

## ORIGINAL ARTICLE

# Medicinal Plants in the Khok Pho District, Pattani Province (Thailand)

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## ABSTRACT

A survey on utilization of medicinal plants by herbalists in Khok Pho District, Pattani Province, Thailand was carried out by interviewing herbalists, collecting and identifying the plant specimens, and also comparing the plant specimens with the authentic specimens at two herbaria, i.e. at the Bangkok Herbarium, Botany Section, Botany and Weed Science Division, Department of Agriculture, Ministry of Agriculture and Cooperatives and at the Forest Herbarium, National Park, Wildlife and Plant Conservation Department. Ninety-five medicinal plants belonging to fifty-seven families commonly used as medicinal plants are reported. Of these ninety-five species, fourteen species are newly recorded as medicinal plants. Thirty-nine species are used in combinations with other medicinal plants in a total of sixteen different preparations.

**Keywords:** Medicinal Plants, Pattani Province, Thailand

## สมุนไพรพื้นบ้าน อำเภอโคกโพ จังหวัดปัตตานี ประเทศไทย

วงศ์สถิตย์ ฉั่วกุล

ภาควิชาเภสัชพฤกษศาสตร์ คณะเภสัชศาสตร์ มหาวิทยาลัยมหิดล

### บทคัดย่อ

การสำรวจสมุนไพรพื้นบ้าน อำเภอโคกโพ จังหวัดปัตตานี ประเทศไทย โดยสัมภาษณ์หมอพื้นบ้านเกี่ยวกับสมุนไพรที่ใช้ ชื่อพื้นเมือง ส่วนที่ใช้ทำยา พร้อมทั้งสรรพคุณและวิธีใช้ เก็บตัวอย่างสมุนไพร จัดทำเป็นตัวอย่างพืชแห้ง ตรวจสอบเอกลักษณ์พืชด้วยรูปวิธาน และเปรียบเทียบตัวอย่างพืชที่พิพิธภัณฑ์พืชสิรินธร กรมวิชาการเกษตรและหอพรรณไม้ กรมอุทยานแห่งชาติ สัตว์ป่า และพันธุ์พืช กระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม รวบรวมสมุนไพรได้ทั้งหมด 95 ชนิด ซึ่งจำแนกเป็นสมุนไพรรวม 57 วงศ์ ประกอบด้วย

พืชใบเลี้ยงคู่ 42 วงศ์ 72 ชนิด พืชใบเลี้ยงคู่ 13 วงศ์ 21 ชนิด พืชเมล็ดเปลือย 1 วงศ์ 1 ชนิดและพืชเฟิร์น 1 วงศ์ 1 ชนิด สมุนไพรจำนวน 39 ชนิด ใช้ในรูปยาตำรับร่วมกับสมุนไพรอื่นรวม 16 ตำรับ

## INTRODUCTION

Pattani is one of fourteen provinces in the southern part of Thailand. This province has large forest areas with a high degree of biodiversity where many natural resources such as wild animals, medicinal as well as edible plants are conserved. There are many herbalists promoting the utilization of medicinal plants. Apart from sixty (1) medicinal plants used in the primary health care project by the Ministry of Public Health, there are many other indigenous medicinal plants prescribed by herbalists which are not included in this recommendation. A survey was carried out to identify these plants and their medicinal uses in order to continue indigenous knowledge about folk medicines and to search for new potential candidates modern drugs investigation and development.

## MATERIALS AND METHODS

This survey was performed by interviewing five herbalists, Mr. Khrun Naeopradap the chief herbalist, Mr. Sombun Thipnui, Mr. Prakop Ubonkhao, Mr. Yong Thongmi and Mr. Nu Lisawat about the medicinal plants commonly used and collecting their plant specimens for taxonomical identification during July 1996 to June 1997. The collected specimens were compared with the authentic specimens at

two herbaria, i.e. at Botany Section, Botany and Weed Science Division, Department of Agriculture and at Department of Forestry, Ministry of Agriculture. The voucher specimens were deposited at Department of Pharmaceutical Botany, Faculty of Pharmacy, Mahidol University.

## RESULTS AND DISCUSSION

During the survey ninety-five species of commonly used medicinal plants were identified and collected. The botanical name, Thai name, parts used, ethnomedical use, and preparation of the plants are shown in Table 1. The distribution of the medicinal plants over different families, listed in Table 2, shown that the LEGUMINOSAE (FABACEAE) forms the largest group (nine different species). After proper taxonomical identification, these plants could be assigned to four groups: seventy two dicots, twenty one monocots, one gymnosperm and one fern. Eighteen, twelve, nine and eight different species of medicinal plants are used as antipyretic, diuretic, hematinic and tendon tonic, respectively, as shown in Table 3. Fifty-six species of (marked S in Table 1) medicinal plants are used as a single remedy whereas thirty-nine species (marked C in Table 1) are used in combinations with other medicinal plants in a total of sixteen preparations as shown in Table 4.

