) are uncovered, makes the efforts to study and save PGR pertinent in each regard [2].

Malaysia is positioned as the twelfth mega diverse nation on the planet because of its wealth and ingeniousness of widely varied vegetation. In Malaysia, Peninsular region was assessed to have about 2,000 types of therapeutic plants and around 200 species being utilized by various ethnic communities within Malaysia [17]. This study was conducted to document and preserve the ethnomedical knowledge of medicinal plants in the treatment of breast cancer by indigenous people of Jakun community.

Breast cancer is increasingly common in Malaysia, According to Omar et al., 2011, a total of 3,242 new cases of breast cancer were reported in Malaysia in 2007, giving an age-standardized incidence rate of 29.1 per 100,000 women [18]

It was estimated that yearly rate of cancer in Malaysia is 30,000. In 1998, population of Malaysia was 21.4 and the frequency of cancer is projected to grow in aged populace, the percentage of 60 years and above was 4.6% in 1957, step up to 5,7% in 1990 and is predictable to be 9.8% in 2020 [19]. In appraisals, nearly 90-100,000 individuals Malaysia are experiencing cancer at a time. In Malaysia, there was insufficient data on incidence of cancers until when National Cancer Registry (NCR) was introduced in June 2003. In the 2003, 3738 newly cases of BC accounted to the NCR in women indicates the Age Standardized Rate (ASR) of 46.2 per 100,000 [18, 20, 21] and ASR 47.4 per 100,000 [22]. This means that 1 in 20 women in Malaysia will develop breast cancer in their lifetime. However, the rate differs between the three main races, the Malays, Chinese and Indians. The age standardized incidence in Chinese is the highest, with 59.7 per 100,000 followed by the Indians at 55.8 per 100,000. The Malays have the lowest incidence of 33.9 per 100,000. This translates into 1 in 16 Chinese women, 1 in 16 Indian women and 1 in 28 Malay women will develop breast cancer at some stage in their lives [21]. The frequency is greater in Chinese (59.9 per 100,000) followed by Indians (54.2) and Malay (34.9) NCR records 21,773 Malaysians being identified with cancer but count on nearly 10,000 cases that are not documented annually. It is predicted that 1:4 will experience cancer at the age of 75 [22]. Growing population and lengthier lifetime adds to increase of cancer. Below 10% of cancers

happen in children when relates with men to (over 50%) and 35% in women above 50 years of age. The incidence of cancer is more in females than males with a ratio of 1:1.2 [23]. Findings indicates 10.3% of Malaysians has possibility of vanishing from cancer before attaining the age of 75 [24].

The term Orang Asli is use to describe the indigenous peoples in Peninsular Malaysia. In Malaysia, there are about 150,000 peoples distributed among the 18 different tribes of Orang Asli, covering 0.5% of the entire Malaysian populace [17]. They are grouped into three main divisions: Negrito (northern district), Senoi (Middle region), and Proto-Malay (southern area). Jakun is a tribe from a subgroup of Proto-Malay and is the most prevailing in Johor. The Jakun people group of Kampung Peta are relatives of the main occupants of Endau River valley. The number of inhabitants in Jakun people group in Kampung Peta is around 220 individuals with 67 family units, about 2% of the entire Orang Asli in Johor [17]. Traditional medicine in Orang Asli community is still practicing as conventional way of life in the midst of present day offices and firmly cling to their progenitors' convictions as their lifestyle. They speak the Jakun vernacular which is a sub lingo of the Malay dialect. Their work depends vigorously on common assets around them, which incorporates blend of angling, hunting, cultivating, and exchanging harvest from the forest. Recently there are indications that gigantic changes in their way of life. Because of financial change, the more youthful era of Jakun can get advanced education and many have moved to different settlements [25].

2. Material and Methods

2.1 Study Area

Endau Rompin forest (2° 25′ 12.94″N, 103° 15′ 40.94″E) is one of the few outstanding regions of swamp rain forest in the southern part of Peninsular Malaysia. This region, it is one of the territory Asian's southernmost tropical rain forest. In 1993, 48,905 hectares of the Endau Rompin backwoods was published as a national stop by the state legislature of Johor [26]. Kampung Peta is a settlement situated beyond the limits of the park (Fig. 1).

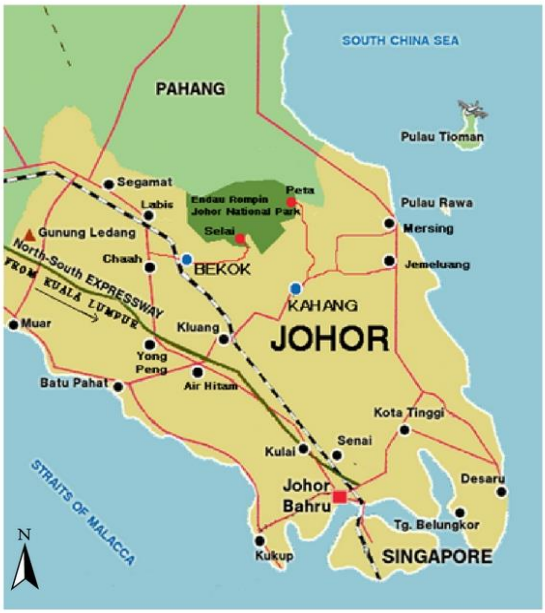

Fig. 1 Location of Endau Rompin Johor National Park and Kampung Peta [17].

