

# TRADITIONAL VETERINARY MEDICINE FOR SMALL RUMINANTS IN JAVA



Edited by:  
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and Tri Budhi Murdiati

INDONESIAN SMALL RUMINANT NETWORK  
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# **TRADITIONAL VETERINARY MEDICINE FOR SMALL RUMINANTS IN JAVA**

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**Bogor, 1991**  
**Indonesian Small Ruminant Network**

## FOREWORD

*The expense and unavailability of modern drugs and veterinary care mean that livestock holders in developing countries often depend on traditional methods to treat sick animals. In Indonesia too, farmers have their own, locally available remedies and treatments for livestock diseases. In contrast to human ethnomedicine, however, little has been published on Indonesian traditional veterinary medicine.*

*The Indonesian Research Institute for Animal Production (RIAP) in collaboration with the Small Ruminant-Collaborative Research Support Program (SR-CRSP) recognized the importance and potential contribution of traditional veterinary medicine in Indonesia. They organized a series of surveys of such practices relevant to sheep and goats in West, Central and East Java. These surveys covered a number of villages. They included interviews with livestock holders, correspondence with factories making traditional medicines, and the collection of published and unpublished materials from universities and research institutions. The surveys were conducted by scientists from RIAP (Ciawi, Bogor), the Sub Research Institute for Animal Production at Klepu (Central Java), the Sub Research Institute for Animal Production at Grati (East Java), the Research Institute for Animal Disease (RIAD), and the Research and Development Centre for Biology of the Indonesian Institute of Sciences (LIPI), both in Bogor.*

*The findings from the surveys were reported at a workshop organized by the Indonesian Small Ruminant Network (ISRN) in May 1990. This workshop proceedings volume focuses on small ruminants. However, in view of the similarities in the animals' digestive systems, we have included also remedies used for large ruminants. We have also retained information on other domestic animals we regarded as possibly relevant to small ruminants and their health status.*

*The chapters in this volume discuss characteristics of traditional veterinary practices in Java, describe prescriptions from different regions, and list some 90 medicinal plants and their applications in*

*livestock. Findings from field research are supplemented with a compilation of references on traditional veterinary medicine and laboratory studies on medicinal plants.*

*We hope the proceedings will be useful to scientists and development professionals and serve as a the starting point for future research on traditional veterinary medicine and the efficacy of medicinal plants for livestock diseases.*

*Evelyn Mathias-Mundy  
Tri Budhi Murdiati*

# ETHNOBOTANICAL ASPECTS OF MEDICINAL PLANTS FOR RUMINANTS IN JAVA

Harini Sangat-Roemantyo and Soedarsono Riswan

## Introduction

In rural areas in Java, medicinal plants play an important role in the prevention and treatment of diseases of domestic animals. People have used the remedies for a long time and believe in their efficacy (Sangat-Roemantyo and Riswan, 1989). They cultivate medicinal plants in their homegardens and often continue to use them even if commercial drugs are available.

Rising costs of commercial drugs have stimulated the interest in traditional remedies as alternatives to expensive medicines for animal health care. However, little has been published about which plants people use to treat their livestock. This paper draws on publications by Backer and van den Brink (1963-1968), Burkhill (1935), Departemen Kesehatan (1981) and Kalangile (1981), as well as our own field experience. It lists medicinal plants used to treat ruminants in Java and discusses their ethnobotanical characteristics, preparation and application.

## Plant Species Used in Animal Health Care

Farmers in Java use at least 23 plant species belonging to 15 families to treat their ruminants (Table 1). Members of the ginger family (Zingiberaceae) were the most frequently used species. They included kunci (*Boesenbergia pandurata*), kunyit "turmeric" (*Curcuma domestica*), temu giring (*Curcuma heyneana*), temu lawak (*Curcuma xanthorrhiza*), jahe "ginger" (*Zingiber officinale*), and lempuyang (*Zingiber zerumbet*). These species are usually planted in homegardens or on land nearby. They are common ingredients in cooking and are stored as dried rhizomes in many kitchens. They are therefore readily available needs treatment.

Other medicinal plants are cash crops such as bawang merah "shallot" (*Allium cepa*), bawang putih "garlic" (*Allium sativum*), beras "rice" (*Oryza sativa*), and tembakau "tobacco" (*Nicotiana tabacum*); cultivated fruits such as nanas "pineapple" (*Ananas comosus*), papaya (*Carica papaya*), labu merah (*Cucurbita moschata*),

jambu biji “guava” (*Psidium guajava*), and sawo (*Manilkara kauki*); vegetables such as paria (*Momordica charantia*); and ornamental plants and wayside trees such as pinang “arecanut” (*Areca catechu*), puring (*Codiaeum variegatum*), asam “tamarind” (*Tamarindus indicus*), and pace (*Morinda citrifolia*). Farmers use also wild species growing in open areas such as *Lantana camara* and *Uncaria gambir*.

## **Preparation and Application of Medicinal Plants**

Medicinal plants are either fed directly to the animal or are ground, boiled, or otherwise prepared. Plant parts used in the preparation of veterinary remedies include seeds, leaves, fruits, tubers, roots and rhizomes, or the whole plant as in the case of herbs. Medicinal plants may be given alone or mixed with other ingredients such as eggs and honey.

Diseases of the digestive tract (worms, diarrhea and bloat) were the most frequent application for traditional remedies. Thirteen plant species are used as anthelmintics and nine are used to combat diarrhea. Other health problems tackled with traditional remedies included skin diseases, wounds, anemia, cold and reduced appetite.

## **Conclusions**

People in rural Java use at least 23 plant species to prevent and treat their ruminants’ diseases, especially those of the digestive tract. The medicinal plants include spices, cash crops, fruits and vegetables, as well as ornamental plants, wayside trees and wild plants. Given that commercial drugs are expensive and difficult to get in remote areas, traditional medicine should be developed and considered as an alternative in animal health care.

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**Table 1. Medicinal plants for ruminants in Java.**

Scientific name	Family	Local name	Part used	Application
<i>Allium cepa</i> L.	Amaryllidaceae	Bawang merah	Bulb	Diarrhea
<i>Allium sativum</i> L.	Amaryllidaceae	Bawang putih	Bulb	Worms
<i>Areca catechu</i> L.	Araceae	Pinang	Seeds	Worms, diarrhea, skin disease
<i>Ananas comosus</i> L. Merr.	Bromeliaceae	Nanas	Fruit	Worms
<i>Boesenbergia pandurata</i> (Roxb.) Schlecht.	Zingiberaceae	Kunci	Rhizome	Bloat, itching
<i>Carica papaya</i> L.	Caricaceae	Papaya	Leaves, latex	Worms
<i>Codiaeum variegatum</i> (L.) Bl.	Euphorbiaceae	Puring	Leaves	Worms
<i>Cucurbita moschata</i> (Duck) Poir	Cucurbitaceae	Labu merah	Fruit	Worms, constipation
<i>Curcuma domestica</i> Val.	Zingiberaceae	Kunyit	Rhizome	Worms, wounds
<i>Curcuma xanthorrhiza</i> Roxb.	Zingiberaceae	Temu lawak	Rhizome	Appetizer, worms, diarrhea, anemia
<i>Curcuma heyneana</i> Val. & v. Zijp.	Zingiberaceae	Temu giring	Rhizome	Worms
<i>Lantana camara</i> L.	Verbenaceae	Tembelekan	Herb	Scabies
<i>Manilkara kauki</i> (L.) Dubard	Sapotaceae	Sawo	Leaves, flowers	Diarrhea
<i>Momordica charantia</i> L.	Cucurbitaceae	Paria	Leaves	Worms
<i>Morinda citrifolia</i> L.	Rubiaceae	Pace	Fruit	Worms
<i>Nicotiana tabacum</i> L.	Solanaceae	Tembakau	Leaves	Worms, scabies
<i>Oryza sativa</i> L.	Poaceae	Padi (beras)	Seeds	Diarrhea
<i>Piper nigrum</i> L.	Piperaceae	Merica	Seeds	Worms, tonic
<i>Psidium guajava</i> L.	Myrtaceae	Jambu biji	Leaves, roots	Diarrhea
<i>Tamarindus indica</i> L.	Fabaceae	Asam	Pods	Purgative, skin disease
<i>Uncaria gambir</i> Roxb.	Rubiaceae	Gambir	Fruit	Bloat, diarrhea
<i>Zingiber officinale</i> Roxb.	Zingiberaceae	Jahe	Rhizome	Cold
<i>Zingiber zerumbet</i> (L.) J.E. Smith	Zingiberaceae	Lempuyang	Rhizome	Appetizer, diarrhea

# **TRADITIONAL VETERINARY MEDICINE FOR SMALL RUMINANTS IN WEST JAVA**

**Tri Budhi Murdiati**

## **Introduction**

Sheep and goats are important sources of additional income for Indonesian villagers. Certain common diseases may cause significant economic losses for these people by killing the animals or reducing their production. Examples are gastrointestinal nematodiasis, fascioliasis, and scabies (Ronoharjo and Wilson, 1986). Other diseases, such as bluetongue, myiasis, coccidiasis and foot-and-mouth disease, occur but are economically less important.

Increasing costs of veterinary care and health products prevent farmers from using commercial veterinary drugs. Besides, farmers have their own remedies to keep their animals healthy. The medicinal plants they need for this are abundant in rural areas.

Little information has been published on traditional medicines for sheep and goats in Indonesia. Preliminary surveys (Adjid, 1990; Balitnak, 1977) suggest that in villages the use of traditional medicines for small ruminants is still widespread. This paper describes remedies for sheep and goats from West Java.

## **Methodology**

Between December 1989 and April 1990, 22 farmers from six villages around Bogor, West Java, were interviewed using a structured questionnaire. Staff members of the Research Institute for Veterinary Medicine in Bogor collected additional information during other field projects.

## **Results and Discussion**

Table 1 lists 37 prescriptions farmers in West Java use to treat seven common problems of their small ruminants. Nearly all the prescriptions include medicinal plants that frequently grow in or

around the villages and do not cost the farmers anything. Leaves and rhizomes are the plant parts most frequently applied. Other common ingredients are salt, shrimp paste, sweet soy sauce, eggs and honey. All of these are easily accessible to farmers at relatively low prices.

Most of the plants mentioned in Table 1 are also used to treat human diseases (e.g., Abadi, 1983; Mardiswojo, 1985; Sastroamidjojo, 1988), and may be included in commercial traditional medicines or jamu. Guava leaves, for example, contain tannins and are applied to treat diarrhea in people (Watt and Breyer-Brandwijk, 1962). Scientific studies have proven that a number of plants traditionally used in human ethnomedicines have pharmacological activity (for examples see "Sources on Traditional Veterinary Medicine in Indonesia" in this volume). It is therefore likely that also some of the ethnoveterinary remedies listed in Table 1 work.

