



Chapter I

Introduction

The genus *Ageratum* belongs to the Tribe Eupatorieae of the family Compositae (Bailey, 1973). These plants are widely distributed in all tropical countries (Kirtikar & Basu, 1975). According to the Index Kewensis and its supplements, this genus consists of 76 species (Brenan, 1981; Durand & Jackson, 1960; Hill, 1926; Hill, 1929; Hill, 1933; Hill, 1938; Hooker & Jackson, 1893; Prain, 1908; Prain, 1913; Prain, 1921; Salisbury, 1941-1950; Taylor, 1959; Taylor, 1970; Thiselton-Dyer, 1904). *Ageratum conyzoides* Linn. (Billy Goat Weed) is only one species so far reported to be found in Thailand (Smitinand, 1980). The plant is distributed over agricultural fields, waste places, grassy fields, road sides and sugarcane-plantations.

Local names of *Ageratum conyzoides* Linn. are listed as follows:

- Tapsuea lek, "ต๋ับเสื่อเล็ก" (Sing Buri)
 - Thiam mae haang, "เทียมแม่ช้าง" (Loei)
 - Saap raeng saap kaa, "สาบแร้งสาบกา" (Chiang Mai)
 - Yaa saap haeng, "หญ้าสาบแข็ง" (Chiang Mai)
 - Yaa saap raeng, "หญ้าสาบแร้ง" (Ratchaburi)
- (Smitinand, 1980)

Kirtikar and Basu (1975) described *Ageratum conyzoides* Linn. as:-

"annual, erect herbs or undershrubs, 30-90 cm high; branched, terete, more or less hairy. Leaves opposite or the upper alternate, 5-5.7 cm by 2.5-5 cm., broadly ovate, subacute, crenate and with ciliate margins, more or less hairy on both sides, base cuneate; petioles 2.5-3.2 cm long, hairy. Flowering head small, in dense terminal corymbs; flowers pale blue or white, malodourous. Involucral bracts linear, very acute, ribbed on the back, ciliolate and with scarious margins. Pappus of 5 scales, aristate, dilated at the base, serrulate, about equalling the corolla. Achenes 2-2.5 mm long, sharply angled, sometimes glandular, attenuated at the base, black." (Figure 1)

This plant was reported to be consumed for the medicinal purposes in many countries and its medicinal properties were listed in Table 1.

Table 1. Medicinal Properties of *Ageratum conyzoides* Linn.

Geological area	Part used	Indication	Preparation and Administration	Reference
Taiwan. The Philippines and Indonesia	leaf	as an effective vulnerary on cuts, wounds, sores, boils, abscesses, animal bites, contusions, swellings and itch for flatulence in children	pounded with lime or oil or alone, applied hot to cold rubbed on abdomen	Perry, 1980 Fox, 1953
Taiwan		for gonorrhoea and cure tetanus infection in newborn infants	infusion	Perry, 1980
The Philippines	entire plant	to correct stomach trouble	decoction	Guerrero, 1921
Indonesia	entire plant	for matrix cancer and stomach cancer in human adult	mixed with <i>Eclipta alba</i> Hassk., <i>Spilanthes acmella</i> Murr., <i>Vernonia cinerea</i> Less <i>Jatropha curcas</i> Linn. , infusion taken after meals in the morning and evening	Hsu, 1967
Sumatra	entire plant	for fever in human adult	decoction	Bartlett, 1927
Malay peninsula	leaf	for fever for dysentery	decoction mixed with the leaf of <i>Melastoma malabathricum</i> L. and <i>Hedyotis capitellata</i> Wall.	Bartlett, 1927 Burkill & Haniff, 1930
	entire plant	for high fever, dysentery and prevent the birth of a quick succession of children	decoction	Burkill & Haniff, 1930

Table 1. Cont.

Geological area	Part used	Indication	Preparation and Administration	Reference
India	leaf	applied to wounds and cuts for quick healing as a haemostatic in human adult	juice of fresh leaves, used internally	Bedi, 1978; Rao and Jamir, 1982
	leaf and stem	for boils, leprosy and wounds in human adult	juice applied externally	Kasturi, Thomas and Abraham, 1973
	entire plant	for fever, as a tonic, for rheumatism and for diarrhoea in human adult	infusion taken orally	Watt and Breyer-Brandwijk, 1962
Madagascar	leaf and stem	as a fomentative in skin disease, more particularly leprosy	as a bath	Kirtikar and Basu, 1975
	leaf	applied on boils, applied to a wound to prevent tetanus	as a poultice	Kirtikar and Basu, 1975
	root	for purulent ophthalmia	cold decoction	Kirtikar and Basu, 1975
Zair		for sleeping sickness in human adult	infusion taken orally	Dalziel, 1948
		for uterine problem in human adult	infusion taken orally	Dalziel, 1948
Mexico	entire plant	for fever, as a tonic, for rheumatism and for diarrhoea in human adult	infusion taken orally	Watt and Breyer-Brandwijk, 1962

Table 1. Cont.