Kampung Peta has turned into the primary access to Endau Rompin Johor National Park in the district of Mersing, Johor. Inside the rich swamp blended dipterocarp forest of the park lie different types of plants that give considerable sources to sustenance, solutions, covers, timber items, and numerous more to the close-by human progress [27].

2.2 Ethical Authorizations

Endorsement from Orang Asli Development Department (JAKOA) under the Malaysia Ministry of Rural and Regional Development was obtained. Plants were collected under permission affirmed by Johor National Parks Corporation (JNPC) (P.T.N.J. 3/8/1). Written Prior Informed Consent (PIC) was acquired.

2.3 Data collection

Information was obtained from the traditional healers using a semi-structured questionnaire. The survey was carried out from July to December 2016, after their informed consent. Some of the questions asked are (i) the traditional healer or herbalist identity (name and surname, sex, age, religion, marital status and educational level), (ii) knowledge origin, (iii)

number of trainees within and outside community (iv) duration of their practice (v) the plants use in the treatment of breast cancer using symptoms of the disease, and (iv) their experience of traditional knowledge outside their community. And on the other hand information was also gathered on (i) information about medicinal plants used by the Jakun that is related to signs and symptoms of breast cancer (breast swelling, skin irritation or dimpling, breast pain, nipple pain, redness and rash on or around a nipple, presence of scale, or thickening of skin or nipples, discharge from the nipple apart from breast milk and under arm lump), plants local names, parts used, preparation method, administration and dosage, and; (iii) historic aspects of Jakun's traditional knowledge such as beliefs or taboos related to the plants. Selection criteria were also grounded on (i) their respect as local practitioners by the society (ii) their capacity to recognize plants and elucidate the uses, and (iii) the endorsement by park staff for their participation in traditional herbal medicine. Six key informants of Jakun community were selected from Kampung Peta as shown in Table 1 every informant has immense knowledge in the areas of customary practices, herbal formulations, field identification, and collection of medicinal plants.

2.4 Plant identification

After the interviews was conducted, first documentation of the plants was done in the pitch by a one of the Johor national park staff. Plants specimens were further confirmed by giving a voucher specimens number at the Herbarium of the Department heritage and technology, Universiti Tun Hussein Onn Malaysia. Other regular data such as location, collector`s name, period of collection, habitat description, vegetation, and plant local names were documented at the field site. After that, specimens were prepared for herbarium, and pictures were taken to aid in the validation of the plants. Plants were identified using morphometric techniques applied in structurally-based research, in many cases, species (or higher taxa such as genera or families) can be distinguished by characters derived from their leaf or flower shape, or their branching structure [28].

The six key informants were all females, with ranging ages from 44 to 57 years. However, they were people who acquired their knowledge of curative uses of plants from either friends, family members or parents as seen in Table 1. In spite of the fact that they are not viewed as the native specialists or herb doctors, they are herbal medicinal professionals that would really depict the plants and extremely acquainted with the researcher. Moreover, the key informants were acquainted with the researcher in view of affirmation by their own tribe [17].

3 RESULTS AND DISCUSSION

3.1 Locally used medicinal plants

Medicinal plants that are used locally for the treatment of breast cancer are summarized in Table 2. Five plants were recorded as useful in the breast cancer treatment and other related diseases among the orang Asli of Jakun community in Kampung Peta. Based on experience from the key informants, the local people use this plants and was found to be effective without any side effect both during and after the treatment.

3.2 Plant`s Ethnomedical Knowledge

Table 2 is the summary of ethnomedical knowledge of the plants. Collectively five species of therapeutic plants were acknowledged in this survey. From Table 2, all the five plants species were from different families and genera with representation of the following: Arecaceae, Rubiaceae Dilleniaceae, convulvulaceae and Moraceae. The plant families consist of various hierarchy such as trees (2 species), shrubs (1 species), palm (1 species), and hydrophytes (1 species). *M. citrifolia* was cited by all the informants followed by *D. ensifolia* cited three times then *P. limosa* and *I. aquatic* cited two times each, and finally *A. altilis* cited by only one of the respondent.

Table 1: Profiles of respondent.

Code	Sex	Age	Marital status	Religion	Source of Knowledge	practice Duration	Level of Education	Occupation	Number of trainees
R1	F	46	Married	Islam	Parents	3 years	Primary school	Herbalist	415
R2	F	57	Widow	Animism	Friends & community	6 years	Primary school	Herbalist	3
R3	F	45	Married	Animism	Friends & community	At teenage age	Primary school	House wife	3
R4	F	57	Married	Animism	Family members	Since young	Primary school	House wife	3
R5	F	56	Married	Animism	Family	Since young	Primary school	House wife	3
R6	F	44	Single	Islam	Family	Since young	Primary school	Staff TNJ	4

Key: R1–R6 stand for informant's name. R1: Azizah Hussien, R2: Serai Binti Muda, R3: Nari A/P Mahdi, R4: Kikai Bte Akar, R5: Moi Kantan, R6: Raina Bt Jala F: female.

