

**Ministry of Education  
Department of Higher Education  
Yangon University of Distance Education**

**Yangon University of  
Distance Education  
Research Journal**

Vol. 10, No. 1

December, 2019

**Ministry of Education  
Department of Higher Education  
Yangon University of Distance Education**

**Yangon University of  
Distance Education  
Research Journal**

Vol. 10, No. 1

December, 2019

Contents	Page
<b>Patriotic Pride from U Latt's Novel, "Sabae Bin"</b> <i>Kyu Kyu Thin</i>	1-4
<b>Creation of characters in Kantkaw a novel of Linkar Yi Kyaw</b> <i>Khin San Wint</i>	5-9
<b>Author Khin Khin Htoo's Creative Skill of Writing a Story " Ku Kuu"</b> <i>Kyin Thar Myint</i>	10-15
<b>A Stylistic Analysis of the poem "the road not taken" by Robert Frost</b> <i>Nyo Me Kyaw Swa</i>	16-22
<b>The Effectiveness of Critical Thinking on Students in Classroom</b> <i>Amy Thet</i>	22-26
<b>Making Education Accessible: an investigation of an integrated English teaching-learning system in first year online class at Yangon University of Distance Education</b> <i>Ei Shwe Cin Pyone</i>	26-33
<b>A Geographical Study on Spatial Distribution Pattern of Health Care Centres in Sanchaung Township</b> <i>Myo Myo Khine, Win Pa Pa Myo, Min Oo, Kaythi Soe</i>	33-39
<b>A Study of Crop-Climate Relationship in Hlegu Township</b> <i>Win Pa Pa Myo, Myo Myo Khine</i>	39-45
<b>How to Organize Data for Presentation</b> <i>Yee Yee Myint, Myint Myint Win</i>	46-50
<b>A Geographical Study on Open University in New Zealand</b> <i>Myint Myint Win, Yee Yee Myint</i>	50-54
<b>Royal Administrative Practices in Konbaung Period (1752-1885)</b> <i>Yin Yin Nwe</i>	54-60
<b>Pyidawtha Programme (1952-1960)</b> <i>Zaw Naing Myint</i>	60-69
<b>The Role of Saya San in Myanmar Politics (1930-1931)</b> <i>Hlaing Hlaing Nyunt</i>	70-76
<b>A Study of the Floral Arabesque Patterns in Myanmar Traditional Paintings</b> <i>Hla Hla Nwe</i>	76-81
<b>A Study on Job Stress of Office Staff from Yangon University of Distance Education</b> <i>Khin Ya Mone, Ma Aye, Theint Thiri Zan</i>	82-86
<b>A study on the job satisfaction of the teaching staff in Yangon University of Distance Education</b> <i>Theint Thiri Zan, Thiri Hlaing, Ma Aye</i>	86-91
<b>A study on the work motivation of the teaching staff in Yangon University of Distance Education</b> <i>Ma Aye, Khin Ya Mone, Theint Thiri Zan</i>	91-96
<b>A study of Aristotle's Golden mean</b> <i>Nwe Nwe Oo</i>	97-101
<b>A Study of Legal Thought of John Austin</b> <i>Aye Aye Cho</i>	102-109
<b>A study of the concept of "good will" in Kantian philosophy from the Myanmar philosophical thought</b> <i>Moe Aye Theint</i>	109-115
<b>The Term "Pāragū" in the Buddhist Scriptures</b> <i>Theingi Cho</i>	115-121
<b>Arāḍa's Teaching from the Buddhacarita</b> <i>Pa Pa Aung</i>	122-126
<b>The Merit of Donating Four Material Requisites</b> <i>Marlar Oo</i>	126-131
<b>The Benefits of Workers under the Workmen's Compensation Act in Myanmar</b> <i>Khin Mar Thein</i>	131-135