The efficacy of some treatments seems to be questionable. Instances are the use of ashes from a traditional Islamic hat (*peci*) to treat scabies, washing diseased eyes with urine, or covering the belly of an animal suffering from bloat with a wet cloth. However, farmers reported that all these remedies worked.

Many farmers judge an animal's health status and the efficacy of a remedy by the animal's feed intake. This may be sufficient for a number of problems, but others may require the attention of a trained veterinarian. But there is little contact between farmers and the local veterinary services. Farmers - especially those who own few animals - rarely seek medication from a veterinarian or other persons providing animal health care. This contrasts with intensive farming systems such as dairying, where veterinarians play an important role in the livestock health care and where the use of expensive commercial drugs is common.

### **Conclusions and Suggestions**

Farmers in villages around Bogor know at least 37 traditional remedies to treat seven problems in their small ruminants. They are likely to continue the use of traditional medicines for their livestock, as the ingredients are abundantly available in the villages and the preparation of the remedies requires little cash. Besides, they have little access to government veterinary services.

Because traditional veterinary medicine is inexpensive, widely used and the ingredients are locally available, it could play an effective role in animal health care. Inexperienced smallholders should receive information on which remedies to use for which diseases. One way to do this might be to provide leaflets or other materials on traditional veterinary medicine when livestock is distributed through government projects. Villagers should also be encouraged to plant medicinal plants around their houses or in the village.

Studies on the efficacy of traditional remedies in small ruminants are needed. Scientific testing is necessary to determine which remedies are effective and can be recommended. Only with such testing can doubts as to the efficacy of suitable traditional techniques be eliminated and these methods become accepted in the animal health care system.

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**Table 1. Traditional remedies for sheep and goats in West Java**

Application	Ingredient	Preparation
Diarrhea	Rhizome of turmeric, very young fruit of jackfruit (tongtolang), and leaf of berenuk ( <i>Crescentia cujete</i> )	grind all ingredients with little water , give orally
	Turmeric leaf and shrimp paste	grind together, give orally
	Rhizome of raja gowah ( <i>Catimbum malaccensis</i> ) and raw potatoes	grind ingredients with little water, give orally
	Leaf of huni ( <i>Antidesma bunius</i> ), leaf of dadap ayam ( <i>Erythrina orientalis</i> ), and salt	grind leaves, add salt, give orally
	Nut of pinang ( <i>Areca catechu</i> )	grind with water, give orally
	Guava leaf and salt	grind together with water, give orally
	Papaya leaf and honey	grind leaf with water , add honey, give orally
Scabies	Leaf of gamal ( <i>Gliricidia sepium</i> )	grind and apply topically
	Fermented cassava tuber (= tape, available in the market)	apply topically
	Leaf of babanjaran ( <i>Eupatorium pallescens</i> )	grind and apply topically
	Used engine oil	apply topically

Table 1. (continued)

Application	Ingredient	Preparation
	Used engine oil and sulfur	mix and apply topically
	Ashes of burnt peci (traditional Islamic hat) and coconut oil	mix well and apply topically
Stimulate appetite	Fruit pulp of tamarind and brown sugar	mash in water, add brown sugar, give juice orally
	Rhizome of lempuyang ( <i>Zingiber zerumbet</i> ) and leaf of turmeric	grind with water, strain, give juice orally
	Rhizome of lempuyang ( <i>Zingiber zerumbet</i> ), egg, and sweet soy sauce	grind lempuyang, mix with other ingredients, give orally
	Rhizome of lempuyang ( <i>Zingiber zerumbet</i> ) and shrimp paste	grind ingredients, give orally
	Rhizome of turmeric and shrimp paste	grind ingredients, give orally
	Rhizome of turmeric and green fruit of pisang batu ( <i>Musa balbisiana</i> )	grind up together, give orally
	Rhizome of langkuas ( <i>Languas galanga</i> ) and honey	grind ingredients and give orally
	Rhizome of langkuas ( <i>Languas galanga</i> ), leaf of turmeric, honey, and egg	grind langkuas and turmeric, add honey and egg, give orally
	Leaf of lemongrass	boil with little water and give the juice

Table 1 (continued)

Application	Ingredient	Preparation
	Banana stem and honey	boil with water, collect juice, add honey, give orally
Intestinal parasite	Rhizome of langkuas ( <i>Languas galanga</i> ), leaf of huni ( <i>Antidesma bunius</i> ), and shrimp paste	grind ingredients, give orally
	Leaf of huni ( <i>Antidesma bunius</i> ), leaf of turmeric, shrimp paste, and sweet soy sauce	grind ingredients, give orally
	Nut of pinang ( <i>Areca catechu</i> ), salt, and shrimp paste	grind ingredients, give orally
	Nut of pinang ( <i>Areca catechu</i> ), rhizome of langkuas ( <i>Languas galanga</i> ), and salt	grind ingredients, give orally
Insect repellent	Grass and left-overs from crops and feed	burn and apply smoke
	Leaf of pinang ( <i>Areca catechu</i> )	grind with water, strain and apply juice orally
Eye disease	Very young fruit of jackfruit (tongtolang)	boil in water, strain and apply the fluid to infected eye
	Leaf of wera ( <i>Hibiscus rosasinensis</i> )	mash with water, strain, and drop fluid in eye
	Water from green coconut	wash eye with the water
	Human urine	wash eye with urine

Table 1. (continued)

Application	Ingredient	Preparation
Bloat	Bamboo leaf	grind with water, strain, drench with fluid
	Coconut oil	drench
	Stalk of papaya leaf	insert into anus
	Wet black cloth	cover belly

# THE USE OF TRADITIONAL MEDICINE FOR SMALL RUMINANTS IN CENTRAL JAVA

D. Gultom, S. Prawirodigdo, W. Dirdjopratono,  
Muryanto and Subiharta

## Introduction

Central Java has about 1.27 million sheep and 2.42 million goats. This is the largest small ruminant population in Java (Dinas Peternakan Propinsi Jawa Tengah, 1989). At least five types of sheep can be distinguished: Javanese Thin-tailed, Javanese Fat-tailed, Barbados, Texel, and crosses between local and introduced breeds. The most important goat breeds are the local kambing kacang and a crossbreed between kambing kacang and Etawah.

Between 1983 and 1987, national flock numbers remained static (Directorate for Livestock Services, 1988). There is potential to increase the small ruminant population in Java, particularly in dry land and upper watershed areas (Soewardi, 1988). But first it is important to understand the causes for the stagnant numbers.

Villagers keep sheep and goats as a source of secondary income and commonly manage them under the traditional system (Martawijaya *et al.*, 1990). The average smallholder raises a flock between 3 and 10 heads, composed of different sex and age groups (Martawijaya *et al.*, 1990).

Both sheep and goats in Indonesia have high fertility rates making them valuable genetic resources (Tillman, 1981). Tillman emphasized that the animals' small sizes and slow growth rates could result from harsh environmental conditions rather than poor genetic potential.

Diseases are an important limitation to the development and growth performance of animals. Government figures indicate that the livestock industry loses about 110.4 billion rupiah a year through deaths and reduced productivity resulting from diseases (Tillman, 1981). Although government veterinary services monitor and com-

bat diseases, control in remote areas is difficult or impossible because of poor transportation. Many farmers therefore depend on traditional medicine to treat their animals.

Although people in Central Java have long used medicines made of herbs, animal products and minerals to treat and prevent animal diseases (Tan, 1929), little information is available on this topic. Based on a survey in Central Java, this study describes the use of traditional medicine for small ruminants in Central Java. It lists medicinal plants and treatments reported by smallholders.

## **Materials and Methods**

A survey was conducted in five districts in Central Java located both in the uplands (Karanganyar, Temanggung and Wonogiri) and lowlands (Kendal and Semarang).

In each district, one village was chosen based on its small ruminant population and 10 farmers per village were randomly selected. The 50 farmers thereby chosen were interviewed using a structured questionnaire.

Published information on traditional veterinary medicine was also collected and discussions were held with representatives of industries manufacturing traditional medicines, the provincial livestock services, the Department of Veterinary Science of Gajah Mada University in Yogyakarta, and the Medical Faculty of Diponegoro University in Semarang.

## **Results and Discussion**

The respondents reported many remedies for sheep and goat diseases they knew to be common, i.e., diarrhea, bloat and scabies (Table 1). The medicines contained either a single constituent or a combination of ingredients, most of which were available locally. Table 2 shows the prescriptions smallholders in Central Java said they used to treat small ruminant diseases.

Our research suggests that the use of traditional veterinary medicine is lower in villages that are close to cities and easily monitored by veterinary services. On the other hand, people in remote areas still rely on traditional remedies.

The stockowners stated that they inherited their knowledge of traditional medicines from their forebears. They regarded many remedies as effective. But in most cases, they did not know why a remedy was used for a certain disease or why it worked.

**Table 1. Diseases of sheep and goats in villages in Central Java as reported by farmers**

No. Disease	Rank	Disease frequency (%) based on	
		# of cases reported	# of respondents
1 Diarrhea	1=	19.74	62.50
2 Bloat	1=	19.74	62.50
3 Scabies	3	18.42	58.33
4 Pink eye	4	11.84	37.50
5 Worms	5	9.20	29.17
6 Hoof infections	6	6.58	20.83
7 Orf	7=	3.95	12.50
8 Milk fever	7=	3.95	12.50
9 Poisoning	9=	2.63	8.33
10 Dystocia	9=	2.63	8.33
11 Paralysis	11	1.32	4.17

Unfortunately, some respondents did not have the knowledge and experience to prepare medicines, and let sick animals die without any treatment. The promotion of traditional veterinary medicine in villages would benefit such villagers, especially those with low incomes.

The commercial production of traditional medicines for animals is little developed. So far, only a few commercially produced prescriptions are available (Table 3). This contrasts with a large number of enterprises manufacturing jamu and other traditional medicines for humans. In Central Java, for example, about 20 such enterprises exist.

## Conclusions and Recommendations

According to the smallholders interviewed, diarrhea, bloat and scabies are the most frequent ruminant diseases. Respondents knew several traditional treatments for these and other livestock diseases. They are likely to continue to use traditional medicines for both themselves and their animals, especially if they live in remote areas. Not all smallholders, however, are able to prepare traditional medicines.

If traditional medicines are to be promoted, their effectiveness must be tested scientifically. In-depth surveys should be conducted to determine which herbs, fruits, roots and other materials stock-owners use for the preparation of traditional remedies. Samples of promising remedies should be analyzed to determine their chemical composition. On-station and field experiments are necessary to test the efficacy and determine the optimal dosages for each disease and animal species.

