

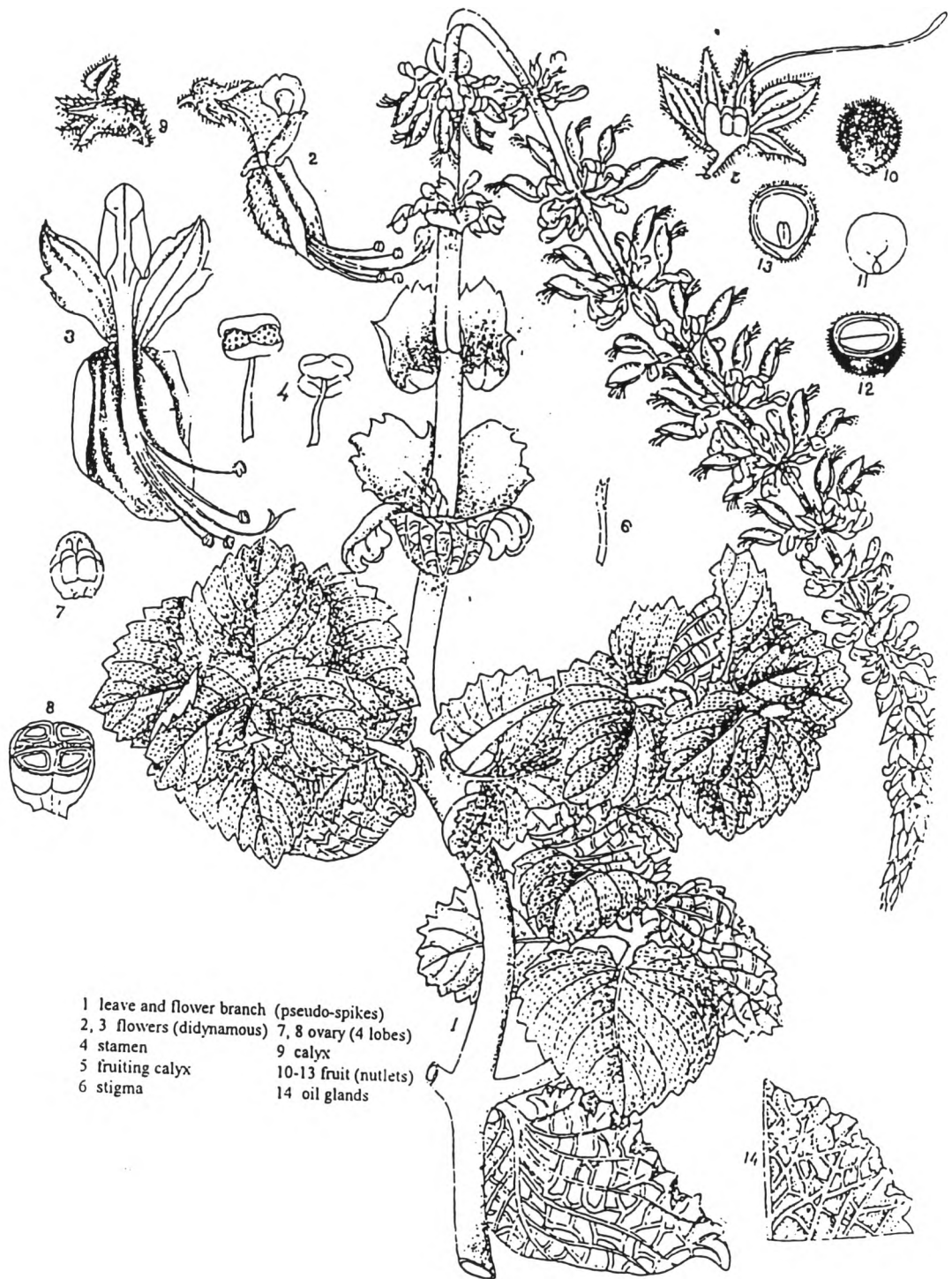
## CHAPTER I

### INTRODUCTION



*Coleus amboinicus* Lour. (Country borage or Indian borage) (Figure 1) is an attractive, perennial subshrub trailing or erect and reaching nearly a meter in height. Believed to be native to the Moluccas, this plant was long ago introduced into many areas of the Old World tropics and some of the Pacific islands and, because of its aromatic leaves, often used as a substitute for borage or thyme. It has also been cultivated in the Far East for its essential oil. Before the end of the 19<sup>th</sup> century the plant was scattered about the Caribbean and, sparsely, from northern Venezuela to Yucatan, adopted in these areas more as a folk-remedy than as a flavoring herb. Only in recent years has country borage been given moderate attention as a culinary species in the Bahamas and Florida (Morton, 1992).

Country borage is one of the most attractive and most aromatic members of the mint family, Labiales (Lamiaceae). The plant is of special interest to taxonomists because of the pseudo spicate inflorescence that does not fit into either *Coleus* or the closely related genus *Plectranthus* (Blake, 1971). Still the plant is considered a species of *Coleus* and must be accepted as *Coleus amboinicus* Lour. (Synonym : *Coleus aromaticus* Benth., *Coleus carnosus* Hassk., *Coleus crassifolius* Benth., *Coleus suganda* Blanco, *Plectranthus aromaticus* (Benth.) Roxb., *Plectranthus amboinicus* (Laurert) Spreng). In Thailand this plant is called “huu suea” (หฺูเสื่อ) or “niam huu suea” (เนียมหฺูเสื่อ) while in the northern part of the country it is called “hom duan luang” (หอมด่วนหลวง) or “hom duan huu suea” (หอมด่วนหฺูเสื่อ) (Smitinand, 1980).



- 1 leaf and flower branch (pseudo-spikes)  
 2, 3 flowers (didynamous) 7, 8 ovary (4 lobes)  
 4 stamen 9 calyx  
 5 fruiting calyx 10-13 fruit (nutlets)  
 6 stigma 14 oil glands

Figure 1. *Coleus amboinicus* Lour.

(Roxburgh, 1874)