Table 1 Medicinal Plants Used in Khok Pho District, Pattani Province

Botanical Name	Thai name	Part(s) Used	Uses	Methods (Formulas)	Voucher/Authentic Specimen (References)
<b>DICOTYLEDONS:</b>					
<b>ACANTHACEAE</b>					
<i>Acanthus ebractertus</i> Vahl <sup>CT1</sup>	I Kreng	AP	for skin inflammation	BT(1)	Chuakul 823/BK 36594 <sup>2,3</sup>
<i>Rhinacanthus nasutus</i> (L.) Kurz <sup>C</sup>	Thong Phan Chang	AP	antipruritic	DC(2)	Chuakul 818/BK 48329 <sup>2,3</sup>
<b>AIZOACEAE</b>					
<i>Sesuvium portulacastrum</i> L. <sup>SN</sup>	Phakbia Thale	WP	treatment of insect bites	DC	Chuakul 885/BK 36135 <sup>2,4</sup>
<b>AMARANTHACEAE</b>					
<i>Amaranthus spinosus</i> L. <sup>CT2</sup>	Phak Khom Nam	WP	hematinic	DC(4)	Chuakul 837/BK 39051 <sup>5,6</sup>
<b>ANNONACEAE</b>					
<i>Rauwenhoffia siamensis</i> Scheff. <sup>C</sup>	Nom Maeo	FL	treatment of herpes simplex, herpes zoster	PT(5)	Chuakul 867/BK 54771 <sup>7,8</sup>
<b>APOCYNACEAE</b>					
<i>Cerbera odollam</i> Gaertn. <sup>CT2</sup>	Tin Pet Thale	ST	tendon tonic	DC(7)	Chuakul 812/BK 15378 <sup>2,9</sup>
<i>Wilughbeia edulis</i> Roxb. <sup>SN</sup>	Ka Tang Ka Tio	ST	treatment of yaws and oozing eczema due to lymphatic disorders	DC	Chuakul 906/BK 61378 <sup>9,10</sup>
<b>ARALIACEAE</b>					
<i>Schefflera heterophylla</i> (Wall.&G.Don) Harms <sup>SN</sup>	Khan Ham Suea	LF	antipyretic	DC	Chuakul 899/BK 10772 <sup>2</sup>

Table 1 Medicinal Plants Used in Khok Pho District, Pattani Province (Contd.)

Botanical Name	Thai name	Part(s) Used	Uses	Methods (Formulas)	Voucher/Authentic Specimen (References)
<b>ASCLEPIADACEAE</b>					
<i>Cryptolepis buchanani</i> Roem.&Schult. <sup>C</sup>	Thao En On	ST	tendon tonic	DC (7, 15)	Chuakul 813/BKF 99766 <sup>8</sup>
<i>Dischidia benghalensis</i> Colebr. <sup>SN</sup>	Thao Wan Duan	LT	for ringworm and tinea versicolor	LT/LA	Chuakul 882/BK 16225 <sup>11</sup>
<i>Hoya micrantha</i> Hook. f. <sup>SN</sup>	Lin Kra Bue	LF	for jaundice	PT	Chuakul 898/BK 52977 <sup>12</sup>
<b>AVICENNIACEAE</b>					
<i>Avicennia marina</i> (Forsk.) Vierh. <sup>ST13</sup>	Samae Thale	WD	to relieve body pain, abnormal menstruation	DC	Chuakul 871/BK 47702 <sup>13</sup>
<b>BOMBACACEAE</b>					
<i>Durio zibethinus</i> Murr. <sup>C</sup>	Thu Rian	FB	hematinic	DC (4)	Chuakul 835/BK 02814 <sup>5</sup>
<b>CELASTRACEAE</b>					
<i>Salacia chinensis</i> L. <sup>ST11</sup>	Kam Phaeng Chet Chan	ST	for abnormal menstruation, to relieve skin problems, to relieve body pain	DC	Chuakul 870/BK 44530 <sup>14</sup>
<b>COMPOSITAE (ASTERACEAE)</b>					
<i>Centipeda minima</i> (L.) A. Braun & Asch. <sup>C</sup>	Kratai Chan	WP	for mouth infection, mouth cancer	DC (6)	Chuakul 839/BK 43576 <sup>2,15</sup>
<i>Pluchea indica</i> (L.) Less. <sup>CT11</sup>	Khlu	WP RT	for skin inflammation antipyretic	BT (1) DC	Chuakul 820/BK 13416 <sup>3</sup>

Table 1 Medicinal Plants Used in Khok Pho District, Pattani Province (Contd.)

Botanical Name	Thai name	Part(s)	Uses Used	Methods	Voucher/Authentic Specimen (Formulas) (References)
<b>CONVOLVULACEAE</b>					
<i>Cuscuta chinensis</i> Lam. <sup>S</sup>	Foi Thong	WP	tendon tonic	DC	Chuakul 831/BK.37531 <sup>16</sup>
<b>DILLENIACEAE</b>					
<i>Tetracera indica</i> (Christm.&Panz.) Merr. <sup>SN</sup>	Thao Ora Khon	RT	diuretic	DC	Chuakul 846/BK.51791 <sup>17</sup>
<i>Tetracera loureiri</i> (Finet&Gagnep.) Pierre ex Craib <sup>S</sup>	Rot Su Khon	RT	diuretic	DC	Chuakul 847/BK.38259 <sup>17</sup>
<b>DIPTEROCARPACEAE</b>					
<i>Hopea odorata</i> Roxb. <sup>S</sup>	Takhian Thong	WD	to relieve paralysis	DC	Chuakul 861/BK.39746 <sup>18</sup>
		WD	antihemorrhoid	PD/LA	
<b>EUPHORBIAEAE</b>					
<i>Acalypha lanceolata</i> Willd. <sup>ST2</sup>	Khrao Maeo	LF	expectorant	CF	Chuakul 857/BK.409091 <sup>19</sup>
<i>Antidesma ghaesembilla</i> Gaertn. <sup>C</sup>	Mao Khai Plaa	FL	to relieve herpes simplex, herpes zoster	PT (5)	Chuakul 869/BKF.84069 <sup>19</sup>
<i>Chaetocarpus castanocarpus</i> (Roxb.) Thwaites <sup>S</sup>	Samphao	RT, ST	tendon tonic	DC	Chuakul 848/BK.51607 <sup>19</sup>
<i>Hymenocardia punctata</i> Wall. ex Lindl. <sup>ST2</sup>	Faep Nam	YL	anthelmintic, antihemorrhoid	DC	
		ST	diuretic	DC	Chuakul 881/BK.38254 <sup>19</sup>