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**Table 2. Medicines and treatments for sheep and goats used by smallholders in Central Java .**

Disease/ problem	Ingredients and preparation	Directions for use
Diarrhea	Fresh papaya leaves	feed as forage
	Grind fresh papaya leaves and a small amount of salt, mix with 1-2 glasses of boiled water, strain	give fluid orally 1x/day
	Grind fresh guava leaves, mix with 2 glasses of boiled water, strain	give ca. 100 cc orally per day
	Root or stem of guava, add water, boil, strain	give ca. 100 cc orally per day
	Fresh leaf or bark of salam ( <i>Syzygium polyanthum</i> ), add water, boil, strain	give ca. 100 cc orally per day
	Grind rhizome of temu lawak ( <i>Curcuma xanthorrhiza</i> ), add boiled water, strain	give ca. 100 cc orally per day
	Pour boiling water over tea leaves, let stand for 5 minutes, strain	give ca. 100 cc orally per day
	Boil root of alang-alang ( <i>Imperata cylindrica</i> ) with palm sugar and water, strain	give ca. 100 cc orally per day
	Jackfruit and mango leaves	feed as forage 1x/day or 2x/day for heavy diarrhea
	Mix basil seeds with rice bran	feed as a ration
	Mix basil seeds with boiling water, strain	give to drink
	Dilute juice of jeruk nipis ( <i>Citrus aurantifolia</i> ) fruits with ca. 100 cc of boiling water	give 100 cc/day orally
	Fresh banana leaves	feed as forage 1x or 2x/day
Collect sap of banana stem	give orally 1x/day until recovery	
Fresh waru ( <i>Hibiscus tiliaceus</i> ) leaves	feed as forage 1x/day	

Table 2 (continued)

Disease/ problems	Ingredients and preparations	Directions for use
	Fresh scrut ( <i>Streblus asper</i> ) leaves leaves	feed as forage 1x/day
Diarrhea	Grind turmeric rhizome, mix with limestone, press out juice, dilute with water, strain	give orally 1x/day
	Fresh bamboo leaves	feed as forage 1x/day
	Cook cassava tuber with water and 1 teaspoon of salt, mash	feed 0.5 kg/animal 1x or 2x/day
	Grind sidomolo ( <i>Artemisia vulgaris</i> ) leaves, add 1 or 2 glasses of water and 1 teaspoon of salt, strain.	give orally 1x/day
	Dissolve 1 teaspoon of salt in water from boiled rice	give to drink <i>ad lib.</i>
Bloat	Grind ginger rhizome with 1 teaspoon of coffee meal and 1 teaspoon of salt, add boiling water, strain	give 100-150 cc/day orally
	Grind ginger rhizome	rub on body 1-3x/day until recovery
	Grill and grind ginger rhizome, add 1 glass of boiling water, strain	give 100-150 cc/day orally
	Mix 1 teaspoon of coffee meal and 1 teaspoon of salt with 1 glass of boiling water	give 100-150 cc orally every second day
	Mix 1 teaspoon of coffee meal and 1 small teaspoon of salt with a small amount of dried salted fish	feed 1x/day
	Stalk of papaya leaf	insert into rectum while someone else massages stomach 1x/day until recovery
	Fresh papaya leaves	feed as forage
	Grind fresh papaya leaves, mix	give 100-150 cc orally

Table 2 (continued)

Disease/ problem	Ingredients and preparation	Directions for use
	with water, add 1 small teaspoon of salt, strain	2x/day
Bloat	Boil palm sugar with water	give orally 1x/day
	Grind 10 g each of kencur ( <i>Kaempferia galanga</i> ) and ginger rhizome, add 1 glass of water, strain	give orally 1x/day
	Grind 5 shallot cloves and 2 cloves of garlic with 10 g palm sugar, mix with 1 glass of boiling water, strain	give orally 1x/day
	Grind fresh adas ( <i>Foeniculum vulgare</i> ) leaves, mix with coconut oil	rub on body as an ointment
	Boil ca. 100 g rhizome of temu hitam ( <i>Curcuma domestica</i> ) and 1 teaspoon of salt in water, strain	give 1 glass orally per day
	Mix 250 g fresh duduk ( <i>Desmodium triquetrum</i> ) leaves with 2 teaspoons of salt and 2 glasses of boiling water, strain	give 1 glass orally per day
	Mix 3 small pieces of yeast and 200 g dry cooked rice with a small amount of boiling water	feed as a ration
Scabies	Rheumason (proprietary ointment)	massage on stomach
	Kerosene	massage on stomach
	Heat	put animal close to fire until recovery
	Tobacco leaves	rub on affected skin
	Fresh mindi ( <i>Melia azedarach</i> ) leaves	rub on affected skin
	Fresh lamtoro ( <i>Leucaena leucocephala</i> ) leaves	rub on affected skin

Table 2 (continued)

Disease/ problem	Ingredients and preparation	Directions for use
Scabies	Fresh gliricidia leaves	wash the animal with soap and water, then rub body with leaves
	Grind fresh gliricidia leaves, mix with coconut oil	wash the animal with soap and water, then rub mixture on body
	Grind root of jenu ( <i>Derris elliptica</i> ), press fluid out	apply externally as an ointment
	Grind fresh maringgo ( <i>Moringa oleifera</i> ) leaves, press fluid out	apply externally as an ointment
	Grind fresh ketepeng ( <i>Cassia alata</i> ) leaves, press fluid out	apply externally as an ointment
	Used engine oil	apply externally as an ointment, allow to dry in sun
	Fresh bangkoang ( <i>Pachyrrhizus erosus</i> ) leaves	rub on affected skin
	Mix engine or coconut oil with sulfur	apply externally as an ointment 1x/day for 3 days
	Coconut meal	cover skin with meal, protect with cloth, leave over night, repeat until skin recovers
	Ash of firewood	rub on skin
Pink eye	Mix 100 g copper sulfate with 100 g naphthalene, diluted limestone, and coconut meal	apply externally as an ointment
	Grind 5 fresh leaves of sirih ( <i>Piper betle</i> ), add 1 glass of water, strain	wash eyes with the liquid
	Dissolve 1 teaspoon of salt in 1 glass of hot water	wash eyes with the solution
	Press out juice of jeruk nipis ( <i>Citrus aurantifolia</i> ) fruits	wash the eye with the juice

Table 2 (continued)

Disease/ problem	Ingredients and preparation	Directions for use
	Urine	wash the eyes with urine or put ca. 5 drops in eye
Worms	Grind seed of pinang ( <i>Areca catechu</i> ) fruit, dilute with 1 glass of water	give 1x/day orally for 3 days
	Grind dried pinang ( <i>Areca catechu</i> ) seeds, add soft palm sugar, knead until crumbly (2 g/crumb)	feed 4 crumbs/day
	Fresh ketapang ( <i>Terminalia catappa</i> ) leaves	feed as forage
Worms	Skin of cashew fruits	feed 1x/day for 3 days
	Cucumber seeds	feed 1x/day for 3 days
	Press out juice of pineapple fruit	give orally 1x/day
	Grind rhizome of temu hitam ( <i>Curcuma aeruginosa</i> ) and 1 teaspoon of salt, add 1 glass of water, strain	give 1x/day orally for 3 days
	Grind tobacco leaves, add 1 glass of water, strain	give orally 1x/day
	Grind 3 fresh papaya leaves, mix with 1 glass of water and 1 teaspoon of salt, strain	give 1x/day orally until recovery
	Grind fresh waru ( <i>Hibiscus tiliaceus</i> ) leaves, mix with water and 1 spoon of salt, strain	give orally 1x/day
	Grind young bamboo shoots, add water and salt, strain	give every day
	Grind fresh sidomolo ( <i>Artemisia vulgaris</i> ) leaves, press juice out, add 1 teaspoon of salt	give orally 3x/day
	Fry 1 spoon of lamtoro ( <i>Leucaena leucocephala</i> ) seeds (without coconut oil), grind, add 1 small spoon of salt and 1 glass of water	give 1 glass/day orally

Table 2 (continued)

Disease/ problem	Ingredients and preparation	Directions for use
Hoof infections	Mix tobacco leaves with engine oil	put mixture on infected area daily until recovery
	Mix tobacco leaves with 70% alcohol	put mixture on infected area
	Iodine tincture	put on infected area
	Grind charcoal from coconut shells, mix with coconut oil	use as an ointment 2x/day for 3 days
	Fresh cassava meal	cover infected area with meal
	Sulfanilamide	wash infected area with hot water, clean with 70% alcohol, then cover with sulfanilamide
Orf	Dissolve copper sulfate in hot water	wash affected area, then rub in mixture
	Dissolve salt in hot water	wash affected area, then rub in mixture
	Used engine oil	wash affected area with soap and water, then apply oil as an ointment 3x/day for one week
Milk fever	Midrib of coconut leaf	use a small bound of coconut leaf midribs as a physical stimulant and poke mammary gland 5 times every 6 hours carefully
Poisoning	Mix soybean meal and water	feed 2-3x/day
	Mix soybean meal and palm sugar	feed
	Mix 0.5 teaspoon of coriander and 0.5 teaspoon of salt with 1 glass of water	drench 2-3x/day
	Dissolve 1 teaspoon of urea with water	give orally

Table 2 (continued)

Disease/ problem	Ingredients and preparation	Directions for use
Poisoning	Two teaspoons of coconut oil	give orally
	Mix coconut water and 1 teaspoon of salt	give orally
	Bum kapok seeds	place animal in smoke
	Mix juice of papaya fruit with salt, strain	drench
	Grind 5 shallot cloves and 2 cloves of garlic, add palm sugar and water	drench
Dystocia	Fresh young sugarcane leaves	feed as forage
	Fresh guava leaves	feed as forage
Low milk production	Fresh waru ( <i>Hibiscus tiliaceus</i> ) leaves	feed as forage
	Grind fresh root of bidara upas ( <i>Merremia mammosa</i> ), collect transparent fluid	drench 3x/day
	Boil fresh leaf of dadap ayam ( <i>Erythrina orientalis</i> ) with coconut water, strain	drench 3x/day
	Fresh sembukan ( <i>Paederia foetida</i> ) leaves	feed as forage
	Fresh saga ( <i>Abrus precatorius</i> ) leaves	feed as forage
	Fresh leaves of lawatan (scientific name unknown)	feed as forage
	Fresh katu ( <i>Sauropus androgynus</i> ) leaves	feed as forage
	Grind fresh papaya leaves, cumin seeds and salt, dilute with water, strain	drench 3x/day
Bleeding after birth	Fresh young bamboo leaves	feed as forage

Table 2 (continued)