Blake (1971) stated that *Coleus amboinicus* is quite different from all species of the genus *Coleus* and from all species of *Plectranthus* in its scarcely declinate fruiting calyx, having a long, broad, uppermost lobe with 4 short, very narrow lower lobes, stamens with the filaments united to beyond the middle into a long tube split on the upperside, and compact cymes.

Roxburgh (1874) described the characteristic features of *Coleus amboinicus* as a perennial, semi-woody, erect or sprawling and spreading subshrub with weak, thick, pale-green, nearly cylindrical or bluntly 4-sided stems and branches that are densely pubescent when young. The plant normally attains 60 to 90 cm in height. The plant self-multiplies by rooting at the lower nodes. Short- to long-petioled (2-3.2 cm) leaves are opposite, 5-10 cm in length and equally wide, broadly ovate, fleshy, crisp, fragile, pale to dark green in color, slightly pubescent on the upper surface and hairy on the veins beneath. Some individual hairs are tipped with globular, transparent shining oil glands. The tiny, funnel-form, 5-lobed, pink, lavender or blue flowers are born in dense whorls on terminal, interrupted pseudo-spikes, 10 to 30 cm long. Seeds (nutlets) are flattened-globular and light brown.

Country borage is utilized in homeopathic medicine in India. Primarily, the plant material acts as a carminative, relieving indigestion, dyspepsia, gas pains, and bronchitis (Brown,1946), but it is also given to children with colic (Drury, 1873). A decoction of one handful of leaves per bottle of water was formerly drunk after meals to prevent indigestion and stomach ache (Roxburgh, 1874). The leaf decoction is also drunk after childbirth (Burkill, 1966).

In Caribbean area, the leaf juice mixed with sugar is regarded as a powerful aromatic carminative employed in dyspepsia and even given to children to relieve coughs. A leaf infusion, decoction, or syrup may be given in cases of epilepsy,

convulsions, asthma, bronchitis, chronic coughs, sore throat, and congestive heart failure (Burkill, 1966).