Table 1 Medicinal Plants Used in Khok Pho District, Pattani Province (Contd.)

Botanical Name	Thai name	Part(s) Used	Uses	Methods (Formulas)	Voucher/Authentic Specimen (References)
<b>EUPHORBACEAE (contd.)</b>					
<i>Jatropha multifida</i> L. <sup>ST2</sup>	Malako Farang	WS	for stomach pain	DC	Chuakul 832/BK 61880 <sup>19</sup>
<i>Phyllanthus amarus</i> Schum. &Thonn. <sup>CT3</sup>	Luuk Tai Bai	WP	antipyretic	DC(3)	Chuakul 843/BK 61035 <sup>3</sup>
<i>Phyllanthus urinaria</i> L. <sup>CT3</sup>	Yaa Tai Bai	WP	antipyretic	DC(3)	Chuakul 824/BK 21343 <sup>3</sup>
<i>Shirakopsis indica</i> (Willd.) Esser <sup>ST3</sup>	Samo Thale	LF	oxytotic in post-labour	DC	Chuakul 872/BK 22205 <sup>21</sup>
<b>LABIATAE (LAMIACEAE)</b>					
<i>Leucas zeylanica</i> (L.) R.Br. ex Spreng. <sup>SN</sup>	Yaa Prik	LF	for cough	ME	Chuakul 855/BK 58728 <sup>2</sup>
<i>Clerodendrum inerme</i> (L.) Gaertn. <sup>S</sup>	Samma Nga	WP	anthelmintic in children	PT	Chuakul 873/BKF 67525 <sup>3</sup>
<i>Clerodendrum serratum</i> (L.) Moon var. <i>serratum</i> Schau. <sup>ST1</sup>	Akkhi Thawan	RT	to relieve varicose vein antihemorrhoid	DC(13) LA	Chuakul 830/BKF 96213 <sup>8</sup>
<b>LAURACEAE</b>					
<i>Cinnamomum porrectum</i> (Roxb.) Kosterm. <sup>S</sup>	Thep Tharo	WD	heart tonic	PD	Chuakul 908/BK 60803 <sup>21</sup>
<b>LEGUMINOSAE-MIMOSOIDEAE</b>					
<i>Acacia concinna</i> (Willd.) DC. <sup>CT3</sup>	Som Poi	LF	for skin inflammation	BT(1)	Chuakul 821/BK 08147 <sup>22</sup>
<i>Adenanthera microsperma</i> Teijsm. & Binn. <sup>S</sup>	Ma Klam Ta Kai	SD	expectorant	PI	Chuakul 905/BK 50998 <sup>22</sup>
<i>Archidendron jiringa</i> (Jack) Nielsen <sup>ST3</sup>	Cha Niang	RT	diuretic	DC	Chuakul 916/BK 39726 <sup>22</sup>

Table 1 Medicinal Plants Used in Khok Pho District, Pattani Province (Contd.)

Botanical Name	Thai name	Part(s) Used	Uses	Methods (Formulas)	Voucher/Authentic Specimen (References)
<b>LEGUMINOSAE-CAESALPINIOIDEAE</b>					
<i>Caesalpinia crista</i> L. <sup>SNT3</sup>	The Phi	LF	carminative	PD	Chuakul 878/BKF 77985 <sup>23</sup>
<i>Caesalpinia sappan</i> L. <sup>CT2</sup>	Fang	WD	hematinic	DC (4)	Chuakul 838/BK 61534 <sup>23</sup>
<i>Saraca indica</i> L. <sup>S</sup>	Sok	RT	antipyretic	DC	Chuakul 901/BK 43678 <sup>23</sup>
<i>Senna siamea</i> (Lam.) Irwin&Barneby <sup>C</sup>	Khi Lek	LF	hematinic	DC (4)	Chuakul 943/BK 07703 <sup>23</sup>
<b>LEGUMINOSAE-PAPILIONOIDEAE</b>					
<i>Derris scandens</i> (Roxb.) Benth. <sup>C</sup>	Thao Wan Priang	ST	hematinic	DC (4)	Chuakul 836/BK 48305 <sup>3</sup>
<i>Tadehagi triquetrum</i> (L.) Ohashi <sup>C</sup>	Kho Kio	LF	for skin inflammation	BT (1)	Chuakul 822/BK 61113 <sup>15</sup>
<b>GENTIANACEAE</b>					
<i>Fagraea fragrans</i> Roxb.	Kan Krao	WD	tendon tonic	DC (7, 15)	Chuakul 853/BK 59269 <sup>3</sup>
		WD	laxative, to promote longevity	DC	
<b>GUTTIFERAE (CLUSIACEAE)</b>					
<i>Garcinia atrovirens</i> Griff. <sup>S</sup>	Som Khaek	FR	relief of cough	EP	Chuakul 912/BKF 81142 <sup>21</sup>
<b>MALVACEAE</b>					
<i>Hibiscus tiliaceus</i> L. <sup>SN</sup>	Khi Lek Kho Kiu	RT	diuretic	DC	Chuakul 874/BKF 91407 <sup>21,24</sup>
		FR	expectorant	EF	
<b>MELASTOMACEAE</b>					
<i>Melastoma malabathricum</i> L. var. <i>malabathricum</i> <sup>STI</sup>	Khlong Khlang	RT	antipyretic, anticancer	DC	Chuakul 828/BK 36038 <sup>25</sup>