Geological area	Part used	Indication	Preparation and Administration	Reference
Ivory Coast	entire plant	oxytocic in human (pregnant)	infusion taken orally	Bouquet and Debray, 1974
Togoland	entire plant	for fever		Kirtikar and Basu, 1975
Trinidad	leaf	abortifacient in human	infusion taken orally	Wong, 1976
		for menstrual pains in human adult	squeezed juice, add honey and olive oil, and taken internally	Simpson, 1962
Guatemala	leaf	for intestinal worms in human adult	infusion taken orally	Logan, 1973
Costa Rica	entire plant	as an emmenagogue in human adult	infusion taken orally	Morton, 1977
Brazil	leaf	as a emetic in human adult	infusion taken orally	Purohit, 1962
		a remedy for prolapse ani in human adult	leaf juice, rectal application	Purohit, 1962
	entire plant	for flatulent colic and as a tonic in diarrhoea in human adult	infusion taken orally	Purohit, 1962
		as a remedy for metrorrhagia in human adult	infusion taken orally	Purohit, 1962

The biological activities of this plant were listed in Table 2.

Table 2. Biological Activities of *Ageratum conyzoides* Linn.

Geological area	Organic part	Biological activity	Condition	Effective on	Solvent	Dose	Activity	Reference
Nigeria	leaf	antibacterial activity	<i>in vitro</i>	<i>Staphylococcus aureus</i> Rosenbach.	petroleum ether	conc. not stated	active	Durodola, 1977
India	dried leaf	plant germination inhibition		<i>Amaranthus spinosus</i> Linn.	CHCl ₃	conc. not stated	weak activity	Rizvi, Mukerji & Mathur, 1980
	entire plant	antitumor activity	<i>in vivo</i>	mouse (Leuk-LIZIO)IP	EtOH:H ₂ O (1:1)	dose not stated	inactive	Bhakuni, Dhar, Dhwan & Mehrotra, 1969
		antitumor activity	<i>in vivo</i>	rat Sarcoma-WM 256(IM), IP	EtOH:H ₂ O (1:1) ²	dose not stated	inactive	Bhakuni <i>et al.</i> , 1969
		cytotoxic activity	<i>in vitro</i>	cell culture (CA-9KB)	EtOH:H ₂ O (1:1) ²	ED ₅₀ 20.0 (g/ml)	inactive	Bhakuni <i>et al.</i> , 1969
		toxicity assessment	<i>in vivo</i>	mouse (both sexes) IP	EtOH:H ₂ O (1:1) ²	LD ₅₀ 1.0 (g/kg)		Bhakuni <i>et al.</i> , 1969
	dried entire plant	insecticidal activity	<i>in vitro</i>	<i>Musca domestica</i> Linn.	EtOH:H ₂ O (1:1)	conc. used 1.0%	active	Atal, Srivastava, Wali, Chakravarty, Dhawan & Rastogi, 1978
		insecticidal activity	<i>in vitro</i>	<i>Tribolium castaneum</i> Herbst	EtOH:H ₂ O (1:1)	Conc. used 1.0%	active	Atal <i>et al.</i> , 1978

Table 2. Cont.

Geological area	Organic part	Biological activity	Condition	Effective on	Solvent	Dose	Activity	Reference
	aerial part	toxic effect	<i>in vivo</i>	Ewe, in ration		dose not stated	active***	Purohit, 1962
		death	<i>in vivo</i>	Ewe, in ration		dose not stated	active****	Purohit, 1962
	dried seed	plant germination inhibition		<i>Amaranthus spinosus</i> Linn.	CHCl ₃	conc. not stated	22.6% inhibition	Rizviet al., 1980

* ED50 is median effective dose.

** LD50 is median lethal dose.

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**** 1

out of 20 animals had severe colic pains, dilated pupils, distressed breathing. Also difficult in standing and swing gait.

out of 20 animals died, few cysts in peritoneum on autopsy. Abomasum, duodenum, caecum and small intestine were highly congested; blood and

slimy fluid in previous structures; intestines had caseated nodules of oesophagostomum; wall of rumen had a few amphistomes. Kidneys congested,

bladder empty, gall bladder full of bile.

