

TRADITIONAL VETERINARY MEDICINE FOR SMALL RUMINANTS IN JAVA

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BIBLIOGRAPHY ON TRADITIONAL VETERINARY MEDICINE IN INDONESIA

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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-bangnak, 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 *Aspiculuris 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 *Aspiculuris 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 *Aspiculuris* *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.P.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 mangosteen 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*.