

MORPHO-HISTOCHEMICAL STUDIES OF COMMONLY USED MEDICINAL PLANTS IN BUKIDNON

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ABSTRACT

This survey on the extent of herbal healing in the province of Bukidnon conducted from May 29, 1986 to January 17, 1987 shows that folk healing with herbal medicine is prevalent. Based on their availability, 20 species were described morphologically and identified, namely: Mangga (*Mangifera indica* L.); Kapayas (*Carica papaya* L.); Gabon [*Blumea balsamifera* (L.) D.C.]; Hilbas (*Artemisia vulgaris* L.); Mansanilya (*Chrysanthemum indicum* L.); Anghelika [*Bryophyllum pinnatum* (Lam.) Kurz]; Busikad (*Cyperus kyllingia* Rott); Tubatuba (*Jatropha curcas* L.); Kogon (*Imperata cylindrica* L.); Tanglad (*Andropogon citratus* D.C.); Mayana (*Coleus blumei* Benth.); Hierba buena (*Mentha cordifolia* Opiz); Abukado (*Persea americana* Mill); Gumamela (*Hibiscus rosasinensis* L.); Bayabas (*Psidium guajava* L.); Kamunggay (*Moringa oleifera* Lam.); Pandan (*Pandanus odoratissimus* L.f.); Buyo (*Piper betle* L.); Sinaw-sinaw (*Peperomia pellucida* L.) and Luy-a (*Zingiber officinale* Rosc.).

Histochemical tests were likewise made from the different organs of the plants to determine the presence and localization of active principles in the plant tissues.

Histochemical findings revealed that the active constituents present in the commonly used medicinal plants were alkaloids, tannin, oxalic acid, formic acid, fats and oils, amygdalin, saponin, arbutin and tartaric acid. These active principles were localized in the epidermis, cortex, vascular bundles and mesophyll of the plant tissues.

The presence of the active constituents was recorded as: 0 = absent; 1 = rare; 2 = abundant; and 3 = very abundant.

INTRODUCTION

Herbal healing in Bukidnon, as learned from the author's personal interviews with the herbolarios, is sometimes strongly associated with superstition. The herbolarios do not have a knowledge of the presence and identity of active principles in plants which are valuable to therapy, as learned from the studies of de Padua et al. (1980) and Gonzales (1981). This is the context in which this study was undertaken.

It is hoped that this work will serve as a potent instrument in disseminating the scientific basis of how plants heal body ailments. Furthermore, it is hoped that this study will help promote the use of herbal medicine and eventually improve the health and economic conditions of the people, especially the poor in the rural areas.

Objectives of the Study

1. To survey, collect, propagate, identify and describe morphologically the commonly used medicinal plants in the province of Bukidnon; and
2. To establish the scientific basis for the medicinal uses of plants by determining the active constituents and their localization within the plant body through histochemical tests

Significance and Limitation of the Study

This study primarily aims to promote the utilization of the common medicinal plants used by herbolarios in some municipalities of Bukidnon and to help establish the scientific basis for the use of these plants. Results of this study might help alleviate health problems, especially among the poor.

Since various surveys on the use of medicinal plants and researches on active principles have been conducted by experts of leading agencies, like the National Science and Technology Authority (NSTA) and the University of the Philippines Los Baños, this study focused on proving the efficacy and acceptability of herbal healing in the province of Bukidnon.

Since it was not possible to conduct a survey of the 22 municipalities of Bukidnon, especially the remote areas or barrios, due to unavailability of transportation and safety considerations, the researcher covered only five towns and six barrios.

MATERIALS AND METHODS

Interviews of herbolarios in several municipalities of Bukidnon were made from May 29, 1986 to January 24, 1987. Data, such as name, age and number of herbolarios interviewed in the municipalities covered, were collected.

The herbolarios were interviewed using guidelines which covered complete information on the uses of medicinal plants. Informal discussions held with herbolarios and data from scientific journals, books and handbooks were used for an assessment of the status of the effectiveness and economic value of medicinal plants of Bukidnon. Likewise, data from periodicals, dictionaries, theses, manuscripts and radio programs were collected.