Contents	Page
<b>Study on the Humanitarian Intervention under International Law</b> <i>Nu Nu Win</i>	136-141
<b>A Study on the Quality of Fried Edible Oil (Palm Oil)</b> <i>Thazin Lwin, Myo Pa Pa Oo, Nyi Nyi</i>	142-148
<b>New Ceramer Coating Based on Titanium-resorcinol Copolymer with Blown Seed Oils</b> <i>Yu Yu Myo, Nwe Ni Win, Thazin Win</i>	149-156
<b>A Study on Antioxidant Activity of Edible Green Leaves of Brassica Juncea Linn. (Mom-Hnyin-Sein)</b> <i>Ohmar Ko, Thuzar Win, Hnin Yee Lwin</i>	156-161
<b>Microcontroller controlled four-digit timer</b> <i>Lei Lei Aung, Myo Nandar Mon, Khin Phyu Win, Moh Moh</i>	161-166
<b>Study On Current-Voltage Characteristics of Znte Electroplated Film Under Illumination</b> <i>Myo Nandar Mon, Thi Thi Win, Lei Lei Aung, Moh Moh</i>	166-172
<b>Effect of Heat Treatment on Optical Properties of Cd-doped ZnO Thin Film</b> <i>Su Thaw Tar Wint, Myo Myint Aung, Moh Moh</i>	173-175
<b>Radon concentration in soil samples from different layers of the underground of Bago University campus</b> <i>Thi Thi Win, Myo Nandar Mon, Aye Aye Khine, Moh Moh</i>	176-180
<b>A Study on Weakly Preopen and Weakly Preclosed Functions</b> <i>Kaythi Khine, Nang Moe Moe Sam, Su Mya Sandy</i>	181-187
<b>Functions and Their Graphical Representation</b> <i>Ohmar Myint, Moe Moe San, Zar Chi Saint Saint Aung</i>	187-193
<b>Trilinear and Quadrilinear Forms</b> <i>Wai Wai Tun, Aye Aye Maw</i>	193-198
<b>Prevalence and bionomics of <i>Aedes aegypti</i> (Linnaeus, 1762) larvae in high risk areas of Pazundaung Township, Yangon Region</b> <i>Tin Mar Yi Htun</i>	198-204
<b>Comparative study of helminthes parasitic eggs and larvae in goat from Magway Township</b> <i>Nilar Win, Myat Thandar Swe, Thinzar Wint</i>	205-213
<b>Endoparasites of anurans from north Dagon and Kamayut Townships</b> <i>Pa Pa Han, Thuzar Moe, Phyo Ma Ma Lin, Aye Aye Maw</i>	213-218
<b>Investigation of some invertebrates in Taungthaman Lake, Amarapura Township, Mandalay Division</b> <i>Khin Than Htwe, Kathy Myint, Thin Thin Swe, Aye Kyi</i>	219-225
<b>Antimicrobial activity of <i>Dolichandrone spathacea</i> (L.f.) k. Schum. Flowers</b> <i>Moet Moet Khine, Tin Tin Nwe, Win Win Shwe, Mya Mya Win</i>	226-231
<b>Five Selected Wild Medicinal Plants and Theirs' Uses</b> <i>Mya Mya Win, Moet Moet Khine, Win Win Shwe</i>	232-237
<b>The Comparison of the Yield from Non-Grafted and Grafted of Five Plants of Family Solanaceae</b> <i>Win Win Shwe, Moet Moet Khine, Mya Mya win</i>	238-244
<b>Silk Fabrics Factories in Amarapura</b> <i>Win Thida, Ni Ni Win, Yu Lae Khaing</i>	245-251
<b>A study on production of rubber in Myanmar (1996 - 97 to 2017- 2018)</b> <i>Tin Tin Mya, Ni Ni Win, Thinzar Aung</i>	251-257
<b>A Study on Factors Affecting the Exclusive Breastfeeding of Mothers in PYA-PON District</b> <i>Khin Mar Kyi, May Zin Tun</i>	258-265
<b>A Study on the Health Status and Physical Fitness of Elderly People at Home for the Aged (Hninzigone), Yangon</b> <i>Hein Latt, Pyae Phyo Kyaw</i>	266-273
<b>A Study on Mortality and Fertility levels of Myanmar and its Neighbouring Countries</b> <i>Ni Ni Win, Thinn Thinn Aung, Thinzar Aung</i>	273-280

## ANTIMICROBIAL ACTIVITY OF *DOLICHANDRONE SPATHACEA* (L.F.) K. SCHUM. FLOWERS

Moet Moet Khine<sup>1</sup>, Tin Tin Nwe<sup>2</sup>, Win Win Shwe<sup>3</sup>, Mya Mya Win<sup>4</sup>