Disease/ problem	Ingredients and preparation	Directions for use
Loss of appetite	Grind 50 g seeds each of jinten hitam ( <i>Nigella sativa</i> ) and adas ( <i>Foeniculum vulgare</i> ), add 0.5 glass of water and 0.5 teaspoon of salt	give orally 1x/day
	Mix 50 g cumin seeds, 1 kg of sun-dried boiled rice, 1 teaspoon of salt and hot water	feed 2x/day
	Grind papaya leaves and rhizome of temu lawak ( <i>Curcuma xanthorrhiza</i> ), add water, ash and 1 teaspoon of salt, strain	give orally 1x/day
	Grind 1 teaspoon of lamtoro ( <i>Leucaena leucocephala</i> ) seeds and 1 teaspoon of salt, add 1 glass of water	give orally 1x/day
	Boil rhizome of temu lawak ( <i>Curcuma xanthorrhiza</i> ) with water, strain	give 100 cc/day orally
	Slice stem of bratawali ( <i>Tinospora crispa</i> ), add boiling water, strain	give 100 cc/day orally
	Boil young root of sembung ( <i>Blumea balsamifera</i> ) with water, strain	give 100 cc/day orally
	Sweet soy sauce	give 50 cc/day orally
Myiasis	Chop tobacco leaves	wash wound with hot water and then with 70% alcohol, then cover with chopped leaves; apply 2x/day for 2 days
	Grind naphthalene	cover affected area 1x/day for 2 days
Influenza	Grill or burn ginger rhizome, add boiling water	give orally 2x/day

Table 2. (Continued)

Disease/problems	Ingredients and preparations	Directions for use
Influenza	Pour boiling water over 2 seeds of mahogany, strain	give orally 1x/day
	Slice seeds of gambas ( <i>Luffa cylindrica</i> ), add boiling water, strain	give orally 1x/day
Sprains/paralysis	Grind fresh somjawa ( <i>Talinum paniculatum</i> ) leaves	put on affected area, cover with other material (e.g., bind with cloth)
Fever	Slice stem of banana tree, mix with earthworms, grind and cook	feed
	Slice stem of bratawali ( <i>Tinospora crispa</i> ), add boiling water, strain	give orally 1x/day
	Boil root or leaves of katu ( <i>Sauropus androgynus</i> ) with water, strain	give orally 1x/day
	Juice of pineapple fruit	give orally 1x/day
	Boil root of pule pandak ( <i>Rauvolfia serpentina</i> ) in water, strain	give 50 cc/day orally
	Grind rhizome of temu hitam ( <i>Curcuma aeruginosa</i> ), add water, strain	give 100-150 cc/day orally
	Boil seruni ( <i>Spilanthes acmella</i> ) flowers with water, strain	give orally 1x/day
Lack of estrus	Skin of ripe jackfruit	feed
Reduced fertility	Grind 20 g turmeric rhizome, 10 g seeds of adas ( <i>Foeniculum vulgare</i> ) and bark of pulo waras ( <i>Alyxia reinwardtii</i> ), 15 g rhizome of lempuyang ( <i>Zingiber zerumbet</i> ), and 4 g rhizome of temu lawak ( <i>Curcuma xanihorrhiza</i> ), add 100 cc of water, strain	give orally 1x/day for a month; stimulates fertility in female animals by reducing abdominal fat near reproductivetract

**Table 3. Traditional medicines or jamu for livestock commercially produced**

**STIMULATE APPETITE, MAINTAIN HEALTH, GIVE STRENGTH**

Temu lawak ( <i>Curcuma</i> rhizoma) ad.	100 %
Sodium subcarbonate	30 %
Vitamin A	2750 IU
Vitamin D	220 IU

Give orally 2-3 x/week (produced by EKAFARMA)

Meniran ( <i>Phyllanthi</i> herba)	10 %
Babaan pule ( <i>Alstoniae</i> cortex)	8 %
Temu lawak ( <i>Curcuma</i> rhizoma)	10 %
Jahe ( <i>Zingiberis</i> rhizoma)	15 %
Cabe Jawa ( <i>Retrofracti</i> fructus)	8 %
Pegagan ( <i>Centella</i> herba)	10 %
Alba ( <i>Eucalypti</i> fructus)	30 %
Kemukus ( <i>Cubebae</i> fructus)	4 %
Adas ( <i>Foeniculi</i> fructus)	5 %

Give orally 2-3 x/week (produced by AKARSARI)

**MAINTAIN HEALTH, ACCELERATE DIGESTION**

Temu lawak ( <i>Curcuma</i> rhizoma) ad.	100 %
Sodium subcarbonate	30 %
Vitamin A	30 IU
Vitamin D	3 IU

Give orally 2-3 x/week (produced by EKAFARMA)

**MAINTAIN HEALTH, GIVE STRENGTH, INCREASE RESISTANCE**

Cabe Jawa ( <i>Retrofracti</i> fructus)	4 %
Alba ( <i>Eucalypti</i> fructus)	48 %
Jahe ( <i>Zingiberis</i> rhizoma)	8 %
Temu lawak ( <i>Curcuma</i> rhizoma)	8 %
Meniran ( <i>Phyllanthi</i> herba)	8 %

Babaan pule ( <i>Alstoniae cortex</i> )	8 %
Pegagan ( <i>Centellae herba</i> )	8 %
Park. Sem	4 %
Sulfur praecip	4 %

Give orally 2-3x/week (produced by PT JAGO)

Kayu legi (*Glycyrrhizae radix*)  
 Adas (*Foeniculi fructus*)  
 Ketumbar (*Coriandry fructus*)  
 Kapulaga (*Cardamomi fructus*)

Give orally 2-3 x/week (produced by SIDOMUNCUL)

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<sup>1</sup> Wording of prescriptions is taken from the jamu packages, which follow the pharmacological style (e.g., *Curcumae rhizoma* instead of rhizome of *Curcuma xanthorrhiza*).

# **TRADITIONAL VETERINARY MEDICINE FOR RUMINANTS IN EAST JAVA**

**Komarudin Ma'sum**

## **Introduction**

Diseases and parasitic infestation reduce livestock production and sometimes kill the animals. Effective preventive and curative practices can alleviate this problem. But commercial veterinary drugs are difficult to get in remote areas, and farmers often cannot afford them. For certain diseases and parasitic infestations, traditional remedies could be an alternative to expensive drugs. However, information and publications on traditional veterinary medicine in East Java are very limited. This paper lists remedies used by farmers from different districts in East Java to treat their ruminants.

## **Methodology**

A field study was conducted in East Java in March 1990 to collect information on traditional veterinary medicine from 16 villages in 14 districts in East Java. A total of 20 farmers were interviewed using a structured questionnaire.

Further information was obtained from staff members of the provincial and district livestock services, Airlangga University in Surabaya and Brawijaya University in Malang, the Unit Pelaksanaan Teknis (UPT) Kambing in Singosari, Malang, the Pusat Pembibitan Ternak - Hijauan Makanan Ternak (PPT-HMT) both in Malang and Jember, and from sellers of traditional medicine.

## **Results and Discussion**

Farmers in East Java know many remedies to treat livestock diseases. Table 1 shows the names of ingredients, the disease treated, livestock species, and the preparation and application for each remedy.

Ingredients and applications vary between regions within East Java, indicating that cultural factors, trial and error, and the local availability of medicinal plants and materials may influence the composition and use of a remedy. Some ingredients and treatments

are more widespread than others. Examples include used engine oil against scabies and tobacco against maggots.

The efficacy of many traditional veterinary remedies has not yet been confirmed scientifically. One may argue, however, that in the absence of modern drugs, smallholders in remote areas are better off with traditional remedies - the efficacy of which is not yet confirmed - than without any alternative to treat livestock diseases.

**Table 1. Traditional veterinary medicine used for ruminants in East Java**

Disease/ problem	Spec. <sup>1</sup>	Ingredients	Directions for use (District)
Appetizer	S	Jamu (commercial)	Mix with water; drench 1x every 2 months (Pasuruan)
	C	Mengkudu ( <i>Morinda citrifolia</i> ) fruit	Give orally every day until the animal shows good appetite (Tulungagung)
	C, B, SR	Young leaves of tamarind (sinom), leaves of sembukan ( <i>Paederia foetida</i> ), rhizome of temu lawak ( <i>Curcuma xanthorrhiza</i> ), rhizome of lempuyang ( <i>Zingiber zerumbet</i> ), tamarind, salt, and water  see also "bloat," "anorexia, anemia"	Mix all ingredients, stir until uniform; drench (Mojokerto)
Fattening	SR	Kacang panjang ( <i>Vigna unguiculata</i> ) leaves	Pound 2 fistfuls, squeeze juice out; drench 1x/month (Jember)
	C	0.5 kg bark of pulai ( <i>Alstonia scholaris</i> ), half a handful of salt, and water	Boil all ingredients; drench every 3 days (Jember)
	SR	150 g cooked salted fish and 50 g tamarind	Mix and pound ingredients, drench (Malang)
Low milk production	C	1 kg turmeric rhizome, 0.5 kg tamarind, 10 eggs water, and salt to taste	Wash turmeric, pound and squeeze until juice comes out; strain and collect juice; remove seeds of tamarind, add water to fruit, squeeze until juice comes out; mix turmeric and tamarind juices and add eggs one by one; add salt and mix until uniform; drench 1x/week (Tuban)

<sup>1</sup> C = cattle, CI = calf, B = buffalo, S = sheep, G = goat, SR = sheep and goat, R = ruminants

Table 1. continued.

Disease/ problem	Spec	Ingredients	Directions for use (District)
Broken leg	SR	Bark of waru ( <i>Hibiscus tiliaceus</i> )	Tie bark around broken leg 1x/day until recovery (Jember)
Wounds infested with maggots	C	Tobacco	Soak tobacco in water, cover wound or infected area 1x/day until cured (Lamongan, Gresik)
	C	1 quid of tobacco, kerosene, and 1 naphthalene ball	Pound and mix ingredients, apply to infected area 1x/day (Jember)
Chronic wound	C	Baygon (commercial insecticide), limestone, and turmeric rhizome	Wash wound; put 1 drop of Baygon on wound; mix turmeric and limestone and cover wound (Mojokerto)
Skin disease (general)	R	Mahogany seeds, coconut oil, and water	Pound seeds, add coconut oil and water; apply to infected area until cured (Tulungagung)
Lice	C	Young soursop fruit	Grate; apply 1 fruit/day externally (Jember)
		Blossoms of pinang ( <i>Areca catechu</i> )	Pound 3 handfuls; apply externally 1x/day until cured (Jember)
Ticks	C	Aqua (commercial drinking water), 1 large gecko	Kill and burn gecko; feed (usually 1 application sufficient); drop Aqua on ticks until they fall off (Lamongan)
Scabies	G	Sulfur and used engine oil	Ground sulfur into powder mix well with oil until it becomes a paste; apply to infected area morning and evening for 4-8 days or until itching disappears (Ngawi)
			Wash animal and scrub skin with galing ( <i>Cayratia trifolia</i> ) leaf before applying paste (Mojokerto)

Table 1 (continued)