The medicinal plants commonly used by the herbolarios were: *Coleus blumei* Benth; *Psidium guajava* L.; *Persea americana* Mill.; *Piper betle* L.; *Blumea balsamifera* (L.) D.C.; *Bryophyllum pinnatum* (Lam) Kurz; *Mentha cordifolia* Opiz; *Artemesia vulgaris* L.; *Moringa oleifera* Lam.; *Imperata cylindrica* L.; *Zingiber officinale* (Rosc.); *Chrysanthemum indicum* L.; *Pandanus odoratissimus* L.f.; *Peperomia pellucida* L.; *Andropogon citratus* D.C.; *Jatropha curcas* L., *Carica papaya* L., *Cyperus kyllingia* Rotto, *Hibiscus rosasinensis* L.; and *Mangifera indica* L. Most of these were gathered and planted by the researcher in her residence in Maramag, Bukidnon.

The abundance and availability of these plants in each municipality were the bases of selecting the 20 species of medicinal plants used in this study. Morphological descriptions were made with the use of ruler and meterstick. Photographs of the habitat of the plants were taken.

Free-hand technique was employed on freshly collected young leaves and stems for histochemical tests. Slightly thick sections and the application of minimal appropriate chemical reagents were ideal for the tests.

Photomicrographs were done from suitable specimens which showed the distribution of constituents within the tissues of the plant body. The presence of these constituents was recorded as: 0 = absent; 1 = rare; 2 = abundant; 3 = very abundant.

RESULTS AND DISCUSSION

Histochemical findings showed the presence and the amount of the active constituents which varied in the different tissues of the plant organs (Table 1).

From the foregoing tests, the alkaloids were found to be abundant, followed by oxalic acid, tannin, formic acid, fats and oils, amygdalin, saponin, arbutin and tartaric acid. The alkaloids were the active constituent most common in all species.

The curative values of these medicinal plants for various body ailments were allied and related to one another. In other words, they were associated with the active principles present in each. The findings were similar to the results of the research studies of Quisumbing, Bacalso (1980), Rodrigucz (1983), Angeles (1984, Siytango and Ladion (1985), de Padua et al. (1985) and Ticzon and Baguio 1986.

Herbs have medicinal values. Therefore, they may be as effective or even better than drugs manufactured synthetically, with less side effects or toxic effects on the body.

SUMMARY, CONCLUSION, RECOMMENDATIONS

Morphological descriptions were made and histochemical tests were conducted on 20 species of commonly used plants chosen from among 87 reported medicinal plants.

Studies on plant morphology serve as valuable tools in taxonomic work. Likewise, knowledge of ecological distributions explains variations in the form and structure of plants.

A plant may be considered medicinal if it contains active principles like alkaloids, tannins, oxalic acid, formic acid, fats and oils, amygdalin, saponin and arbutin. Histochemical tests allow one to determine the presence, amount and localization of these constituents in plant tissues.

Knowledge of histochemical analysis in plants is still limited, especially among rural folks and herbalarios. The province of Bukidnon is known for its many medicinal plants and folk medicinal practices.

The following recommendations are put forward to help promote the use of medicinal plants:

1. That massive use and wider acceptance of herbal medicine be carried out through the concerted efforts of researchers, public health personnel, media men, policymakers, school teachers, hilot, herbalarios and household members;
2. That more intensive research and experiments be conducted subjecting other parts of the plant (i.e., roots, flowers, fruits and seeds) to histochemical tests; and
3. That government agencies, like the Department of Science and Technology (DOST), National Research Council of the Philippines (NRCP), Department of Health (DOH), World Health Organization (WHO), Philippine Council for Health Research and Development (PCHRD) and chemical companies, invest in herbal medicine research and development.