### ABSTRACT

*Dolichandrone spathacea* (L.f.) K. Schum. belongs to the family Bignoniaceae. This plant was collected from Yenanchaung Township and identified with the help of available literature. The morphological characters of these plants were studied and described with the photographs. Preliminary photochemical investigation of flowers of this plant showed the presence of alkaloids,  $\alpha$ -amino acids, carbohydrates, starch, reducing sugars, glycosides, phenolic compounds, saponins, tannins and flavonoids. In addition, the flowers extracts were prepared by seven solvents such as pet ether, chloroform, methanol, acetone, ethylacetate, ethanol and distilled water. The extracts were tested with six types of microorganisms by using agar-well diffusion method *in vitro*. Petether, chloroform, methanol, acetone, ethylacetate and ethanol extracts showed antimicrobial activity. Distilled water extract showed effective *Bacillus subtilis*, *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Candida albican* except the *Bacillus pumilus* and *Escherichia coli*.

Keyword: Phytochemical Investigation and Antimicrobial activity

### INTRODUCTION

Myanmar is rich in various medicinal plants and people use different herbal medicine vastly as therapeutic agent – for various diseases. All plants produce chemical compounds which give them an evolutionary advantage. These phytochemicals have potential for use as drugs, and the content and known pharmacological activity of these substances in medicinal plants is the scientific basis for their use in modern medicine, if scientifically confirmed.(website - 1)

*Dolichandrone spathacea* (L.f.) K. Schum. belongs to the family Bignoniaceae. There are commonly known as Hingut, Thakhut, Thakhut-ma or mangrove trumpet tree (Kress *et.al*, 2003). It consists of about 112 genera and 725 species are mostly distributed in tropical and subtropical regions. Nine genera and nine species are found in Hong Kong. (Qi-ming & De-lin, 2009). About 116-120 genera and 650–750 species are mostly tropical and subtropical regions; 12 general and 35 species in china (Yun Zhang Z. & T. Santisuk, 1998). In Myanmar, this plant was found widespread (Hindley & Chit Ko Ko, 1987).

*Dolichandrone spathacea* (L.f.) K. Schum. is a common tree growing wild in river banks and mangroves of the leaves are used in antitumor, antiseptic and to treat oral thrush (as mouthwash), various diseases, flatulence and bronchitis in many countries of southeast Asia. The juice of the leaves is used against hepatic disorders, skin diseases, and allergies as detoxifier, anti-inflammatory and laxative. (website-2)

Each country has different uses of extracts of this plant such as treatment for bronchitis and snakebites in Trinidad and a cure for diabetes and hypertension in Guatemala. The tree is regularly used throughout the world by herbalists for treating respiratory disorders such as bronchitis, coughs, whooping cough, and pneumonia and diabetes. It has also been used for sores on the mouth and tongue. In Cuba, virtually every part of the plant is employed in herbal medicine. The latex is considered corrosive and astringent, and is used topically against warts, calluses, herpes (and other venereal diseases), and skin ulcers. The bark is used to reduce mucus; the roots for bile complaints; and the fruit is considered emollient soothing and softening the skin. (Website–3)

<sup>1</sup>Associate Professor, Dr, Department of Botany, Yangon University of Distance Education.

<sup>2</sup>Lecturer, Department of Botany, East Yangon University.

<sup>3</sup>Lecturer, Dr, Department of Botany, Yangon University of Distance Education.

<sup>4</sup>Lecturer, Department of Botany, Yangon University of Distance Education.

## MATERIALS AND METHODS

The specimens of *Dolichandrone spathacea* (L.f.) K. Schum. were collected from Yenanchaung Township in Magway Region during flowering and fruiting periods from June to July, 2018. The collected specimens were photographed to record and identified at the Botany Department, Yenanchaung Degree College, with the help of literatures of key to the family; Brandis, 1907; Backer, 1965; Dassanayake, 1981; Hundley & Chit Ko Ko, 1987 and Kress *et al.*, 2003; Qi-Ming & De-Lin, 2009. The flowers of *Dolichandrone spathacea* (L.f.) K. Schum. were dried in room temperature for four weeks and then pulverized by using grinding mill for further uses. In this research work, preliminary phytochemical of *Dolichandrone spathacea* (L.f.) K. Schum. flowers were tested at Botany Department, Yenanchaung Degree college and seven solvents extracts were tested against six pathogenic microorganisms by using agar well diffusion method of Cruichshank (1975) at pharmaceutical Research Department (PRD), Insein, Yangon.