Preliminary phytochemical screening of *Ageratum conyzoides* Linn. showed positive result for coumarins and flavonoids. Previous studies of this plant indicated the present of simple coumarin (Wehmer, 1929) and 5'-methoxynobiletin (Adesogan and Okunade, 1978). It is the purpose of this investigation to study the nature of coumarin and flavonoids in *Ageratum conyzoides* Linn. native to Thailand. The result would provide information for the country's own natural resource in term of chemical constituents.

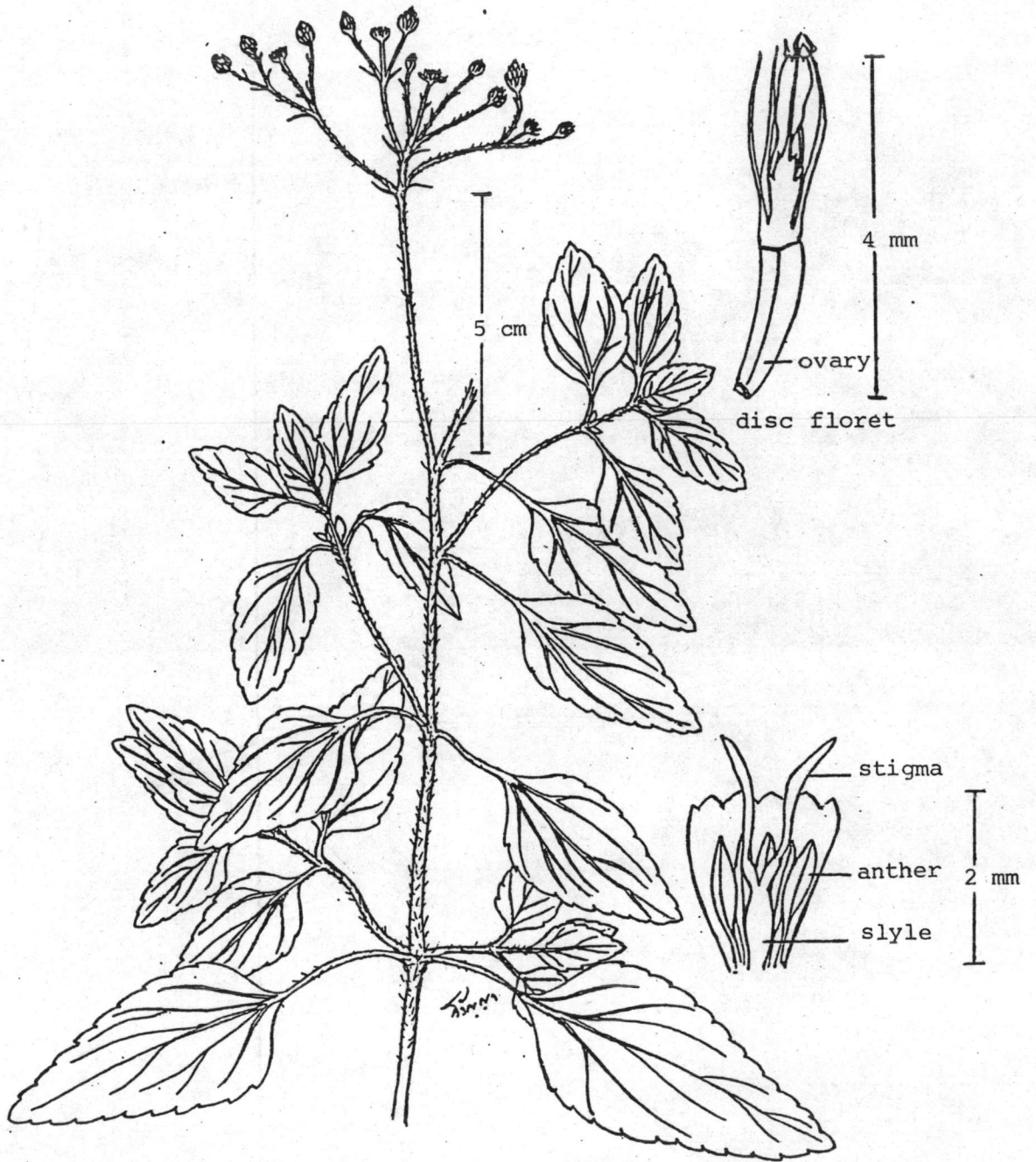


Figure 1 สายแรงสาบตา *Ageratum conyzoides* Linn., Compositae