Table 2: locally used medicinal plants for breast cancer treatment by Jakun community.

S/no	Plant name	Family	Local name	Part used	Preparation Methods	Ways of administration	Symptoms
1.	*Dianella ensofolia* (L) DC	Xanthorroeaceae	Setanggi	Root	Boiling	Oral: drink 3 times/day	Redness, swelling and rashes or itching in the breast
2.	*Artocarpus altilis* (Parkinson)	Moraceae	Sukun	Fruits	Boil	Oral: drink 3 times/day	Holes and rashes in the breast
3.	*Ipomoea aquatica* (Forssk)	Convulvulaceae	Bunga kankung	Leaves	Boil	Tie around the breast	Itching, redness rashes, and discharge from the breast
4.	*Morinda citrifolia* (L)	Rubiaceae	Mengkudu	Fruits Seeds Shoot	Slice and boil Boil	Drink/eat raw Eat raw Oral: drink 3 times/day	Thickening of and itching of nipple, hardness of the breast.
5.	*Pinanga limosa* (Ridl., J)	Arecaceae	Puteri	Seeds	Blend and boil	Oral: drink 3 times/day	Rashes and itching Swelling, discharge and other breast problem

3.3 Used Parts

Different part of plants was utilized for the preparation of traditional medicine. Generally, fruits, and seeds were the most used parts representing 60% of all plants recorded. This is followed by leaves 30% root and shoot with 10% each. As per sources, the fruit and seeds are the main plant parts used in the Jakun traditional medicine for the listed species used in the treatment of breast cancer. This is clear signs that fruits, seeds and leaves of plants are very rich in secondary metabolites [29, 30], for example, glycosides, triterpenoids, flavonoids, steroids, saponins, tannins, alkaloids, sugar and vitamin C [31-34]. Three of plants species of the documented medicinal plants were used alone or singly, while the remaining two were mentioned to be used in mixture with other plants to either remove odor or reduce bitterness of the plant.

3.4 Preparation and Administration

In the Jakun community, traditional medicines are usually prepared fresh or on the other hand the parts of plant are also been dried (more especially the roots) and preserve them in an appropriate stockpiling before use. The most widely recognized technique for preparation was boiling and decoction in water followed by eating the plant parts raw. Decoction in water is equal to water extraction and it appears to be much practiced due to the fact that it can be easily prepared. Furthermore, water is the paramount solvent to dissolve hydrophilic compounds that are main agents for various antimicrobial activities. In this survey, the most typical way of administration was taken in a form of drink (90%) and rapping (10%). These components may clarify the generally great relationship amongst readiness and organization of natural cures, and more than seventy-five percent of the recorded plant species (87%) were taken orally when contrasted with those taken for topical applications (4%).

3.5 Medicinal Plants and Forbids

Traditional knowledge practices in Jakun community has do and don’ts like any other, a couple considerations need or must be taken after amid the plant accumulation, preparation, and treatment to guarantee viability. For therapeutic purposes, restorative plants ought to be gathered in specific settings, for example, amid the full moon or at early hour in the morning. To be sure, time of collection is a conceivable wellspring of variety for the bioactivity of the concentrates. They are especially precluded to gather plants amid "hujan panas" or summer rain. They trust that late spring precipitation brings unsafe impacts on the gatherer's wellbeing and the plants may contain dangerous metabolites. Furthermore, they know about safety and more specifically issues in administration.

4.0 CONCLUSION

The present report gives a complete data on the most widely recognized and esteemed medicinal plants of Jakun in Kampung Peta, for the treatment of breast cancer, to the extent as far as anyone is concerned, there are no detailed information accessible on the ethnomedicinal knowledge of plant species for the site of the survey for breast cancer. The present report found that the survey site an affluent in curative medicinal plant and ethno medicine is still more common over modern one. Five medicinal plants were documented, fruit, leaves and seed are the most used parts while only 1 plant was reported to be used as whole plant during the ethnomedicinal survey in the study site. All the plants were found efficient and have action against breast cancer from the literature. It is prescribed that reported therapeutic plants having intense activity for breast cancer need be screened for pharmacological activities. This report is a benchmark information for stake holders in pharmaceutical industries and research establishments to choose esteemed plant with high utilize values for further screenings to find new drugs.

Acknowledgement

The authors are very grateful to Department of Orang Asli Development (JAKOA) under the Malaysia Ministry of Rural and Regional Development for the approval to conduct the research, and dedicated staffs of Johor National Parks corporation (JNPC), for assistance during fieldworks and permission to carry out research, Universiti Tun Hussein Onn Malaysia (UTHM) for offering the *Geran Penyelidik Pasca Siswazah (*GPPS Vot: U608*),* and finally we are obliged to every respondent for sharing their important information on medicinal plants and to all Jakun people of Kampung Peta for their cordiality and hospitality.

Competing interests

The authors declare that they have no competing interests.

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