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Morphology and Preliminary Phytochemical Studies on Some Medicinal Plants Found in Pyay Area

Thet Thet May

Abstract

A study on some medicinal plants grown in Pyay area have been undertaken. The outstanding feature of 5 collected species belonging to 5 genera of 5 families are identified and also briefly described. In this paper, preliminary phytochemical tests has been carried out by using plant parts. Outstanding characters, part used, and traditional uses of plants have been recorded and presented with photographs.

Introduction

Myanmar, which is a member of Asian countries, is well endowed with various rich resources.

Economically useful plants, and indigenous medicinal plants are some of the resources. The local pharmacists have traditionally used plants parts for the treatment of various diseases found in the country. However, there are still many plants required to be studied and apply scientifically.

Most of drug plants are found in tropics growing in wild condition. The medicinal value of the drug plants in due to the presence of specific chemical substances the produce a definite physiological action on the human body.

Health is the main important factor for man. Plants have been used as medicine and diet for many centuries. Therefore, the plant kingdom has always been supported on the most important roles for the survival of man.

Herbal medicine refers to the use of any plant's seeds, fruits, roots, leaves, barks or flowers for medicinal purposes. In long practiced outside of conventional medicine, herbalist is becoming more stream as up-to-date analysis and research show their value in the treatment and prevention of disease.

The Government of Myanmar has initiated a national programme for the development of Traditional Medicine System in combating six major types of diseases, namely malaria, tuberculosis, hypertension, diabetes, diarrhea and dysentery. It is the policy of the government to produce large

quantities of traditional medicine so as to decrease dependence on the important of foreign medicines.

Myanmar traditional medicines were formerly used in powdered form but nowadays, the Myanmar Pharmaceutical Industry has introduced it in the form of tablets, with makes dosage more accurate, and can be more conveniently stored and used.

In the present research, 5 species belonging to 5 genera of 5 families of cultivated and wild traditional plants grown in Pyay area were collected. The data an each plant includes full scientific name, family, local name, part used, brief description and traditional uses. This research reveal medicinal uses between peoples and plants grown in studies area.

Materials and Methods

Botanical Studies

Collection and identification of the five medicinal plants.

Plants growing as wild and cultivated in Pyay area. The collected samples were identified by using the standard method used in Department of Botany, Yangon University. Data information from the local people who are practicing folk medicine and some old aged local people having medicinal knowledge in my interview.

Chemical Studies

Preliminary phytochemical investigation of five selected medicinal plants.

Preliminary phytochemical investigation was carried out on the five selected medicinal. Plants to determine the presence or absence of alkaloids, glycosides, reducing sugars, phenolic compounds, flavonoids, saponins, α -amino acid, carbohydrates, tannins, steroids, cyanogenic glycosides and acid, base, neutral. The results were shown in Table (1).

(a) Test for glycosides

Two grams of the powdered material was boiled with 1% HCl for about 10minutes allowed to cool and filtered using a filter paper. The filtrate was divided into two portions and they were

tested with Mayer's reagent and Dragendroff's reagent. White, orange and yellow precipitates showed the presence of alkaloids.

(b) Test for glycosides

Two grams of the plant material was boiled with distilled water for about 10 minutes allowed to cool and filtered. The filtrate was treated with 10% lead acetate solution. Precipitation showed the presence of glycoside in plant material.

(c) Test for reducing sugar

Two grams of plant material was boiled with water for about 10 minutes allowed to cool and filtered. The filtrate was treated with Benedict's solution and then warmed in water-bath for a few minutes. The presence of reducing sugar was indicated by brick red precipitates.

(d) Test for phenolic compound

When crude sample was treated with FeCl_3 solution, it gave blue (or) green colour indicating the presence of phenolic compound.

(e) Test for flavonoids

About 5-10 drops of HCl was added into test tube containing small amount of crude sample, and then a small piece of magnesium was added pink (or) brown colour indicated the presence of flavonoids.

(f) Test for saponins

When crude sample was shaken with distilled water in a test tube, resulting forth (a persistent foam) indicated the present of saponin.

(g) Test for α -amino acid

Crude sample was dissolved in suitable solvent. It was spotted on filter paper with help of a micro pipette and allowed to dry. The filter paper was sprayed with Ninhydrin reagent and the paper was kept in over at 80°C for a few minutes. Purple spot shows the presence of α -amino acids.

(h) Test for carbohydrates

Three grams of sample powder was boiled with distilled water for about 20 minutes and filtered. The filtrate was placed into a test tube and few drops of 10% α -naphthol was added and shaken. Then, the test tube was inclined at an angle of 45°C and about 1 ml of concentrated sulphuric acid was added slowly along the side of the test tube. A red ring was formed between two layers showing the presence of carbohydrate.