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Table 1. Active constituents and their localization in some commonly used medicinal plants

Species	Plant Part	ACTIVE PRINCIPLES								Medicinal Values	
		Alkaloid	Tannin	Sap- nin	For- mic Acid	Oxa- lic Acid	Tar- taric Acid	Arbu- tin	Amyg- dalin		Fats & Oils
1. <i>Mangife- ra indica</i> L.	Leaf	vb=2	ll=1	M=1	-	-	-	-	-	ule=1	Anti-inflam- matory; Analgesic
2. <i>Curica papaya</i> L.	leaf	ule=1 ll=1	-	-	-	m=2	-	-	-	ue=1 M=1	Anti-in- flammato- ry; laxa- tive; Analgesic
3. <i>Blumea balsami- fera</i> (L.) D.C.	Leaf	e=2 m=2 vb=2 t=2	en=1 m=1 vb=1	-	-	en=1 m=1 vb=2	-	-	-	-	Diuretic antispas- modic; Analgesic
4. <i>Artemesia vulgaris</i> L.	Stem	-	c=2 vb=1	-	-	c=2 vb=2	-	-	vb=2	e=1 en=1	Analgesic anti-inflam- matory; anti-spas- modic; bacteri- cidal
	Leaf	e=1 vb=2	c=1 vb=1	-	-	m=1 vb=2	-	-	e=1 vb=2	e=1 en=1	
5. <i>Chrysan- themum indicum</i> L.	Stem	-	c=1	-	-	e=1 c=3 vb=1	-	-	en=1	e=1	Anti-fla- tulence; anti spas- modic; bacteri- cidal; hypoten- sive
	Leaf	e=1 m=1 vb=2	m=1	-	-	ule=3 m=2 vb=2 t=2	-	-	-	-	
		-	-	-	-	-	-	-	-	-	
6. <i>Bryophyl- lum pinnatum</i> L.	Leaf	en=1 m=1 vb=2	en=1 m=2 vb=2	-	M=1	e=2 en=2 m=2	-	-	-	UE=1 le=2 vb=1	Analgesic; anti- inflamma- tory; bac- tericidal

7.	<i>Cyperus kyllingia</i> Rotto	Leaf	-	-	-	-	-	-	-	-	-	Anti- pyretic; analgesic; anti-in- flamma- tory	
		Stem	vb=2	vb=1	-	-	-	-	-	-	-		-
8.	<i>Jatropha curcas</i> L.	Stem	e=1	-	-	p=1	c=2	-	-	c=1	-	Anti-in- flamma- tory; Anal- gesic; An- ti-rheu- matic; an- ti-flatu- lencec; anti- diarrheal	
			c=1	-	-	-	vb=1	-	-	-	-		
			vb=1	-	-	-	p=1	-	-	-	-		
		p=2	-	-	-	-	-	-	-	-	-		
		Leaf	e=1	-	-	le=2	le=1	-	-	-	-		-
			m=2	-	-	len=2	m=2	-	-	-	-		-
-	-		-	m=2	-	-	-	-	-	-			
9.	<i>Imperata citratus</i> D.C.	Rhi- zome	vb=2	-	-	e=2	-	-	-	-	e=2	Anti-py- retic; analge- sic; anti- tussive	
			Par=1	-	-	Par=3	-	-	-	-	Par=2		
		tra=2	-	-	vb=2	-	-	-	-	-			
		-	-	-	-	-	-	-	-	-			
10.	<i>Andro- pogon citratus</i> D.C.	Rhi- zome	vb=2	-	-	e=2	-	-	-	-	e=2	Anti-py- retic; anal- gesic; antispas- modic; hypoten- sive; an- xiolytic	
			Par=1	-	-	Par=3	-	-	-	-	Par=2		
		tra=2	-	-	vb=2	-	-	-	-	-			
		-	-	-	-	-	-	-	-	-			
11.	<i>Coleus blumei</i> Benth	Leaf	v=1	m=1	-	-	vb=1	-	M=1	-	-	Anti-in- flamma- tory; bacte- rio-static property	
			vb=1	vb=1	-	-	-	-	-	-	-		
		m=1	-	-	-	-	-	-	-	-			
12.	<i>Mentha cordi- folia</i> Opiz	Stem	P=1	c=1	-	-	-	-	-	-	c=1	Anti-in- flmma- tory; diure- tic; anti- rheumatic	
			c=1	-	-	-	-	-	-	-	-		P=1
		vb=1	-	-	-	-	-	-	-	-	e=1		
		Leaf	ue=1	-	-	-	-	-	-	-	m=1		
13.	<i>Persea ameri- cana</i> Mill	Stem	e=1	en=1	vb=2	e=2	e=1	-	-	e=1	-	Anti-dia- rrheal; analgesic; anti-rheu- matic; astringent	
			c=1	e=2	-	c=1	vb=2	-	-	-	-		
			-	c=1	-	vb=3	c=1	-	-	-	-		
		-	vb=1	-	p=1	-	-	-	-	-			
		Leaf	Le=2	m=1	e=1	e=2	-	-	-	-	e=1		
			vb=2	vb=1	vb=2	c=1	-	-	-	-	-		
M=2	-		P=1	vb=2	-	-	-	-	-				