## RESULTS

Scientific Name	- <i>Dolichandrone spathacea</i> (L.f.) Schum.
Myanmar Name	- Hingut, Thakhut, Thakhut-ma
Common Name	- Mangrove trumpet tree
Family	- Bignoniaceae.
Flowering period	- June to August.

### Taxonomic Description

Habits are moderate sized deciduous tree, bark greyish-brown. Leaves are opposite, compound leaf, imparipinnate, petiolate exstipulate. Leaflets are ovate to lanceolate, glabrous, entire. Inflorescences are terminal cluster racemes. Flowers are bracteate, bracteolate, pedicellate, complete, bisexual, irregular, zygomorphic, pentamerous, cyclic, hypogynous. Sepal is 5, synsepalous, valvate, spathaceous, sepaloid, inferior. Petals are (5), synpetalous, campanulate, trumpet-shaped, petaloid (white), inferior. Stamens 4, didynamous, petalostemonous, the filament, long, the anther ditheous, introrse, longitudinal dehiscence inferior. Carpel is (2), bicarpellary, syncarpous, bilocular, axile placentation, the style long and terminal, the stigma bifid, the disc annular, the ovary superior. Fruit are capsule, publish-brown. Seeds are flat and winged.



Figure 1. Habits



Figure 2. Inflorescence



Figure 3. Different sizes of flowers



Figure 4. Different sizes of buds



Figure 5. Petalostemonous of flower



Figure 6. TS of ovary

### Preliminary Phytochemical Investigation of the Powdered flowers of *Dolichandrone spathacea* (L.f.) K. Schum.

The results of these tests that confirmed the presence of flowers of *Dolichandrone spathacea* (L.f.) K. Schum. showed the presence of alkaloids,  $\alpha$ -amino acids, carbohydrates, starch, reducing sugars, glycosides, phenolic compounds, saponins, tannins and flavonoids. The results were shown in Table 1.

**Table 1. Preliminary Phytochemical Investigation of Powdered flowers of *Dolichandrone spathacea* (L.f.) K. Schum.**

No.	Tests	Extracts	Test Reagents	Observations	Results
					Leaves
1	Alkaloids	1% HCL	Dragendroff's reagent	White ppt.	+
			Mayer's reagent	White ppt.	+
2	$\alpha$ -amino acids	DW	Ninhydrin reagent	Pink spot	+
3	Carbohydrates	DW	10% $\alpha$ -naphthol and Conc: $H_2SO_4$	Red ring	+
4	Starch	DW	Iodine solution	Bluish black ppt.	+
5	Reducing sugars	DW	Benedicts solution	Brick Red ppt.	+
6	Glycosides	DW	10% lead acetate solution	Yellow ppt.	+
7	Phenolic compounds	DW	3% $FeCl_3$ solution	Yellow ppt.	+
8	Saponins	DW	Distilled water	Frothing	+
9	Tannins	DW	1% $FeCl_3$ solution	Greenish Brown ppt.	+
10	Flavonoids	95% EtOH	Mg/HCL	Pink	+

(+) Present (-) Absent

### Antimicrobial Activities from the flowers of *Dolichandrone spathacea* (L.f.) K. Schum.

Six microorganisms namely *Bacillus subtilis*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Bacillus pumilus*, *Candida albican*, and *E. coli* were subjected to test microbial activity. In this experiment, the extractives using pet-ether, chloroform, methanol, acetone, ethyl acetate and ethanol exhibits showed effectiveness. Distilled water extracts showed activities, *Bacillus subtilis*, *Staphylococcus aureus* and *Pseudomonas aeruginosa* and *Candida albican* except the *Bacillus pumilus* and *E. coli* as shown in Table 2 and Figures 8-13