(i) Test for tannins

Two grams of powdered plant material was extracted with old water as usual and filtered. The filtrate was treated with ferric chloride solution and gave deep-blue colour indicating the presence of tannin.

(j) Test for steroids

Crude sample was treated with 0.3 ml of acetic anhydride and mixed gently. Then, a few drops of concentrated sulphuric acid were added. Colour changing of the solution turned to green (or) grey within one hour, indicated the presence of steroids.

(k) Test for cyanogenic glycosides

Strip of filter paper was dipped in picric acid and allowed to dry and inserted with the cork in a test tube containing crude sample. Then it was gently heated by means of a spirit burner. No colour of sodium picrate paper showed the absence of cyanogenic glycosides.

(l) Test for acid/base compounds

Test tube containing crude sample was treated with bromocresol green indicator. And then shaken it in a few minutes and allowed to settle. Furnished yellow colour showed the presence of acidic compounds, blue colour showed in the presence of base compound and green colour showed the presence of neutral compounds in the plant material.

Results

Botanical Studies

1. Scientific Name - *Cassia fistula* L.
Family - Caesalpinaceae
Local Name - Ngu, Ngu-shwe-wa
Part Used - Fruits, root-barks, flowers, pods, leaves and roots.



Figure 1. Inflorescence of *Cassia fistula* L. (Ngu)

Outstanding Characters

Deciduous trees. Leaves alternate, unipinnately compound. Inflorescences terminal and axillary. Flowers yellow, hypogynous. Sepals 5, equal, free. Petals 1+4, free, the anterior petal largest. Stamens 10, free, 7 fertile, 3 sterile. Ovary oblongoid, curved, monocarpellary, unilocular with many ovules on the parietal placentae. Fruits legumens, indehiscent. Seeds endospermic. (Figure 1)

Traditional Uses

The fresh fruits were used in preparing purgative. The dried leaves of Ngu, Sin-do-ma-nwe and Oh-hne mixed equal parts and soaked in hot water used as plain tea for anti-diabetes.

Doses - 4-8 g fruit pulp.

2. Scientific Name - *Crataeva religiosa* R.Br
 Family - Capparidaceae (Capparaceae)
 Local Name - Kadet, Kon-kadet
 Part Used - Roots, barks, leaves, and flowers



Figure 2. Inflorescence of *Crataeva religiosa* R.Br. (Kadet)

Outstanding Characters

A deciduous tree, much branched. Leaves alternate, palmately compound. Inflorescences in dense terminal corymbs. Flowers greenish yellow, hypogynous. Calyx 4, free, deciduous. Corolla 4, free, with long claws. Stamens numerous, free; filament filiform, longer than petals, anther ditheous. Ovary ellipsoid, unilocular with many ovules on parietal placentae. Fruits a berry, fleshy. Seeds reniform, non-endosperm. (Figure 2)

Traditional Uses

The decoction of root-bark were reduced to one-fourth of the original remains amount and was used against anti-diabetes. The juice of leaves were mixed with honey and drunk for arthritis.

T.M.F. No. - 22, 75 (Main Drugs)

Doses - 15 - 25 g dry or root bark, extract (1:2) 1-10ml

3. Scientific Name - *Phyllanthus emblica* L.
 Family - Euphorbiaceae
 Local Name - Zee-phyu
 Part Used - Fruits, young shoots, seeds and leaves



Figure 3. Inflorescence of *Phyllanthus emblica* L. (Zee phyu)

Outstanding Characters

A middle size trees, deciduous; branches spreading; bark light gray. Leaves alternate, bipinnately compound. Inflorescences axillary cymes at the axile of leaflets, male flowers at the base and female flowers at the apex. Flowers greenish-yellow, minute, unisexual, monoecious. Sepals 6, oblong-obovate, pale green. Stamen 3, filaments fused into the column. Ovary globose, trilocular, with two ovules* in each locule on axile placentae. Fruits globoid, drupe. Seeds trigonous, light green in colour.(Figure 3)

Traditional Uses

“Triphala” of zee-byu, phan-kha and thit-seint is very useful in traditional medicine. The fresh fruits are eaten to be long life span. An infusion of the seeds is given as a drink in fever and anti-diabetes.

T.M.F No. - 22, 36 (Main Drugs)

Doses - Eat as fruit or fruit juice, 2-8g fruits.