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Botanical Name	Thai name	Part(s) Used	Uses	Methods (Formulas)	Voucher/Authentic Specimen (References)
<b>MELIACEAE</b>					
<i>Lansium domesticum</i> Corrêa <sup>N</sup>	Langsat	SD	for abscesses	LA	Chuakul 913/BKF 90229 <sup>26</sup>
<b>MORACEAE</b>					
<i>Artocarpus elasticus</i> Reinw. ex Blume <sup>CN</sup>	Ka Ok	LF	for ringworm and tinea versicolor	LA (12)	Chuakul 827/BK 23500 <sup>21</sup>
<b>MYRSINACEAE</b>					
<i>Horsfieldia irya</i> (Gaertn.) Warb.	Kruai	RS	treatment of furred tongue with granular surface	LA	Chuakul 851/BK 41649 <sup>27</sup>
<i>Knema globularia</i> (Lamk.) Warb. <sup>S</sup>	Han	SD	insecticide	MU	Chuakul 880/BK 20350 <sup>27,28</sup>
<b>MYRSINACEAE</b>					
<i>Embelia ribes</i> Burm. f. <sup>S</sup>	Som Kung	ST, RT	treatment of hemorrhoid	DC	Chuakul 904/BK 42122 <sup>29</sup>
<b>MYRIACEAE</b>					
<i>Melaleuca cajuputi</i> Powell <sup>CT3</sup>	Samet	SB	anti-inflammatory for oedema	LA (9)	Chuakul 854/BK 57137 <sup>30</sup>
		DF	heart tonic	DC	
		YL	carminative	EF	
<i>Rhodomerytus tomentosa</i> (Aiton) Hassk. <sup>SN</sup>	Phruat	RT	antipyretic, antidiarrheal, antidysenteric	DC	Chuakul 849/BK 37910 <sup>30</sup>



Table 1 Medicinal Plants Used in Khok Pho District, Pattani Province (Contd.)

Botanical Name	Thai name	Part(s) Used	Uses	Methods (Formulas)	Voucher/Authentic Specimen (References)
<b>OLACACEAE</b>					
<i>Otax psittacorum</i> (Willd.) Vahl <sup>S</sup>	Nam Chai Khrai	RT, ST	relieve body pain	DC	Chuakul/BKF 93272 <sup>21</sup>
<b>OPILJACEAE</b>					
<i>Lepionurus syhvestris</i> Blume <sup>C</sup>	Mak Mok	RT	tendon tonic	DC (15)	Chuakul 816/BK 38880 <sup>31</sup>
<b>PIPERACEAE</b>					
<i>Piper betle</i> L.	Phlu	LF	to relieve herpes zoster	LA (10)	Chuakul 945 <sup>3</sup>
<b>RAFFLESACEAE</b>					
<i>Rafflesia kerrii</i> Mejer <sup>SN</sup>	Bua Phut	FL	heart tonic, hematinic, diuretic	IF	Chuakul 811/BK 20081 <sup>32</sup>
<b>RHIZOPHORACEAE</b>					
<i>Carallia brachiata</i> (Lour.) Merr. <sup>CT1</sup>	Chiang Phra Nang Ae	RT	antipyretic, to relieve paralysis	DC	Chuakul 902/BKF 96202 <sup>33</sup>
<b>RUBIACEAE</b>					
<i>Catunaregam tomentosa</i> (Blume&DC.) Tirveng. <sup>S</sup>	Khet	WD	diuretic, tendon tonic, analgesic	DC	Chuakul 852/BKF 25256 <sup>8,21</sup>
<i>Hedyotis corymbosa</i> (L.) Lam. <sup>S</sup>	Ya Lin Ngu	WP	antipyretic, treatment of appendicitis	DC	Chuakul 868/BK 11302 <sup>3,21</sup>
<i>Hydnophytum formicarum</i> Jack <sup>CT1</sup>	Hua Roi Ru	ST	antipruritic	DC (2)	Chuakul 817/BK 51089 <sup>21</sup>
<i>Mussaenda sanderiana</i> Roxb. <sup>S</sup>	Kaem Khao	RT	antipyretic	DC	Chuakul 903/BK 50239 <sup>15,21</sup>
<i>Oxyceros horridus</i> Lour. <sup>ST1</sup>	Khat Khao Khrua	RT, ST, LF, FL, FR	diuretic, hematinic in post-labour	DC	Chuakul 876/BK 58797 <sup>15,21</sup>

Table 1 Medicinal Plants Used in Khok Pho District, Pattani Province (Contd.)