**Table 2. Antimicrobial Activities from the flowers of *Dolichandrone spathacea* (L.f.) K. Schum.**

Date	Samples	Solvent	Organisms					
			<i>B. sub</i>	<i>S. aureus</i>	<i>P. aeruginosa</i>	<i>B. pumilus</i>	<i>C. albican</i>	<i>E.Coli</i>
25-9-2018	Flowers	pet-ether	12mm (+)	12mm (+)	12mm (+)	13mm (+)	12mm (+)	12mm (+)
		CHCL <sub>3</sub>	14mm (+)	15mm (++)	13mm (+)	16mm (++)	15mm (++)	16mm (++)
		MeoH	15mm (++)	13mm (+)	16mm (++)	13mm (+)	17mm (++)	17mm (++)
		Acetone	17mm (++)	17mm (++)	15mm (++)	16mm (++)	17mm (++)	17mm (++)
		EtoAc	20mm (+++)	18mm (++)	25mm (+++)	17mm (++)	18mm (++)	16mm (++)
		EtoH	14mm (+)	15mm (++)	16mm (++)	13mm (+)	14mm (+)	14mm (+)
		Water	12mm (+)	12mm (+)	12mm (+)	-	13mm (+)	-
	Control	pet-ether	-	-	-	-	-	-
		CHCL <sub>3</sub>	-	-	-	-	-	-
		MeoH	-	-	-	-	-	-
		Acetone	-	-	-	-	-	-
		EtoAc	-	-	-	-	-	-
		EtoH	-	-	-	-	-	-
		Water	-	-	-	-	-	-

Agar well – 10mm  
 10mm ~ 14mm (+)  
 15mm ~ 19mm (++)  
 20mm above (+++)

**\*Organisms\***  
 (1) *Bacillus subtilis* (N.C.T.C-8236)  
 (2) *Staphylococcus aureus* (N.C.P.C-6371)  
 (3) *Pseudomonas aeruginosa* (6749)  
 (4) *Bacillus pumilus* (N.C.I.B-8982)  
 (5) *Candida albican* (IFO-1060)  
 (6) *Escherchia coli* (N.C.I.B-8134)



Figure 8. *Bacillus subtilis*

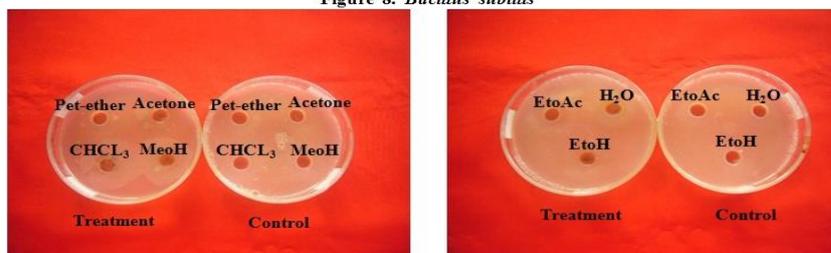
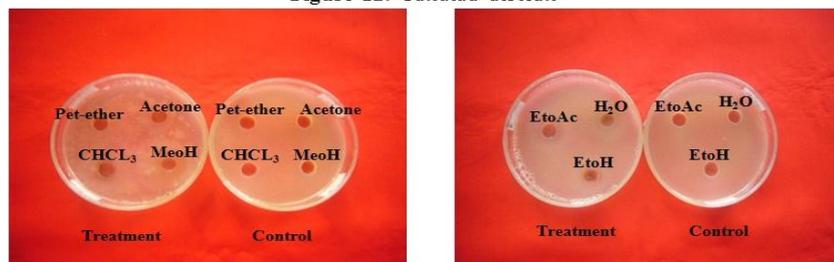


Figure 9. *Staphylococcus aureus*

Figure 10. *Pseudomonas aeruginosa*Figure 11. *Bacillus pumilus*Figure 12. *Candida albican*Figure 13. *Escherichia coli*

## DISCUSSION AND CONCLUSION

*Dolichandrone spathacea* (L.f.) K. Schum. belongs to the family Bignoniaceae. In the morphological study, *Dolichandrone spathacea* (L.f.) K. Schum. are trees; leaves are compound leaf, petiolate; leaflets are ovate to lanceolate, glabrous, entire; Inflorescence is terminal clustered racemes; flowers are trumpet - shaped, pedicellate and pentamerous; sepals are spathaceous; petals are petaloid (white), The stigma bifid; seeds are flat and winged. These characters are in agreement with those of Bandis, 1907; Backer, 1965; Dassanayake, 1981.

In this study preliminary photochemical investigation of *Dolichandrone spathacea* (L.f.) K. Schum. flower of showed the presence of alkaloid,  $\alpha$  - amino acid, carbohydrate, starch, reducing sugar, glycoside, phenolic compound, sapanins, tannins and flavonoid. According to website (3), *Dolichandrone spathacea* (L.f.) K. Schum. is rich in various photochemicals such as carbohydrates, alkaloids, glycosides, tannin, phenolic compound, flavonoid, terpenoids and saponins. Website (4) states that the plants are rich in various phytochemicals such as carbohydrates, alkaloids, glycosides, protein and aminoacids, tannin and phenolics, flavonoids, terpenoids, saponins, gum and mucilage, fixed oil and fat and phytosterols.