4. Scientific Name - *Streblus asper* Lour.

Family - Moraceae

Local Name - Oh-hne

Part Used - Leaves, root-barks, barks, latex



Figure 4. Inflorescence of *Streblus asper* Lour. (Oh-hne)

Outstanding Characters

A small evergreen tree, milky white latex; light grey or greenish rough bark. Leaves alternate, simple. Inflorescences axillary raceme. Flowers unisexual, dioecious; male flowers in small, head globose, yellowish green; female flowers solitary or 2-4 together. Stamens 4, inflexed in bud. Ovary inferior, unilocular with one ovule in each locule on pendulous placentae; stigma bifid. Fruits drup globose. Seeds globose, smooth, greenish white. (Figure 4)

Traditional Uses

The dried leaves of *Cassia fistula* (Ngu), *Tinospora cordifolia* (Sin-down-ma-nwe) and *Streblus asper* (Oh-hne) where mixed equal parts and soak in hot water used as plain tea were used for diabetes. The leaves juice of *Streblus asper* Lour. also were good for anti-diabetes.

Doses - 1.5 - 2 g powdered root.

5. Scientific Name - *Terminalia chebula* Retz.

Family - Combretaceae

Local Name - Phan-Kha

Part Used - Fruits



Figure 5. Inflorescence of *Terminalia chebula* Retz. (Phan-kha)

Outstanding Characters

A deciduous tree, younger stem glabrescent, woody. Leaves opposite to subopposite, simple. Inflorescences terminal and axillary; paniculate spikes. Flowers creamish white, epigynous. Calyx 5-lobed, fused, campanulate, pale yellow. Corolla absent. Stamens 10 free, in 2 whorls; filaments equal in length; anther dithecal. Ovary ovoid, monocarpellary, unilocular with 1-2 ovules on pendulous placentae. Fruits a drupe. Seeds solitary, ellipsoid 5 ribbed, non-endospermic. (Figure 5)

Traditional Uses

The tender green fruits were eaten as salad. The powdered dried fruits were mixed with coconut oil and applied over the wounds in burn. The crushed fruits were immersed under water the whole night the resulting liquid were used as ophthalmic solution. The decoction of the barks were good for the curing of dysentery and to improve bowels movements.

T.M.F No. - 27, 30. (Main Drugs)

Doses - 3 - 9 g/day, 1.5 - 6 g powdered bark; 56-112m decoction.

Chemical Studies

Table (1) Comparative study of preliminary phytochemical investigation of five medicinal plants

No	Constituent	Reagent Used	Observation	Remark				
				Sample				
				1	2	3	4	5
1	Alkaloids	1. Mayer's reagent 2. Dragendroff's reagent	White ppt. Orange ppt	+	+	-	+	-
2	Glycosides	10% lead acetate Solution	White ppt.	+	+	+	+	+
3	Reducing sugar	Benedict's solution	Brick red ppt.	+	+	+	+	+
4	Phenolic Compound	10% Ferric chloridesolution	Green blue colour	+	-	+	-	+
5	Flavonoids	Dil. HCl and Mg	Pink colour	+	+	+	+	+
6	Saponins	Distilled water	Frothing	+	+	+	+	+
7	α -Amino acid	Ninhydrin reagent	Purple spot	+	-	+	-	+
8	Carbohydrat-es	10% naphthol	Red ring	+	+	+	+	+
9	Tannins	10% Ferric chloridesolution	Deep-blue colour	+	-	+	-	+
10	Steroids	Acetic anhydride and H ₂ SO ₄ Cons:	Green colour	+	+	+	+	+
11	Cyanogenic glycoside	Sodium picrate Paper	Brick red colour	-	-	-	-	-
12	Acid/base/neutral	Bromocresol green	Green colour	N	B	A	B	A

Five Medicinal Plants.

1 = *Cassia fistula* L. (Barks)

2 = *Crataeva religiosa* R.Br. (Roots)

3 = *Phyllanthus emblica* L. (Fruits)

4 = *Streblus asper* Lour. (Root barks)

5 = *Terminalia chebula* Retz. (Fruits)

+ = Present

- = Absent

A = Acid

B = Base

N = Neutral

Table (2) T.M.F No. 75 (Patawi Dat Kyeik Hsay Gyi)
Ingredients: Plant Origin

No	Name of Ingredient				Weight		
	Myanmar Name	Scientific Name	Family	Part Used	Myanmar		Metric
					Kyat	Pe	
1	OK-shit	<i>Aegle marmelos</i> Corr.	Rutaceae	Root	20.0	-	320.0
2	Say-pa-le	<i>Gentiana kurroo</i> Royle.	Gentianaceae	Root	20.0	-	320.0
3	*K on-kadet	<i>Crataeva religiosa</i> R.Br.	Capparidaceae	Root	20.0	-	320.0
4	Na-nwin	<i>Curcuma longa</i> L.	Zingiberaceae	Rhizome	20.0	-	320.0

Ingredients: Chemical Origin

No	Myanmar Name	Name of Ingredient	Weight		
			Myanmar		Metric
		Scientific Name/ Other name	Kyat	Pe	G
1	Htonn Chauk	Calcium carbonate	20.0	-	320.0

Dosage : Take a dose of 2gm of powder three times a day for seven day.