Disease/ problem	Spec. <sup>1</sup>	Ingredients	Directions for use (District)
	C, B, G	Oil and kerosene	Mix oil and kerosene; wash animal and scrub skin with mengkudu ( <i>Morinda citrifolia</i> ) leaf; apply mixture (Mojokerto)
Scabies	SR	Sulfur and and coconut oil	Pound sulfur into powder, mix with coconut oil (1:5); apply mixture 2x/day until cured (Lamongan)  Scrub animal with galing ( <i>Cayratia trifolia</i> ) leaf before applying mixture (Gresik)
	G	Sulfur and (frying) oil	Mix sulfur with oil; apply externally for 5 days (Ponorogo) or 2x/week (Jember)
	SR	Naphthalene and cajuput oil	Pound naphthalene; mix with oil; apply externally 2x/week (Jember)
	G	Mindi ( <i>Melia azedarach</i> ) leaves	Feed with grass or rub with lukewarm water on infected area (Malang)
	G	1 ltr coconut oil, 0.5 ltr kerosene, 200 g sulfur, and naphthalene	Mix all ingredients; apply externally (1 prescription is sufficient for 7-8 animals) (Malang)
	B	Sulfur, naphthalene, and used engine oil	Pound sulfur and naphthalene; mix with oil; boil mixture; let cool down and apply externally 2x/day morning and evening; cures scabies within 3 days (Madiun)
Gastro- intestinal parasites	SR	Young fruit of pinang ( <i>Areca catechu</i> )	Dry fruit and pound; feed 1x/week (Jember)
	C		Peel fruit, take meat, grate and dry it; add water; drench 1x/3 months (Gresik)

Table 1 (continued)

Disease/ problem	Spec	Ingredients	Directions for use (District)
Gastro- intestinal parasites	R	0.5 kg rhizome of temu hitam ( <i>Curcuma aeruginosa</i> )	Squeeze with a liter of water, collect the fluid; drench 1x/3 months (Tuban)
	C	Rhizome of temu hitam ( <i>Curcuma aeruginosa</i> ), and meat of a coconut that has fallen from tree	Grate temu hitam and coconut; mix together and dry; give orally 1x/day (Lumajang)
	B, CI	Blossoms of green bananas	Boil blossoms with little water, let cool down; drench with fluid (Mojokerto)
Ascariasis	C, CI	Garlic and water (amount of garlic depends on size of animal)	Pound garlic, add water; drench mixture 1x/3 days (Tulungagung)
	CI	Cucumber	Cook; feed 1x/day (Tulungagung)
Distoma- tosis (oedema between neck and lower jaw)	C	10 pieces of ragi (local yeast), 2 pieces of tempe busuk (spoiled fermented soybean cake), cumin seeds, stem of bratawali ( <i>Tinospora crispa</i> ), and rhizome of temu hitam ( <i>Curcuma aeruginosa</i> )	Boil all ingredients with 10 glasses of water, let cool down, strain; drench 1x/3 weeks for 3 months (Ngawi)
Diarrhea	R	Guava leaves	Feed as forage until diarrhea stops; give sugar water to maintain body condition (Mojokerto)
	G	1 fistful guava leaves, 5 g limestone, and 1 ltr water	Boil leaves with limestone in water, boil down to 0.5 ltr; strain; drench 1x/day for 3 days (Ngawi)
	C	Young guava leaves, salt, charcoal, and 1 ltr lukewarm water	Pound ingredients, add water, stir and strain; drench with fluid 2x/day; takes 2 days to cure (Madiun)

Table 1 (continued)

Disease/ problem	Spec.	Ingredients	Directions for use (District)
	R	Rhizome of kuaci pepet ( <i>Kaempferia angustifolia</i> ), salt, and water	Mix ingredients carefully drench 2x/day (Mojokerto)
	R	Rhizome of lempuyang ( <i>Zingiber zerumbet</i> ), 0.5 kg castor sugar, and 10 ltr water	Grate lempuyang, add sugar and water, pound and squeeze out juice; drench 3x/day (Mojokerto)
Diarrhea	C, B	5 fruits of pinang ( <i>Areca catechu</i> ), and 2 glasses of water	Char and grind fruits, mix with water; drench 1x/day (Lamongan)
	C	Tamarind, turmeric rhizome, sap of pinang ( <i>Areca catechu</i> ), and 1 egg	Grate turmeric, add tamarind and sap of pinang; add egg; drench 2x/day until cured (Lumajang)
	C	3 banana blossoms	Slice and feed (Jember)
	C	Banana fruit (pisang raja), stem from young banana tree, tamarind, salt, and 1 egg	Grate banana stem and squeeze out juice; add other ingredients, pound and mix well; drench 2x or until diarrhea stops (Lumajang)
Bloat	C	ca. 1 ltr of coconut oil and stem of papaya leaf	Drench oil 1x/day; insert stem into the anus to stimulate flatulence (Gresik)
	S	1 spoon of coconut oil, salt, 1 spoon of tamarind, and 1 cup of water	Mix all ingredients; drench (Pasuran)
	C	Tamarind, brown sugar, and water	Add water to tamarind and brown sugar and stir; drench 2x/day until cured (Lumajang)
	G	Tamarind, shrimp paste, sugar, kitchen ash, and water	Mix all ingredients to make 1 ltr; drench (Malang)
	R	Limestone	Rub thick layer on stomach (Mojokerto)

Table 1 (continued)

Disease/ problem	Spec.	Ingredients	Directions for use (District)
Bloat	SR	Coffee meal and 1 glass of water	Stir coffee in water; drench (Mojokerto)
	R	Brown sugar, a piece of wood, and 1 glass of lukewarm water	Mix sugar with water, drench; let cattle chew on wood (Mojokerto)
	G	Leaves of sembukan ( <i>Paederia foetida</i> ) and vegetable oil	Squeeze juice out of leaves, add vegetable oil <i>ad lib</i> ; apply externally to lower stomach, perineum area and waist 2x/day; mixture keeps for 1 week (Madiun)
	R	Ginger rhizome and water	Pound ginger, add a little water; drench (Tulungagung)
Bloat, Anorexia, anemia	C, G	Spoiled banana stem	Squeeze juice out; drench with 0.25 ltr 1x/day until symptoms disappear; addition of cajuput oil to mixture improves results (Pacitan)
Constipation	C	Leaves of patik mas (scientific name unknown)	Feed 2 kg every day (Jember)
Poisoning (foamy mouth)	R	Water from a green coconut	Drench with as much water as possible (Gresik, Lamongan, Ngawi)
	C, SR		Add salt to taste to water; drench 3x/day (Tuban)
	R	Coconut oil	Drench with 0.25 ltr (ca. 1 glass) 1x/day (Lamongan)
	R	Tamarind, salt, coconut water, vegetable oil, and water	Mix all ingredients, stir until uniform; drench 2x/day (Mojokerto)
Influenza	C	Old cloth (gombal)	Burn 1 cloth under the animal's nose 1x/day until cured (Jember)

Table 1 (continued)

Disease/ problem	Spec.	Ingredients	Directions for use (District)
Inflam- mation and fever after vaccination-	C, B	Bark and leaf of dadap serep ( <i>Erythrina subumbrans</i> )	Apply sap of bark to affected area or cover it with leaf until inflammation disappears (Lamongan)
Papilloma	C	Leaves of mangkokan ( <i>Polycias scutellarium</i> ) and prawn paste (petis)	Pound ingredients until uniform; slice papilloma; cover with paste; apply 2x/day until cured (Lumajang)
Pink eye	SR	Juice of jeruk nipis ( <i>Citrus aurantifolia</i> ) fruit	Drop juice into infected eye 1x/day until cured (Jember, Tulungagung)
	S	Salt water	Sprinkle salt water into infected eye 1x/2 days until cured (Pasuruan)
Retention of after- birth	C	Leaves of bamboo (bambu apus) and waru ( <i>Hibiscus tiliaceus</i> ); and turmeric rhizome	Mix all ingredients, feed every day (Jember)
	C, B	Bamboo leaves	Leave animal in the sun, feed leaves as forage (Mojokerto)
Mastitis	C	Tamarind and brown sugar	Mix ingredients until uniform; rub on swollen udder (Mojokerto)

# **BIBLIOGRAPHY ON TRADITIONAL VETERINARY MEDICINE IN INDONESIA**

**Tri Budhi Murdiati and Zakhia Muhajan**

## **Introduction**

In Indonesia, the value of traditional medicine has been recognized for many years. The large number of jamu (traditional medicine) factories and numerous publications on human ethnomedicine attest to this. But the bulk of research and publications on traditional medicine deal with remedies and practices for humans. Where animals are mentioned, they usually serve as a model for studies on a human disease rather than on their own right.

Farmers often use the same remedies for humans and animals. This implies that many publications discussing ingredients and active principles of medicinal plants are relevant to both human and veterinary medicine. However, it is very likely that dosages and applications differ for people and animals. Therefore it is necessary to collect and document information on how farmers prevent and treat livestock diseases as well as on laboratory or field studies on the efficacy of traditional medicine in livestock.

Our compilation lists abstracts of references on traditional veterinary medicine in Indonesia and publications on laboratory studies of medicinal plants relevant to ethnoveterinary practices for sheep and goats. We have included also publications on other domestic animals and humans if we regarded them as possibly relevant to small ruminants and their health status. At the end of this chapter, we list some monographs on Indonesian botany and human ethnomedicine that may be useful to the reader.

## **Sources of Information on Traditional Veterinary Medicine**

We searched for information on traditional veterinary medicine in the following Indonesian institutions:

1. *Government research institutions:*

- Balai Penelitian Veteriner (Research Institute for Animal Disease), Bogor
- Pusat Penelitian dan Pengembangan Biologi (Research and Development Centre for Biology), Bogor
- Balai Penelitian Tanaman Rempah dan Obat-obatan (Research Institute for Spices and Medicinal Crops), Bogor
- Badan Penelitian dan Pengembangan Kesehatan, Departemen Kesehatan, Dir. Obat Tradisional (Agency for Research and Development, Ministry of Health, Directorate of Traditional Medicine), Jakarta
- Pusat Perpustakaan Pertanian dan Komunikasi Penelitian (National Library for Agricultural Sciences), Bogor.

2. *Universities:*

- Institute Pertanian Bogor, Bogor
- Universitas Indonesia, Jakarta
- Institute Teknologi Bandung, Bandung.

3. *Jamu factories (by correspondence):*

- Jamu Cap Jago, Semarang
- Jamu Air Mancur, Solo
- Jamu Nyonya Meneer, Semarang.

We drew on the following types of publications:

1. Monographs on medicinal plants

2. Research papers, abstracts and proceedings, relating to four main research areas:

- pharmacological activity and toxicity of medicinal plants
- chemistry including phytochemistry, isolation and identifica-

tion of active compounds

- production of medicinal plants
- inventories of medicinal plants from different parts of Indonesia.

### 3. Other publications

- newspapers
- magazines (e.g., Trubus).

Unpublished sources included papers and reports from the institutions mentioned above, information written on jamu packages sold in the market, and personal communications with scientists and farmers.