In this research, six microorganisms namely *Bacillus subtilis*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Bacillus pumilus*, *Candida albican*, and *E. coli* were subjected to

test microbial activity. The extractives using pet-ether, chloroform, methanol, acetone, ethyl acetate and ethanol exhibits showed effectiveness. Distilled water extracts showed activities *Bacillus subtilis*, *Staphylococcus aureus* and *Pseudomonas aeruginosa* and *Candida albican* except the *Bacillus pumilus* and *E. coli*. Website (5) mentions five new compounds, three iridoid glycosides and two triterpenoid saponins, along with thirty-two known compounds were isolated from the methanolic extract of *Dolichandrone spathacea* (L.f.) K. Schum. This traditional medicinal plant is widely used in Asia and India as antiseptic, for bronchitis and thrush treatment, and the methanolic extract has shown to possess microbial activity against methicillin resistant *Staphylococcus aureus*.

In the Philippines, poultice of fresh leaves and bark is applied against flatulence to women after childbirth. Seeds are powdered, and taken for nervous complaints. In Java, leaves are used for making mouthwash for thrush and also have a reputation as abortifacient. The bark is used as fish poison. Some reports that a decoction of bark in dogs have no ill effects. The flower is used to mouth infections, Hepatitis B,C (local use) and Antimicrobial activity. In a study of 52 traditionally used Thai medicinal plants, *Dolichandrone spathacea* was one of six plant species that showed effective DPPH radical scavenging activity and showed promising potential antioxidant activity. (Website - 2)

Thus it can be concluded that the flowers of *Dolichandrone spathacea* (L.f.) K. Schum. posses the medicinal values and health management of people. Therefore, it should be consumed as our daily diet need as vegetable, salad, soup and cooked.

#### ACKNOWLEDGEMENTS

We wish to express our thanks to Dr. Tin Mang Hla, Rector and Dr. Khin Thant Sin, Pro- Rector, Distance Education, Yangon for their kind permission to carry out this research. We also wish to express our heartfelt thanks to Dr. Nu Nu Swe, Professor (Head), Botany Department, Distance Education, Yangon, for her guidance, valuable advice and supporting for research work.

#### REFERENCES

- British Pharmacopoeia. 1968. **The Pharmaceutical Press**, London and Bradfod.
- Central Council for Research in Unani Medicine. 1987. **Phytochemical standards of Unani Formulations**. India: New Delhi.
- Cruichshank,R. 1975. **Medical Microbiology**, 12<sup>th</sup> ed., printed in Great Britain, Distributed in the USA by Longman Inc. New York
- Hundley, H.G and Chit Ko Ko. 1987. **List of Trees, Shrubs, Herbs and Principal Climbers etc.** 4<sup>th</sup>. Revised Edition by Hundley.
- Kress, W.J, R.A. DeFilipps, E. Farr and Daw Yin Yin Kyi. 2003. **A Checklist of the Trees, Shrubs, Herbs and Climbers of Myanmar**. Contributions from the United States National Herbarium. Volume 45:1-190.
- MarriniBettola, G.B., M. Nicolettic and M. Patamia. 1987. **Plant screening by Chemical Chromatographic Procedure under field conditions**. Journal of chromatogram.
- Qi-ming, H.U. and De-Lin, W.U.V. 2009. **Flora of Hong Kong. Vol. III**. Hong Kong Herbarium, Agriculture, Fisheries and Conservation Department.
- Trease, G.E. and W.C. Evans. 2002. **Pharmacognosy**. 15<sup>th</sup> Edition. London, New York.
- Yun Zhang Z. & T. Santisuk. 1998. **Flora of China. Vol. 18**. National Science Foundation, the starr Foundation, Foundation franklinia, and the Stanley Smith Horticultural Trust, U.S.

#### Website:

1. [www.medicinalplants.en.wikipedia.org](http://www.medicinalplants.en.wikipedia.org)
2. [www.thieme.connect.com](http://www.thieme.connect.com)
3. [www.scinapse.io](http://www.scinapse.io)
4. [www.worldwidejournal.com](http://www.worldwidejournal.com)
5. [www.healthybenefits.info](http://www.healthybenefits.info)

\*\*\*\*\*