Table (3) Daw Myint San's Anti-diabetes Drugs
Ingredients: Plant Origin

No	Name of Ingredient				Weight		
	Myanmar Name	Scientific Name	Family	Part Used	Myanmar		Metric
					Kyat	Pe	
1	*OK-hne	<i>Streblus asper</i> Lour.	Moraceae	Root	5.0	-	80.0
2	*N gu	<i>Cassia fistula</i> L.	Caesalpin- iaceae	Bark	5.0	-	80.0
3	Sindon-ma- nwe	<i>Tinospora cordifolia</i> Mier.	Menisper- maceae	Stem	5.0	-	80.0
4	Na-nwinkha	<i>Curcuma zedouria</i> Rose.	Zingibera- ceae	Rhiz- ome	15.0	-	24.0

Dosage : It should be taken for an adult to take 2gm of powder.

Table (4) U Than Tun's Anti-diabetes Drugs.
Ingredients: Plant Origin

No	Name of Ingredient				Weight		
	Myanmar Name	Scientific Name	Family	Part Used	Myanmar		Metric g
					Kyat	Pe	
1	Zadeik-hpo	<i>Myristica fragrans</i> Houtt.	Myristicaceae	Dried fruit	5.0	-	80.0
2	Zadeik-hpo	<i>Myristica fragrans</i> Houtt.	Myristicaceae	Flowers	5.0	-	80.0
3	Pae-lay-nyin (or) Myanmar kukkaya	<i>Acemlla mauritanica</i> Rich.	Asteraceae	Roots	5.0	-	80.0
4	*Zee-phyu	<i>Phyllanthus emblica</i> L.	Euphorbiaceae	Dried fruit	5.0	-	80.0
5	*Phan-kha	<i>Terminalia chebula</i> Retz.	Combretaceae	Dried fruit	5.0	-	80.0
6	Na-nwin-kha	<i>Curcuma zedoaria</i> Rose.	Zingiberaceae	Rhizome	15.0	-	160.0

Ingredients: Chemical Origin

No	Myanmar Name	Name of Ingredient	Weight		
			Myanmar		Metric g
		Scientific Name/ Other name	Kyat	Pe	
1	Hsay-dan	Yellow orpiment, Yellow arsenic/ Sulphide, $AS_2.S_3$	2.0	8.0	32.8

Dosage : Take one teaspoon powder at one time warm water two times a day for ten day

Discussion and Conclusion

An ancient times, man studied the available plants and materials, particularly as source of food and distinguished between poisonous and no poisonous plant. While several thousand plants have been used for medicinal purpose, comparatively few of them are cultivated. Therefore, medicinal plants growing wild in various parts of the world, from the source of supply of most of the drug.

In traditional medicine, there are many methods of preparation procedure to cure diarrhoea, dysentery, anti-diabetes, anti-inflammatory etc. usually herbal drug have be prepared from mixing of different species.

In the present study, 5 species of plants from 5 families were presented and described mainly traditional medicinal uses.

In this study, phytochemical tests of *Cassia fistula* L. (barks), *Crataeva religiosa* R.Br. (roots), *Phyllanthus emblica* L. (fruits), *Streblus asper* Lour, (root-barks) and *Terminalia chebula* Retz. (fruits) were performed in order to find out the presence or absence of different types of organic constituents.

Thus natural plants constituents have been interested in the role of therapy and pharmacology because of the bioactive property.

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References

- Aung Naing, U (1998). *Myanmar Traditional Medicine*, Manual for Health Basic Training Course.
- Ashin-na-ga-thein (1973). *Illustrated Dictionary of Medicinal Plants*, Vol - I-IV, Mangalar Press, Yangon.
- Chopra. R.N, Nayar S.L & Chopra I.C (1956). *Glossary of Indian Medicinal Plants*. Council of scientific and Industrial Research, New Delhi
- Hooker, J.D (1964). *Flora of British India*, Vol I . Rove & C, Ltd. Kent, London.
- Hundlay, H.G and Chit Ko Ko (1961). *List of Trees, shrubs, Herbs and Principal climber of Burma*. Supt. Govt- Printing and Staly, Rangoon.
- Kirtikar, R.L & Basu B.D (1933). *Indian Medicinal Plants*. Vol - I-IV. Published by Latit Mohan Basu, M.B. 49, Leader Road, Allahabod, India.
- Pharmacology Research Division (1989). *Myanmar Traditional Medicine Formulatory*, Department of Medical Research, Yangon, Myanmar.
- Trease, G.E and Evans, W.C. (1975). *A Text Book Pharmacognosy*, Baslliere, Tindall. 11th Edition London.