## Bibliography

- Adjid, R.M.A. 1990. Survey of traditional medicine use for sheep health problems by OPP farmers in the Bogor District of West Java. Working Paper No 118. SR-CRSP, Puslit-bangrak, Bogor.

This study is based on interviews with 17 farmers participating in the Outreach Pilot Project of the Small Ruminant Collaborative Research Support Program in villages of Bogor district, West Java. The farmers knew traditional treatments for some 18 health problems of sheep and goats that were described to them. Their remedies consisted mainly of medicinal plants and some other ingredients such as salt, shrimp paste and sweet soy sauce.

- Agil, M. 1988. Pengaruh infus daun katu terhadap sekresi air susu mencit betina menyusui. (Effect of *Sauropus androgynus* leaf on the milk yield in lactating mice.) In: "Simposium Penelitian Tumbuhan Obat VI," University of Indonesia- PERHIPBA, Depok, 14-19 November 1988. PERHIPBA, University of Indonesia, Jakarta. pp. 90-91.

The effect of katu (*Sauropus androgynus*) leaves on rat milk yield was studied using 10% and 20% leaf infusions. The milk yield was estimated by measuring the weight gain of the offspring after suckling. The results suggest that katu leaves increase milk yield in lactating rats.

- Caropeboka, A.M. 1977. Pengaruh ekstrak akar *Pimpinella alpina* Koord. terhadap siklus berahi mencit. (Effect of *Pimpinella alpina* Koord. root extract on the estrous cycle in mice.) In: N. Wulijarni-Sucipto and M. A. Rifai (eds.). "Simposium Penelitian Tumbuhan Obat II," Bogor Agricultural University, Bogor, 24-25 November 1977. Department of Physiology and Pharmacology, Faculty of Veterinary Science, Bogor Agricultural University, Bogor. pp. 35-37.

The study used two groups of mature unmated mice. One group received *Pimpinella alpina* root extract, while the control was given the diluent used in the extract. Both treatments were applied locally in the vagina. Length of estrous cycle decreased after the application. No significant changes were recorded in the control group.

- Dirdjosudjono, S., Taroeno, Partini, Fatonati, and M. Murna. 1975. Efek perasan rhizoma temu ireng (*Curcuma aeruginosa*) terhadap ascaris babi dan kontraksi jejunum marmot terpisah. (Effect of the extract of *Curcuma aeruginosa* rhizome against ascaris in pig and on the contraction of isolated jejunum of guinea pigs.) In: "Simposium Penelitian Tumbuhan Obat I," Bogor Agricultural University, Bogor, 8-9 December, 1975. Department of Physiology and Pharmacology, Faculty of Veterinary Science, Bogor Agricultural University, Bogor. pp. 197-208.

Extracts with various concentrations of temu ireng (*Curcuma aeruginosa*) rhizome were prepared from the rhizome without cortex, the pith, the cortex, and skin. The pith extract caused the highest mortality rate of ascaris worms *in vitro*. The LD50 of this extract was 200 times higher than the LD50 of piperazine citrate. When diluted, the extracts had an antagonistic effect on acetylcholine, but the mechanism for this is unclear.

- Dyatmiko, W., S. Oenfinarni, and A. Karim. 1988. Daya antibakteri minyak atsiri *Cubebae fructus* terhadap kuman *Shigella flexneri* dan *Shigella sonnei* secara *in vitro*. (*In-vitro* bactericidal activity of fatty acids from *Piper cubeba* against *Shigella flexneri* and *Shigella sonnei*.) In: "Simposium Penelitian Tumbuhan Obat VI," University of Indonesia-PERHIPBA, Depok, 14-19 November 1988. PERHIPBA, University of Indonesia, Jakarta. pp. 179-180.

*Piper cubeba* is used to treat diarrhea in humans. An *in-vitro* study on its bactericidal activity against *Shigella flexneri* and *Shigella sonnei*, was done using a test-tube dilution test. The minimum inhibitory effects of the acids were at 23.03 mg/ml for *S. flexneri* and 16.05 mg/ml for *S. sonnei*.

- Dyatmiko, W., W.S.H. Hastuti, and B. Subagjo. 1988. Daya antibakteri sari air daun *Stachytarpheta jamaicensis* L. Vahl terhadap *S. pyogenes*, *S. aureus*, dan *E. coli*. (Bactericidal activity of *Stachytarpheta jamaicensis* leaf extract against *S. pyogenes*, *S. aureus* and *E. coli*.) In: "Simposium Penelitian Tumbuhan Obat VI," University of Indonesia-PERHIPBA, Depok, 14-19 November 1988. PERHIPBA, University of Indonesia, Jakarta. pp. 181-182.

*Stachytarpheta jamaicensis* leaves have been used to cure infections of the upper respiratory tract in humans. The bactericidal efficacy of their leaf extract against *Streptococcus pyogenes*, *Staphylococcus aureus*, and *Escherichia coli* was studied using microtitration method. The leaf extract had bactericidal activity against *S. pyogenes*, and *S. aureus* but not *E. coli*.

- Dyatmiko, W., T. Aryani, and B. Subagjo. 1988. Daya antimikroba minyak atsiri dan infus buah *Piper retrofactum* Vahl terhadap kuman *Vibrio cholerae*. (Bactericidal activity of the fatty acids and infusion of *Piper retrofactum* fruit against *Vibrio cholerae*.) In: "Simposium Penelitian Tumbuhan Obat VI," University of Indonesia-PERHIPBA, Depok, 14-19 November 1988. PERHIPBA, University of Indonesia, Jakarta. p. 178.

The bactericidal effect of *Piper retrofactum* oil and infusion against *Vibrio cholerae* were tested using tetracycline as a standard. The antibacterial activities of the oil, infusion and tetracycline in the test-tube dilution test were 26.3 mg/ml, 100 mg/ml and 1.56 mcg/ml.

- He, Simon, S. Tiuria, and E.B. Retnani. 1991. Uji biologis aktivitas anthelmintik sari buah nanas muda, daun miana, dan ranting puring terhadap cacing *Aspicularis tetrapetra* (nematoda) dan *Hymenolepis nana* (cestoda) pada mencit putih (*Mus musculus albinus*). [Study of the biological activity of young pineapple fruit, coleus leaves and croton twigs against *Aspicularis tetrapetra* (nematode) and *Hymenolepis nana* (cestode) in white mice (*Mus musculus albinus*).] Final report. Faculty of Veterinary Science, Bogor Agricultural University, Bogor.

The anthelmintic activity of young pineapple fruit juice and extracts of *Coleus* leaves and *Codiaeum* twigs against mouse pinworm and tapeworm were assayed both *in vitro* and *in vivo*. Young pineapple juice showed activity against both worms *in vitro* but not *in vivo*. Whole extracts of coleus leaves and croton twigs showed no anthelmintic activity against *Aspicularis in vivo* and *in vitro*, but were active against *Hymenolepis* both *in vivo* and *in vitro*. The ED50 of coleus leaf extract against *H. nana* was 0.50 ml of a 1.72% solution in distilled water, while the ED100 was 0.50 ml of a 42% solution in distilled water, given orally once per day for three consecutive days.

The ED50 of croton twig extract was 0.50 ml of an 8.3% solution in distilled water, and the ED100 was 0.50 ml of a 72.5% solution in distilled water, given orally once per day for three consecutive days.

- Ifansyah, N., W. Dyatmiko, and S.A. Idawati. 1988. Pengaruh perasan, infus dan minyak atsiri dari rimpang temu giring terhadap askaris babi secara *in vitro*. (*In-vitro* study on the efficacy of extract, infusion and fatty acids of *Curcuma heyneana* rhizome against *Ascaris* of pigs.) In: "Simposium Penelitian Tumbuhan Obat VI," University of Indonesia-PERHIPBA, Depok, 14-19 November 1988. PERHIPBA, University of Indonesia, Jakarta. pp. 170-171.

Extracts that possibly contained fatty acids were prepared from 60%, 30% and 10% of temu giring (*Curcuma heyneana*) rhizome, while an infusion was prepared from 10% rhizome. An equal concentration of fatty acids was also prepared from the rhizome. *Ascaris* was placed in 250 ml of each solution. Water was used as negative control and piperazine citrate as a positive control. The mortality rate increased with concentration and incubation time.

Iskandar, S.D., S. Karo-Karo, and A. Rissan. 1983. Pengaruh biji pinang (*Areca catechu*) terhadap parasit cacing ternak. (Effect of *Areca catechu* nut against intestinal parasites of livestock.) In: "Simposium Ikatan Sarjana Farmasi Indonesia," 20 -22 Januari 1983, Jakarta. p. 120-122.

The efficacy of *Areca catechu* nut against *Haemonchus* sp., *Oesophagostomum* sp., and *Trichostrongylus* sp. was studied in goats over a two-week period. Fecal egg counts were made before and after the treatment. *Areca catechu* was effective against the nematodes under study, but the effective dose differed for each parasite.

- Karo-Karo, S. 1990. Efektivitas nikotin ekstrak daun tembakau terhadap cacing lambung (*Haemonchus contortus* Rudolphi) pada kambing (*Capra hircus* Linn.). [Efficacy of nicotine extract from tobacco leaves against *Haemonchus contortus* in goats (*Capra hircus* Linn.).] Master's thesis. Bogor Agricultural University, Bogor.

The efficacy of nicotine extract from tobacco leaves against *Haemonchus contortus* was tested in 27 goats. The animals were

divided in 9 groups. One group served as a control, the other eight received between 27.2 mg and 465.8 mg of nicotine extract per animal orally. At a dosage of 310.5 mg/goat or 24.8 mg/kg body weight, the fecal egg count declined by 78%, although the number of parasites remained constant. Dosages below 310.5 mg/goat reduced egg numbers in the feces only by 35.7%, while 465.8 mg/goat produced signs of toxicity.

- Murdiati, T.B. and J. S. Manurung. Forthcoming. Uji daun ketepeng (*Cassia alata* L.) untuk pengobatan penyakit kulit (*Psoroptes cuniculi*) pada kelinci. (Preliminary study on the efficacy of ketepeng leaf (*Cassia alata*) against psoroptic mange (*Psoroptes cuniculi*) in rabbits.) Accepted for publication in Penyakit Hewan. Research Institute for Animal Disease, Bogor.

This study tested the efficacy of ketepeng (*Cassia alata*) leaves for treating skin diseases. Ten New Zealand rabbits, naturally infected with *Psoroptes cuniculi* in both ears, were randomly divided into two groups. One group served as a control. The other was treated weekly with a 50% aqueous suspension of ketepeng leaves. Scabs collected from both ears were investigated for live mites. After four weeks, the number of live mites significantly decreased in the treatment group ( $P < 0.05$ ). The number of scabs in the ears as well as the area infected declined. The results suggest that ketepeng leaves are effective against psoroptic mange in rabbits.