14. <i>Hibiscus rosasinensis</i> L.	Leaf	ue=1	M=1	-	-	M=1	-	-	-	-	Anti-inflammatory; antiseptic
		vb=1	ll=1	-	-	ll-1	-	-	-	-	
		M=1	-	-	-	-	-	-	-	-	
		ll=1	-	-	-	-	-	-	-	-	
15. <i>Psidium guajava</i> L.	Stem	-	e=1	-	-	e=1	-	-	-	-	Anti-diarrheal; analgesic; anti-inflammatory;
		-	c=2	-	-	c=2	-	-	-	-	astrin-
		-	vb=1	-	-	vb=3	-	-	-	-	gent;
		-	-	-	-	-	-	-	-	-	antiseptic
	Leaf	e=2	e=1	-	-	M=2	-	-	-	e=1	flamma-
		M=2	m=3	-	-	vb=1	-	-	-	-	tory;
		vb=1	vb=2	-	-	-	-	-	-	-	astrin-
		-	-	-	-	-	-	-	-	-	gent;
		-	-	-	-	-	-	-	-	-	antiseptic
		-	-	-	-	-	-	-	-	-	
16. <i>Moringa oleifera</i> Lam.	Leaf	ule=1	M=1	-	-	-	-	-	-	e=1	Anti-inflammatory; astrin-
		vb=1	-	-	-	-	-	-	-	M=1	gent;
		-	-	-	-	-	-	-	-	-	analgesic
		-	-	-	-	-	-	-	-	-	
17. <i>Pandanus odoratus</i> L.	Leaf	vb=2	vb=1	-	-	-	-	-	-	le=1	Anti-inflammatory; anti-
		-	Par=1	-	-	-	-	-	-	-	vertigo;
		-	-	-	-	-	-	-	-	-	hypoten-
		-	-	-	-	-	-	-	-	-	sive; anti-
		-	-	-	-	-	-	-	-	-	diabetic
18. <i>Piper betle</i> L.	Leaf	e=1	M=1	-	M=2	M=1	-	-	-	-	Antitussive; analgesic;
		vb=1	-	-	vb=1	-	-	-	-	-	anti-inflammatory;
		-	-	-	-	-	-	-	-	-	antiseptic
		-	-	-	-	-	-	-	-	-	
19. <i>Peperomia pellucida</i> L.	Stem	e=1	en=1	-	-	-	-	-	-	-	Analgesic; anti-inflammatory;
		vb=1	c=1	-	-	-	-	-	-	-	antiseptic;
		c=1	-	-	-	-	-	-	-	-	astrin-
		-	-	-	-	-	-	-	-	-	gent
	Leaf	ule=1	M=1	-	M=1	-	-	-	-	-	
20. <i>Zingiber officinale</i> Rosc.	Rhizome	Par=1	Par=1	Par=1	-	Par=2	-	-	-	-	Antiseptic; laxative; antitussive; anti-inflammatory; antispasmodic

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