Botanical Name	Thai name	Part(s) Used	Uses	Methods (Formulas)	Voucher/Authentic Specimen (References)
<b>RUTACEAE</b>					
<i>Glycosmis pentaphylla</i> (Retz.) DC. <sup>C</sup>	Khoei Tai	RT	antigonorrheal, hematinic in post-labour	DC(14)	Chuakul 863/BK 49185 <sup>8</sup>
<b>SAPINDACEAE</b>					
<i>Lepisanthes rubiginosa</i> (Roxb.) Leenh. <sup>ST3</sup>	Ma Huat	IF	treatment of common cold in children	LA	Chuakul 883/BKF 90805 <sup>34</sup>
<i>Nephelium hypoleuceum</i> Kurz <sup>S</sup>	Kho Laen	RT	for mouth cancer	LA	Chuakul 826/BKF 61204 <sup>34</sup>
<b>SCROPHULARIACEAE</b>					
<i>Scoparia dulcis</i> L. <sup>S</sup>	Krot Nam	WP	treatment of chronic gastrointestinal ailment of children characterized by marked malnutrition	DC	Chuakul 914/BKF33309 <sup>15,35</sup>
<b>TILIACEAE</b>					
<i>Microcos tomentosa</i> Smith <sup>C</sup>	Phlap phlaa	FL	to relieve herpes simplex, herpes zoster	PT(5), LA(10)	Chuakul 862/BKF 22980 <sup>36</sup>
<b>ULMACEAE</b>					
<i>Trema orientalis</i> (L.) Blume <sup>S</sup>	Phangrae Yai	RT	antipyretic	DC	Chuakul 829/BK 60735 <sup>8</sup>
<b>UMBELLIFERAE(APIACEAE)</b>					
<i>Hydrocotyle sibthorpioides</i> Lam. <sup>C</sup>	Ya Klet Hoi	WP	for mouth infection mouth cancer	DC(6)	Chuakul 939/BK 10687 <sup>37</sup>
<b>THYMELAEACEAE</b>					
<i>Linostoma persimile</i> Craib <sup>S</sup>	Mahakan	ST	fish poison	MC	Chuakul 844/BKF 47040 <sup>38</sup>

Table 1 Medicinal Plants Used in Khok Pho District, Pattani Province (Contd.)

Botanical Name	Thai name	Part(s) Used	Uses	Methods (Formulas)	Voucher/Authentic Specimen (References)
<b>VERBENACEAE</b>					
<i>Phyla nodiflora</i> (L.) Greene <sup>S</sup>	Ya Klet Pla	WP	treatment of insect bites	PT	Chuakul 886/BKF 42354 <sup>21</sup>
<b>VITACEAE</b>					
<i>Tetrastigma mutabile</i> (Blume) Planch. <sup>SN</sup>	A Ngun Pa	RT, ST	antihemorrhoid	DC	Chuakul 845/BK <sup>21</sup>
		FR	expectorant	CF	
<b>MONOCOTYLEDONS:</b>					
<b>ALLIACEAE</b>					
<i>Allium ascalonicum</i> L. <sup>C</sup>	Hom	BU	antipyretic	DC(3)	Chuakul 938 <sup>39</sup>
<b>AMARILLIDACEAE</b>					
<i>Curculigo orchidooides</i> Gaertn. <sup>S</sup>	Wan Phrao	RT	tonic	DC	Chuakul 907/BK 49109 <sup>39</sup>
<b>ARACEAE</b>					
<i>Cyrtosperma johnstonii</i> N.E.Br. <sup>C</sup>	Singha Mora	TB	aphrodisiac	AM (8)	Chuakul 942/BK 35432 <sup>3</sup>
<b>BROMELIACEAE</b>					
<i>Ananas comosus</i> (L.) Merr. <sup>CT3</sup>	Sapparot	RH	antigonorrheal, hematinic in post-labour	DC(14)	Chuakul 941 <sup>3</sup>
<b>CYPERACEAE</b>					
<i>Eleocharis ochrostachys</i> Steud. <sup>S</sup>	Chut Nu	WP	diuretic, antipyretic, bile tonic	DC	Chuakul 856/BK 27175 <sup>21,40</sup>

Table 1 Medicinal Plants Used in Khok Pho District, Pattani Province (Contd.)