- Mursof, E.P. 1990. Pengendalian *Ascaridia galli* pada ayam petelur dengan getah pepaya (*Carica papaya* Linn.). (Control of *Ascaridia galli* in laying hens with papaya (*Carica papaya*) sap.) Master's thesis. Bogor Agricultural University, Bogor.

The efficacy of papaya sap against *Ascaridia galli* was tested in 15 groups of laying hens. Each group consisted of four 18-week-old animals. The sap was prepared from young papaya fruits. Two groups of chickens were left uninfected. The other groups were artificially infected with *Ascaridia galli*. Two of these did not receive any treatment, while the remaining were orally treated with different dosages of a 20% watery solution. Body weight and egg production in the treatment group increased significantly. Best results were

obtained at a dosage of 1120 mg/animal of the watery solution, while the lethal dosage was higher than 1500 mg/animal.

- Noerdjito, M. 1985. Perlu diungkap lebih lanjut: Ramuan dan khasiat obat tradisional bagi ayam. (It is necessary to intensify the study of traditional remedies for chickens.) In: Proceedings Seminar Peternakan dan Forum Peternakan Unggas dan Aneka Ternak, Ciawi, Bogor, 19-20 Maret, 1985. Puslitbangnak, Bogor. pp. 347-356.

A study was conducted to collect information on traditional medicine used for chickens and the preparation of remedies in villages around Malang, East Java. Most of the ingredients were either spices, such as salt, sugar, and chili (*Capsicum frutescens*), or plants used in traditional human medicines, such as temu ireng (*Curcuma aeruginosa*), kencur (*Kaempferia galanga*), and temu lawak (*Curcuma xanthorrhiza*).

- Nuratmi, B., Sa'Roni, and Y. Astuti. 1988. Pengaruh tanaman duwet (*Eugenia cumini* Linn.) sebagai anti diare pada tikus putih. (The effect of *Eugenia cumini* Linn. on diarrhea in albino rats.) In: "Simposium Penelitian Tumbuhan Obat VI," University of Indonesia-PERHIPBA, Depok, 14-19 November 1988. PERHIPBA, University of Indonesia, Jakarta. p. 61.

Infusions of leaves, seed and bark of duwet (*Eugenia cumini*) were effective against diarrhea in albino rats. The dosages and efficacy were positively correlated. Milled duwet leaves (400 g/100 g body weight!) produced an effect similar to 0.15 mg diphenoxylate per 100 g body weight in rats.

- Pradjongo, T.S., W. Dyatmiko, T. Soemarno, and J.H. Lunday. 1983. Daun katu (*Sauropus androgynus* Merr) terhadap gambaran histologi kelenjar susu mencit betina yang menyusui. (Effect of *Sauropus androgynus* Merr. leaves on the histology of the mammary gland of lactating mice.) In: "Simposium Ikatan Sarjana Farmasi Indonesia," 20 -22 Januari 1983, Jakarta. p. 114.

Katu (*Sauropus androgynus*) leaves have been used to increase milk yield of women who are breast-feeding. A study was carried out using three groups of female mice having their first offspring. One group served as a control. The other two groups received katu infusions at dosages of 0,5 ml and 1,0 ml/25 g body weight for 10 days. At the end of the experiment, the mice were killed and two lobuli from each mammary gland were histologically examined. The results showed that the number of milk producing elements were elevated in the treatment groups.

- Praswanto, N.F.S., B. Dzulkarnain, S. Nurhayati W.H., and W. Yohana. 1988. Pemeriksaan pengaruh rebusan dan ekstrak kulit buah manggis sebagai anti diare pada tikus putih dan pemilihan kadar etanol sebagai cairan penyarinya. (Study on the effect of the extract and juice of the boiled skin of mangosteen fruits against diarrhea and the choice of ethanol level as an extractant.) In: "Simposium Penelitian Tumbuhan Obat VI," University of Indonesia-PERHIPBA, Depok, 14-19 November 1988. PERHIPBA, University of Indonesia, Jakarta. pp. 62-63.

The effect of mangosteen (*Garcinia mangostana*) against diarrhea was studied in albino rats. The boiled fruit skin and an ethanol extract of the fruit skin were effective against diarrhea. This was especially true at a dosage about 100 times the dosage used in humans.

- Soegiharti, S., Jociswati and A. Sardjiman. 1968. Ekstraksi dan daya anthelmintica beserta pengaruh *Cucurbita moschata* Duchesne semen terhadap gastrointestinalis. (Extraction and anthelmintic efficacy of *Cucurbita moschata* Duchesne seeds against gastrointestinal parasites.) Final report. Faculty of Pharmacology, Gadjahmada University, Yogyakarta.

Cucurbitin, the active compound of *Cucurbita moschata* seeds, was isolated. Its efficacy against *Fasciola* from buffaloes and *Haemonchus* from goats was tested *in vitro* and compared to the anthelmintic efficacy of *Cucurbita* seed emulsion. The isolated compound had higher anthelmintic activity than the emulsion.

- Tampubolon, O.T., P. Nurendah, Subanu, B. Dzulkarnain, and Pujarwoto. 1984. Pengaruh ekstrak beberapa tumbuhan obat terhadap bakteri penyebab diare. (The efficacy of some medicinal plant extracts against bacterial diarrhea.) Symposium and Expo of Traditional Medicine of Indonesia, University of Padjadjaran, 29 - 31 January 1984, Bandung. p. 22.

Diarrhea can be caused by bacteria such as *Salmonella typhi*, *E. coli* and *Vibrio cholerae*. Extracts of guava leaves, skin of mangos-teen fruits, tapak liman (*Elephantopus scaber*) leaves and Chinese cabbage were tested *in vitro* for their effect on bacterial diarrhea, using the agar diffusion test (MIC) with tetracycline and chloramphenicol as controls. All plant extracts showed slight inhibition of *Vibrio cholerae*.

## CONCLUSIONS AND RECOMMENDATIONS

Traditional veterinary medicine is used extensively by small ruminant holders in rural Indonesia. However, publications directly addressing this topic are scanty. Many references on human ethnomedicine relating to pharmacology, chemistry, and the production and utilization of medicinal plants may be relevant also to other animals. The publications commonly provide the vernacular and Latin names for each plant, and in some cases also the English name.

Traditional treatments include herbs, ointments, drenches, smoke, and manipulative techniques. They often alleviate symptoms rather than eliminate disease causes. The practices are often interrelated and confounded with religious and cultural beliefs.

Discussions during the workshop revealed the following points:

- **Ethnobotany** investigates plants traditionally used as medicines and in the household. In Indonesia, many such plants have been identified. Lists of these include the plants' local and scientific names, chemical ingredients and pharmacological activities. The Research and Development Centre for Biology's herbarium in Bogor holds an extensive collection of such plants.
- **Local names** for plants may give rise to confusion. Plant names vary from place to place, and different plants may have the same or similar names. Therefore it is important to clearly identify and classify the plants concerned.
- **Some plants** are used to treat a particular disease throughout Java, indicating that these plants may indeed be effective against the disease in question. The efficacy of these and other medicinal plants must be confirmed scientifically.
- **Smallholders** commonly apply traditional veterinary medicines against those diseases that attack their small ruminants most frequently: diarrhea, bloat, gastro-intestinal and external parasites, orf, and eye disease. Research on traditional remedies against these problems should receive high priority.
- The composition of remedies, dosages and preparation methods depend on local conditions and farmers'

knowledge and experience. Farmers learn these remedies from their parents, grandparents, and neighbours

- The economic benefits and costs of traditional medicines should be studied.
- A database of information on traditional remedies should be compiled and updated regularly. This work can be done by RIAD in collaboration with the Center for Research and Development for Biology. The information thereby collected should be distributed through a network.
- Important information sources include:
  - APINMAP (Asia-Pacific Information Network on Medicinal and Aromatic Plants), Bogor
  - Perhiba (Perhimpunan Hidup Baru)
  - APHCA (ASEAN Pharmacological and Health Care Association)
  - PROSEA (Plant Resources of South-East Asia), Bogor
  - Gabungan Pengusaha Jamu Tradisional (Association of Traditional Medicine Businesses)
  - Perkumpulan Pencinta Obat Tradisional (PPOT, Association of Friends of Traditional Medicine)
  - The Agency for Health Research and Development, Ministry of Health, Jakarta
  - The Research Institute for Spices and Medicinal Crops (Balitro) of the Agency for Agricultural Research and Development, Bogor
  - The National Research Committee (NRCC), Jakarta.

## APPENDIX 1

### LIST OF MEDICINAL PLANTS AND THEIR APPLICATION IN SMALL RUMINANTS IN JAVA

The following list summarizes medicinal plants used in Java for small ruminants. It is based on a compilation by Gultom et al. of plants used in Central Java. The editors supplemented this with information from the chapters by Ma'sum, Murdiati, and Sangat-Roemantyo and Riswan in this volume.

The list contains also several plants used for large ruminants. We have included these in view of the similarities in the digestive systems of large and small ruminants.

The plants are listed alphabetically by English name if this is common. Otherwise the Indonesian names are used. In some instances, we have been unable to positively identify the scientific name.

"Plant name"		Part(s)	Usage <sup>2</sup>
Vernacular <sup>1</sup>	Latin		
Adas	<i>Foeniculum vulgare</i>	leaf	appetizer (C), bloat (C)
Arecanut, pinang, jambe (J)	<i>Areca catechu</i>	seed	worms (W, C), diarrhea (W), skin disease (N)
		fruit	worms (E), diarrhea (E)
		leaf	insect repellent (W)
		blossom	lice (E)
		sap	diarrhea (E)

Asam (see tamarind)

<sup>1</sup> English and/or Indonesian, Javanese (J) or Sundanese(S)

<sup>2</sup> (W) = West Java, (C) = Central Java, (E) = East Java, (N) = not specified

Plant name		Part(s)	Usage <sup>2</sup>
Vernacular <sup>1</sup>	Latin		
bambu			retentio (E) worms (C), bleeding after birth (C),
bambu apus	<i>Gigantochloa apus</i>	leaf	diarrhea (C), retentio (E)
Babanjaran	<i>Eupatorium pallescens</i>	leaf	scabies (W)
Banana, pisang	<i>Musa paradisiaca</i>	leaf stem	diarrhea (C) fever (C), appetizer (W, E), diarrhea (E), bloat (E), anemia (E)
		blossom	worms (E), diarrhea (E)
		fruit	diarrhea (E)
pisang batu	<i>Musa balbisiana</i>	fruit	appetizer (W)
Basil, selasih	<i>Ocimum basilicum</i>	seed	diarrhea (C)
Bawang merah (see shallot)			
Bawang putih (see garlic)			
Bangkoang,	<i>Pachyrrhizus erosus</i>	leaf	scabies (C) besusu (J)
Beras (see rice)			