In India, country borage is prescribed in urinary diseases and vaginal discharges (Chopra *et al.*, 1958). People in Coro, Venezuela, rely on the leaves not only to improve digestion but to relieve kidney troubles especially for expelling of kidney stones (Morton, 1974).

Among its external uses, a lotion made from the leaves is employed as a massage against fever (Brown, 1946). Leaves are laid on the temples to dispel headache (Quisumbing, 1951). In India, the juice is rubbed around the eyes to alleviate the pain of conjunctivitis (Nicholson, 1991). In Malaysia, bruised leaves are applied to burns (Quisumbing, 1951) and are poulticed on centipede and scorpion bites (Burkill, 1966). In Java, it is used to treat cracks at the corners of the mouth (Burkill, 1966).

A common custom in Malaysia is to rub the leaves on the hair and body after bathing for the scent. The leaves are also mixed with rice flour as an offering to the spirits when a house is being built (Burkill, 1966).

Table 1 provides ethnomedical information on *Coleus* species. Presently, several species of this genus have been studied for their chemical constituents and biological activities. The starting point for many investigations is the use of plants in traditional medicine, leading to search for their active principles. In several cases the isolated compounds were shown to be terpenoids, some of which are very active. This phytochemical study of *Coleus amboinicus* was conducted in order to study its chemical constituents, compare with those found within this genus and search for compounds which might exhibit therapeutic values.

Table 1. Ethnomedical information on *Coleus* species

Plant Names	Part uses	Uses	Reference
<i>Coleus amboinicus</i>	Aerial Parts (East Asia)	treatment of asthma, chronic coughs, epilepsy and other convulsive affections	Asprey and Thornton, 1955
	Baked Leaf (India)	fever and digestive complaints of children	John, 1984
	Fresh Leaf Juice (Thailand)	asthma	Panthong, Kanjanapothi and Taylor, 1986
<i>Coleus atropurpureus</i>	Aerial Parts (Malaysia)	regulate menstruation and prevent conception	Burkill, 1966
	Leaf (Indonesia)	emmenagogue	Van Steenis-Kruseman, 1953
	Part Not Specified (Indonesia)	promote menses and used as an abortifacient	Couvee, 1952
<i>Coleus barbatus</i>	Dried Leaf (Brazil)	digestive disturbances	Van den Berg, 1984
	Dried Leaf (East Africa)	measles and used as a bath	Hedberg <i>et al.</i> , 1983
	Dried Leaf (Tanzania)	swelling on the face, coughs, tonsillitis and rheumatism	Hedberg <i>et al.</i> , 1983
	Fresh Leaf Juice (East Africa)	purgative and stomach aches	Hedberg <i>et al.</i> , 1983

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Table 1. Ethnomedical information on *Coleus* species (Continued)

Plant Names	Part uses	Uses	Reference
<i>Coleus kilimandschari</i>	Dried Root (Tanzania)	stomach pains, speed delayed delivery and infertility	Hedberg <i>et al.</i> , 1983
	Dried Entire Plant (Taiwan)	liver disease	Yanfg <i>et al.</i> , 1987
	Leaf (Philippines)	headache, healing bruises, wounds, boils, ophthalmia and dyspepsia	Garcia <i>et al.</i> , 1973
	Dried Fruit (Rwanda)	bronchitis	Boily and Van Puyvelde, 1986
	Dried Leaf (Kenya)	constipation	Johns, Kokwaro and Kimanani, 1990
<i>Coleus scutellarioides</i>	Dried Leaf (Rwanda)	syphilis	Boily and Van Puyvelde, 1986
	Flower and Leaf (Papua-New Guinea)	fever and pains	Holdsworth, 1989
	Leaf (Indonesia)	emmenagogue	Van Steenis-Kruseman, 1953
<i>Coleus vettiveroides</i>	Fresh Leaf Juice (Papua-New Guinea)	induce sterility and severe coughs	Holdsworth, 1984
	Dried Entire Plant (Tibet)	chronic bloody diarrhea with abdominal pain	Lama and Santra, 1979
<i>Coleus zeylanicus</i>	Dried Entire Plant (India)	diarrhea	Mehrotra, Vishwakarma and Thakur, 1989