Botanical Name	Thai name	Part(s) Used	Uses	Methods (Formulas)	Voucher/Authentic Specimen (References)
<b>FLAGELLARIACEAE</b>					
<i>Flagellaria indica</i> L. <sup>S</sup>	Wai Ling	RT	diuretic, oxytotic in post-labour	DC	Chuakul 877/BK 56645 <sup>41,42</sup>
<b>MARANIACEAE</b>					
<i>Schumannianthus dichotomus</i> Gagnep. <sup>C</sup>	Khlaa	RH	diuretic	DC (11)	Chuakul 887/BK 48090 <sup>43</sup>
<b>ORCHIDACEAE</b>					
<i>Vanilla ptilifera</i> Holtt. <sup>S</sup>	Saamroito Yai	FR	flavoring agent	AG	Chuakul 915/BKF 37102 <sup>21,44</sup>
<b>PALMAE (ARECACEAE)</b>					
<i>Areca catechu</i> L. <sup>C</sup>	Mak	SD	anti-inflammatory for oedema	LA (9)	Chuakul 940 <sup>15</sup>
<i>Borassus flabellifer</i> L. <sup>CT2</sup>	Tan	SD	to relieve herpes zoster	LA (10)	Chuakul 944/BK 24619 <sup>15</sup>
<i>Caryota mitis</i> Lour. <sup>ST2</sup>	Tao Rang Daeng	RT	antipyretic	DC (11)	Chuakul 911/BK 49007 <sup>15</sup>
<i>Cocos nucifera</i> L. <sup>C</sup>	Ma Phrao	FO	treatment of abnormal menstruation	DC	Chuakul 946/BKF 14092 <sup>15</sup>
<i>Oncosperma tigillarria</i> (Jack) Ridl. <sup>SN</sup>	Lao Cha On	KN	for ringworm and tinea versicolor	LA (12)	
		RT	for varicose vein	DC (13)	
		RT	antipyretic	DC (11)	
		RT, WD	diuretic	DC	Chuakul 860/BK 24664 <sup>21</sup>
		RT	antipyretic	DC	
<b>PANDANACEAE</b>					
<i>Pandanus odoratissimus</i> L. f. <sup>ST3</sup>	Toei Thale	YL	for kidney stone	CF	Chuakul 859/BKF 26256 <sup>3</sup>

Table 1 Medicinal Plants Used in Khok Pho District, Pattani Province (Contd.)

Botanical Name	Thai name	Part(s) Used	Uses	Methods (Formulas)	Voucher/Authentic Specimen (References)
<b>PHORMIACEAE</b>					
<i>Dianella ensifolia</i> (L.) DC. <sup>S</sup>	Ya Nu Ton	WP	to relieve to relieve paralysis	DC	Chuakul 865/BK 30857 <sup>8</sup>
<b>TACCACEAE</b>					
<i>Tacca integrifolia</i> Ker-Gawl. <sup>C</sup>	Wan Phangphon	TB	aphrodisiac	AM (8)	Chuakul 833/BKF 58374 <sup>45</sup>
<b>ZINGIBERACEAE</b>					
<i>Curcuma longa</i> L. <sup>CTI</sup>	Khamin	RH	antipruritic	DC (2)	Chuakul 819/BKF 90655 <sup>3,21,46</sup>
<i>Etilingera elatior</i> (Jack) R.M.Sm. <sup>S</sup>	Kala	RH	to relieve to relieve paralysis	DC	Chuakul 834/BKF 46651 <sup>21,46</sup>
<i>Etilingera littoralis</i> (Koen.) Gieseke <sup>S</sup>	Put Khang Khok	SD	carminative, stomachic, heart tonic	PD	Chuakul 909/BKF 19407 <sup>15,21,46</sup>
<i>Etilingera punicea</i> (Roxb.) R.M.Sm. <sup>S</sup>	Put Yai	SD	carminative, stomachic, heart tonic	PD	Chuakul 910/BK <sup>21,46</sup>
<i>Kaempferia galanga</i> L. <sup>C</sup>	Proh Hom	RH	antipyretic	DC (3)	Chuakul 825/BK 59948 <sup>3,21,46</sup>
<b>GYMNOSPERM:</b>					
<b>GNETACEAE</b>					
<i>Gnetum macrostachyum</i> Hook.f. <sup>CN</sup>	Muei Duk	ST	tendon tonic	DC (7, 15)	Chuakul 815/BK 53333 <sup>47</sup>
<b>FERN:</b>					
<b>PTERIDACEAE</b>					
<i>Acrostichum aureum</i> L. <sup>N</sup>	Prong Thale	RH	antipyretic	DC (11)	Chuakul 879/BK 29799 <sup>48</sup>

**Symbols:**

T1=Traditional Doctor Association., 1978a. Pramuan Sapphakhun Ya Thai (Part 1): Medicinal Plants, Medicinal Minerals and Medicinal Animals. Traditional Doctor Association, Wat Pho, Bangkok. pp. 5, 36, 42, 90-91, 99, 136-138, 155, 177-179,  
 T2=Traditional Doctor Association., 1978b. Pramuan Sapphakhun Ya Thai (Part 2): Medicinal Plants, Medicinal Minerals and Medicinal Animals,  
 T3=Traditional Doctor Association, Wat Pho, Bangkok. pp. 63-66, 70, 72-73, 171-172, 183, 185-186, 220. Traditional Doctor Association., 1978c. Pramuan Sapphakhun Ya Thai (Part 3): Medicinal Plants, Medicinal Minerals and Medicinal Animals. Traditional Doctor Association, Wat Pho, Bangkok. pp. 2-3, 45, 87, 96-97, 132-133, 135-136, 138, 167-168, 172, 204.