Plant name		Part(s)	Usage <sup>2</sup>
Vernacular <sup>1</sup>	Latin		
Berenuk	<i>Crescentia cujete</i>	leaf	diarrhea (W)
Betle, sirih	<i>Piper betle</i>	leaf	pink eye (C)
Bidara upas	<i>Merremia mammosa</i>	root	milk production (C)
Bratawali	<i>Tinospora crispa</i>	stem	appetizer (C) distomatosis (E)
Cashew nut,	<i>Anacardium occidentale</i>	skin of jambu monyet fruit	worms (C)
Cassava, ketela pohon, singkong	<i>Manihot esculenta</i>	tuber	diarrhea (C), hoof infection (C) scabies (W)
Coconut, kelapa	<i>Cocos nucifera</i>	oil  meal meat water  shell midrib	poisoning (C, E), scabies (C), hoof infection (C) bloat (W, E) scabies (C) worms (E) poisoning (C, E), milk production (C) eye disease (W) hoof infection (C) of leaf milk fever (C)
Coffee, kopi	<i>Coffea sp.</i>	seed	bloat (C, E)
Cogongrass, alang-alang	<i>Imperata cylindrica</i>	root	diarrhea (C)

Plant name		Part(s)	Usage <sup>2</sup>
Vernacular <sup>1</sup>	Latin		
Coriander, ketumbar	<i>Coriandrum sativum</i>	seed	poisoning (C)
Cucumber, ketimun	<i>Cucumis sativus</i>	seed	worms (C, E)
Cumin, jinten	<i>Cuminum cyminum</i>	seed	milk production (C), distomatosis (E)
Dadap ayam	<i>Erythrina orientalis</i>	leaf	diarrhea (W) milk production (C)
Dadap screp	<i>Erythrina subumbrans</i>	leaf, bark	inflammation (E), fever (E)
Duduk	<i>Desmodium triquetrum</i>	leaf	bloat (C)
Galing	<i>Cayratia trifolia</i>	leaf	scabies (E)
Gamal (see <i>Gliricidia</i> )			
Gambas	<i>Luffa cylindrica</i>	seed	influenza (C)
Gambir	<i>Uncaria gambir</i>	fruit	bloat (N), diarrhea (N)
Garlic, bawang putih	<i>Allium sativum</i>	bulb	poisoning (C), bleat (C), worms (E)
Ginger, jahe	<i>Zingiber officinale</i>	rhizome	bloat (C, E), influenza (C)
Gliricidia	<i>Gliricidia sepium</i>	leaf	scabies (W, C)

Plant name		Part(s)	Usage <sup>2</sup>
Vernacular <sup>1</sup>	Latin		
Guava, jambu biji, jambu klutuk (J)	<i>Psidium guajava</i>	leaf	diarrhea (W, C, E), dystocia (C)
		stem	diarrhea (C)
		root	diarrhea (C)
Huni	<i>Antidesma bunius</i>	leaf	diarrhea (W), worms (W)
Jackfruit, nangka	<i>Artocarpus heterophyllus</i>	leaf	diarrhea (C)
		fruit	
		skin	heat stimulant (C)
		tongtolang (young fruit)	diarrhea (W), eye disease (W)
Jahe (see ginger)			
Jambu biji (see guava)			
Jambu monyet (see cashew nut)			
Jenu	<i>Derris elliptica</i>	root	scabies (C)
Jeruk nipis, jeruk pecal (J)	<i>Citrus aurantifolia</i>	fruit	pink eye (C, E), diarrhea (C)
Jinten (see cumin)			
Jinten hitam	<i>Nigella sativa</i>	seed	appetizer (C)
Kacang panjang	<i>Vigna unguiculata</i>	leaf	fattening (E)
Kapok, kapuk, randu (J)	<i>Ceiba pentandra</i>	seed	poisoning (C)
		bark	sprains (C)

Plant name		Part(s)	Usage <sup>2</sup>
Vernacular <sup>1</sup>	Latin		
Katu	<i>Sauropus androgynus</i>	leaf	milk production (C), fever (C)
Kedelai (see soybean)			
Kelapa (see coconut)			
Kencur	<i>Kaempferia galanga</i>	root	bloat (C)
Kentang (see potato)			
Ketapang	<i>Terminalia catappa</i>	leaf	worms (C)
Ketela pohon (see cassava)			
Ketepeng	<i>Cassia alata</i>	leaf	scabies (C)
Ketimun (see cucumber)			
Ketumbar (see coriander)			
Kopi (see coffee)			
Kunci	<i>Boesenbergia pandurata</i>	rhizome	bloat (N), itching (N)
Kunci pepet	<i>Kaempferia angustifolia</i>	rhizome	diarrhea (E)
Kunyit (see turmeric)			
Labu merah	<i>Cucurbita moschata</i>	fruit	worms (N)

Plant name		Part(s)	Usage <sup>2</sup>
Vernacular <sup>1</sup>	Latin		
Lamtoro, mlandingan (J)	<i>Leucaena leucocephala</i>	leaf seed	scabies (C) worms (C), appetizer (C)
Langkuas	<i>Languas galanga</i>	rhizome	appetizer (W), worms (W)
Lawatan (scientific name unknown)		leaf	milk production (C)
Lemongrass, serch	<i>Cymbopogon nardus</i>	leaf	appetizer (W)
Lempuyang	<i>Zingiber zerumbet</i>	rhizome  rhizome	raise fertility (C), appetizer (W, E), diarrhea (E) appetizer (W), worms (W)
Mahogany, mahoni mauni (J)	<i>Swietenia mahagoni</i>	seed	influenza (C), skin disease (E)
Mangkokan	<i>Polycias scutellarium</i>	leaf	papilloma (E)
Mango, mangga	<i>Mangifera indica</i>	leaf	diarrhea (C)
Maringgo	<i>Moringa oleifera</i>	leaf	scabies (C)
Mengkudu, pace (J)	<i>Morinda citrifolia</i>	fruit  leaf	appetizer (E), worms (N) scabies (E)

Plant name Vernacular <sup>1</sup>	Latin	Part(s)	Usage <sup>2</sup>
Merica (see pepper)			
Mindi	<i>Melia azedarach</i>	leaf	scabies (C, E)
Nangka (see jackfruit)			
Nenas (see pineapple)			
Papaya, pepaya, kates (J)	<i>Carica papaya</i>	leaf latex fruit stalk of leaf	bloat (C), diarrhea (W, C), appetizer (C), worms (C) worms (N) poisoning (C) bloat (W, C, E)
Paria	<i>Momordica charantia</i>	leaf	worms (N)
Patik mas (scientific name unknown)		leaf	constipation (E)
Pepper, merica	<i>Piper nigrum</i>	seeds	worms (N), tonic (N)
Pisang (see arecanut)			
Pineapple, nenas	<i>Ananas comosus</i>	fruit	worms (C)
Pisang (see banana)			
Potato, kentang	<i>Solanum tuberosum</i>	tuber	diarrhea (W)
Pulai	<i>Alstonia scholaris</i>	bark	fattening (E)

Plant name		Part(s)	Usage <sup>2</sup>
Vernacular <sup>1</sup>	Latin		
Pule pandak	<i>Rauvolfia serpentina</i>	root	fever (C)
Pulo waras	<i>Alyxia reinwardtii</i>	bark	raise fertility (C)
Puring	<i>Codiaeum variegatum</i>	leaf	worms (N)
Raja gowah	<i>Catimbum malaccensis</i>	rhizome	diarrhea (W)
Rice, beras	<i>Oryza sativa</i>	seeds	diarrhea (N)
Saga	<i>Abrus precatorius</i>	leaf	milk production
Salam	<i>Syzygium polyanthum</i>	leaf, bark	diarrhea (C)
Sawo	<i>Manilkara kauki</i>	leaf, flower	diarrhea (N)
Selasih (see basil)			
Sembukan	<i>Paederia foetida</i>	leaf	appetizer (E), bloat (E) milk production (C)
Sembung	<i>Blumea balsamifera</i>	root	appetizer (C)
Sereh (see lemongrass)			
Scruni	<i>Spilanthes acmella</i>	flower	fever (C)
Scrut	<i>Streblus asper</i>	leaf	diarrhea (C)

Plant name		Part(s)	Usage <sup>2</sup>
Vernacular <sup>1</sup>	Latin		
Shallot, bawang merah	<i>Allium cepa</i>	bulb	poisoning (C), bloat (C), diarrhea (N)
Singkong (see cassava)			
Sidomolo	<i>Artemisia vulgaris</i>	leaf	diarrhea (C), worms (C)
Sirih (see betle)			
Somjawa, tleso (J)	<i>Talinum paniculatum</i>	leaf	sprains (C)
Soursop, sirsak	<i>Annona muricata</i>	fruit	lice (E)
Soybean, kedelai	<i>Glycine soja</i>	meal	poisoning (C)
Sugarcane, tebu	<i>Saccharum officinarum</i>	leaf	dystocia (C)
Tamarind, asam	<i>Tamarindus indica</i>	fruit	appetizer (W), fattening (E), milk production (E), diarrhea (E), bloat (E), poisoning (E), mastitis (E), purgative (N), skin disease (N)
<i>sinom</i>		young leaf	appetizer (E)

Plant name		Part(s)	Usage <sup>2</sup>
Vernacular <sup>1</sup>	Latin		
Tea, teh	<i>Camellia sinensis</i>	leaf	diarrhea (C)
Tembelekan	<i>Lantana camara</i>	herb	scabies (N)
Temu giring	<i>Curcuma heyneana</i>	rhizome	worms (N)
Temu hitam, temu ireng (J)	<i>Curcuma aeruginosa</i>	rhizome	bloat (C), fever (C), worms (C, E) distomatosis (E)
Temu lawak	<i>Curcuma xanthorrhiza</i>	rhizome	diarrhea (C), raise fertility (C), appetizer (C, E) worms (N), anemia (N)
Tobacco, tembakau, mbako (J)	<i>Nicotiana tabacum</i>	leaf	scabies (C), hoof infections , myiasis (C, E), worms (C)
Tongtolang (see jackfruit)			
Turmeric, kunyit	<i>Curcuma domestica</i>		rhizome diarrhea (W, C), raise fertility (C), appetizer (W), milk production (E), chronic wounds (E), retentio (E)
Turmeric		leaf	appetizer (W), worms (W)

Plant name		Part(s)	Usage <sup>2</sup>
Vernacular <sup>1</sup>	Latin		
Waru	<i>Hibiscus tiliaceus</i>	leaf	milk production (C), worms (C), diarrhea (C), retentio (E)
		bark	broken leg
Wera	<i>Hibiscus rosasinensis</i>	leaf	eye disease (W)

## **APPENDIX 2**

### **PARTICIPATING INSTITUTIONS AND SCIENTISTS**

1. **Central Research Institute for Animal Science (CRIAS)**  
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**Ir. Bess Tiesnamurti, MSc.**  
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4. **Research Institute for Animal Disease (RIAD)**  
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