C=medicinal plants used in combinations,

S=medicinal plants used in single remedy,

N= newly identified medicinal plants

**Abbreviations:**

**Part(s) used:** AP=Aerial Part, BT=Bath, BU=Bulb, FB=Fruit bark, FL=Flower, FO=Fixed oil, LF=Leaf, LT=Latex, RH=Rhizome, RS=Red Sap, RT=Root, ST=Stem, TB=tuber, WD=Wood, WS=Watery Sap, YL=Young Leaf

**Methods:** AG=Aging and macerate in alcohol, AM=Alcoholic maceration, CF=Cook as food, DC=Decoction, EF=Eat freshly, EP=Expression, IF=Infusion, LA=Locally applied, ME=mix with calcium oxide, express juice and apply locally, MU=mix with fixed oil and use locally, PD=Powder, PT=Poultice

**Table 2** Distribution of the studied medicinal plants over the different families classification

Family	Number of medicinal plants
<b>DICOTYLEDONS:</b>	
LEGUMINOSAE	9
MIMOSOIDEAE (3)	
CAESALPINIOIDEAE (4)	
PAPILIONOIDEAE (2)	
EUPHORBIACEAE	8
RUBIACEAE	5
ASCLEPIADACEAE, LABIATAE,	3
ACANTHACEAE, APOCYNACEAE, COMPOSITAE,	2
DILLENIACEAE, MYRISTICACEAE, MYRTACEAE,	
SAPINDACEAE	
AIZOACEAE, AMARANTHACEAE, ANNONACEAE,	
APIACEAE, ARALIACEAE, AVICENNIACEAE,	
BOMBACACEAE, CELASTRACEAE,	
CONVOLVULACEAE, DIPTEROCARPACEAE, GUTTIFERAE,	
LAURACEAE, MALVACEAE, MELASTOMACEAE,	
MELIACEAE, MORACEAE, MYRSINACEAE, OLACACEAE,	
OPILIACEAE, GENTIACEAE, PIPERACEAE, AFFLESIIACEAE,	
RHIZOPHORACEAE, RUTACEAE, SCROPHULARIACEAE,	
THYMELAEACEAE, TILIACEAE, ULMACEAE,	
VERBENACEAE, VITACEAE	1
<b>MONOCOTYLEDONS:</b>	
PALMAE, ZINGIBERACEAE	5
ALLIACEAE, AMARALLIDACEAE, ARACEAE,	
BROMELIACEAE, CYPERACEAE, FLAGELLARIACEAE,	
MARANTACEAE, ORCHIDACEAE, PANDANACEAE,	1
PHORMIACEAE, TACCACEAE	
<b>GYMNOSPERM:</b>	
GNETACEAE	1
<b>FERN:</b>	
PTERIDACEAE	1

**Table 3** Number of medicinal plants used in each ethnomedicinal use

Ethnomedicinal use	Number of medicinal plants
Antipyretic	18
Diuretic	12
Hematinic	9
Tendon tonic	8
Heart tonic	5
Antihemorrhoid, carminative, for skin inflammation, expectorant, to relieve paralysis,	4
Antipruritic treatment of insect bites, for ringworm and tinea versicolor, treatment of herpes simplex or herpes zoster,	3
Anthelmintic, anti-inflammatory for oedema, aphrodisiac, for cough antigonorrheal, for mouth infection and mouth cancer,	2
oxytotic in post-labour, treatment of abnormal menstruation, stomachic Analgescic or to relieve body pain, for varicose vein, anticancer, antidiarrheal, antidysenteric, bile tonic, fish poison, flavoring agent, for abscesses, for kidney stone, for stomach ache, insecticide, laxative, longevity, treatment of appendicitis, treatment of chronic gastrointestinal ailment treatment of common cold, treatment of furred tongue with granular surface, treatment of yaws and oozing eczema due to lymphatic disorders	1



**Table 4** Formulas of medicinal plants used in Khok Pho District, Pattani Province

Formula	Use	Botanical name	Part used
1	treatment of skin inflammation	<i>Acacia concinna</i>	LF
		<i>Acanthus ebractertu</i>	AP
		<i>Pluchea indica</i>	WP
		<i>Tadehagi triquetrum</i>	LF
2	antipruritic	<i>Curcuma longa</i>	RH
		<i>Hydnophytum formicarum</i>	ST
		<i>Rhinacanthus nasutus</i>	AP
3	antipyretic	<i>Allium ascalonicum</i>	BU
		<i>Kaempferia galanga</i>	RH
		<i>Phyllanthus amarus</i> (or <i>P. urinaria</i> )	WP
4	hematinic	<i>Amaranthus spinosus</i>	WP
		<i>Caesalpinia sappan</i>	WD
		<i>Derris scandens</i>	ST
		<i>Senna siamea</i>	LF
5	treatment of herpes simplex, herpes zoster	<i>Antidesma ghaesembilla</i>	FL
		<i>Microcos tomentosa</i>	FL
		<i>Rauwenhoffia siamensis</i>	FL
6	treatment of mouth cancer, mouth infection	<i>Centipeda minima</i>	WP
		<i>Hydrocotyle sibthorpioides</i>	WP
		<i>Physalis minima</i>	WP
7	tendon tonic	<i>Cerbera odollam</i>	ST
		<i>Cryptolepis buchanani</i>	ST
		<i>Fagraea fragrans</i>	WD
		<i>Gnetum macrostachyum</i>	ST
8	aphrodisiac	<i>Cyrtosperma johnstoni</i>	TB
		<i>Tacca integrifolia</i>	TB
9	anti-inflammatory for oedema	<i>Areca catechu</i>	SD
		<i>Melaleuca cajuputi</i>	STBK
10	treatment of herpes zoster	<i>Areca catechu</i>	SD
		<i>Microcos tomentosa</i>	LF
		<i>Piper betle</i>	LF

**Table 4** Formulas of medicinal plants used in Khok Pho District, Pattani Province (contd.)

Formula	Use	Botanical name	Part used
11	antipyretic	<i>Acrostichum aureum</i>	RH
		<i>Borassus flabellifer</i>	RT
		<i>Cocos nucifera</i>	RT
		<i>Schumannianthus dichotomus</i>	RH
12	treatment of ringworm, tinea versicolor	<i>Artocarpus elasticus</i>	LF
		<i>Cocos nucifera</i>	FL
13	treatment of varicose vein	<i>Acacia concinna</i>	LF
		<i>Cocos nucifera</i>	KN
		<i>Clerodendrum inerme</i>	WP
14	antigonorrheal, hematinic in post-labour	<i>Ananas comosus</i>	RH
		<i>Glycosmis pentaphylla</i>	RT
15	tendon tonic	<i>Cryptolepis buchanani</i>	ST
		<i>Fagraea fragrans</i>	WD
		<i>Gnetum macrostachyum</i>	ST
		<i>Lepionurus sylvestris</i>	RT
16	treatment of mouth cancer	<i>Nephelium hypoleuceum</i>	RT
		Benzoin	

**Abbreviations:** AP=aerial part, BU=bulb, FL=flower, KN=kernel, LF=leaf, RH=rhizome, RT=root, SD=seed, ST=stem, STBK=stem bark, TB=tuber, WD=wood, WP=whole plant

**Table 5** Similarity between the use of medicinal plants in Thailand and other countries

Medicinal plants	Thailand		Other countries		
	Part(s)used	Use	Countries (references)	Part(s) used	Use
<i>Acanthus ebracteatus</i>	AP	treatment of skin inflammation	India (49)	LF	treatment of skin inflammation
<i>Ananas comosus</i>	RH	antigonorrheal	Malaysia (50)	UFJ	antigonorrheal
<i>Centipeda minima</i>	WP	treatment of mouth infection	Nepal (51)	WP	sinus infection
<i>Cocos nucifera</i>	RT	antipyretic	Indonesia (52)	RT	antipyretic
<i>Curcuma longa</i>	RH	antipruritic	Andaman Island (53)	FR	antipyretic
			India (54)	RH	anti-inflammatory agent in Ayurveda
<i>Hydrocotyle sibthorpioides</i>	WP	treatment of mouth cancer	China (55)	WP	treatment of hepatoma
<i>Leucas zeylanica</i>	LF+FL	antelmintic	Malaysia (56)	LF	vermifuge
<i>Pluchea indica</i>	RT	antipyretic	Hawaii (57)	LF	diaphoretic for fever
<i>Scoparia dulcis</i>	WP	treatment of chronic gastrointestinal ailment of children characterized by marked malnutrition	Mexico (58)	LF	treatment of stomach pain
<i>Phyla nodiflora</i>	WP	treatment of insect bites	Iran (59)	WP	to heal wounds
<i>Trema orientalis</i>	RT	antipyretic	Nigeria (60)	LF	antipyretic

**Abbreviations:** AP=aerial part; FL=flower; FR=fruit; LF=leaf; RH=rhizome; UFJ=unripe fruit juice; WP=whole plant

## CONCLUSIONS

Herbal remedies are generally used for the treatment of digestive, nervous, respiratory, renal and vascular problems. Medicinal plants are used frequently as antipyretic, diuretic, hematinic and tendon tonic. For herpes simplex, herpes zoster and skin inflammation, medicinal plants are most frequently used through external application. Twenty-nine species of medicinal plants reported possess the same ethnomedicinal uses as mentioned in Thai literature (T1, T2, and T3 in Table 1). In comparison with ethnomedicinal uses in ten countries; Andaman Island, China, Hawaii, India, Indonesia, Iran, Malaysia, Mexico, Nepal and Nigeria, it was found that eleven species of medicinal plants has the same or similar uses (Table 5).

Fourteen species are newly identified as medicinal plants: *Acrostichum aureum* L. (PTERIDACEAE), *Artocarpus elasticus* Reinw. ex Blume (MORACEAE), *Caesalpinia crista* L. [LEGUMINOSAE (FABACEAE)], *Gnetum macrostachyum* Hook. f. (GNETA-CEAE), *Hoya micrantha* Hook. f. (ASCLEPIADACEAE), *Lansium domesticum* Corrêa (MELIACEAE), *Leucas zeylanica* (L.) R.Br. ex Spreng [LABIATAE (LAMIACEAE)], *Oncosperma tigillaria* (Jack) Ridl. [PALMAE (ARECACEAE)], *Rafflesia kerrii* Meijer (RAFFLESIAEAE), *Rhodomyrtus tomentosa* (Aiton) Hassk. (MYRTACEAE), *Schefflera heterophylla* (Wall.&G.Don) Harms (ARALIA-CEAE), *Sesuvium portulacastrum* L. (AIZO-

ACEAE), *Tetrastigma mutabile* (Blume) Planch. (VITACEAE) and *Willughbeia edulis* Gaertn. (APOCYNACEAE) (marked as N in Table 1).

The floristic list composed during the survey is dominated by higher plants, with more than half of them belonging to large families: LEGUMINOSAE (FABACEAE), EUPHORBIAEAE and RUBIACEAE. Generally, the remedies of medicines are almost exclusively based on the utilization of a single plant (fifty-seven species).

It is hoped that the results here will contribute to our appreciation of the natural resources of Thailand and possibly to the discovery and subsequent development of valuable new drugs. In addition, further ethnobotanical research should be conducted in the Khok Pho District might lead to the discovery of other new and potentially valuable medicinal plants.

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