

Hijauan Pakan Mengandung Tannin Sebagai Anthelmintik Alami

(*Tannin Containing Forage as Natural Anthelmetic*)

J. Daryatmo*

ABSTRACT

Haemonchiasis is one of the problems of livestock production, particularly in tropical areas. The increasing occurrence of anthelmintic resistance and the lack of development of new anthelmintics suggest that tanniniferous plants could be considered as a potential strategic alternative for the control of nematodes infection in small ruminants (Akkari et al., 2008). Anthelmintic drugs, has led to greatly increased prevalence of anthelmintic resistance in goats (Mortensen et al., 2003). A number of chemicals had been effectively controlling the worms, but increasing prevalence of anthelmintic resistance in nematodes in domestic ruminants (Waller, 2001). Traditional veterinary practices continue to play important roles in livestock health and their management feeding system, as it related to the use of the medicinal plants in treating various ailments. This move is in response to the production of animals free from industrial chemical inputs and the need to discover new therapeutic substances of natural origin with possibly low toxicity to man and animals (Alawa et al., 2003). Tannins containing plants have been reported to reduce worm burden. This paper reviews some studies on the anthelmintic effects of tannins contain in tanniniferous plants.

Key Words: Anthelmintics; Forages; Tannins

*Staf Pengajar Sekolah Tinggi Penyuluhan Pertanian (STPP) Magelang

DAFTAR PUSTAKA

- Aas, E. 2003. A practitioners perspectives: traditional tannin-treatment against intestinal parasites in sheep and cattle. *J. Ethnobotany Res. Appl.* 1: 31-37
- Akhtar MS and Ahmad I. 1992. Comparative efficacy of *Mallotus philippinensis* fruit (Kamala) or Nilzan drug against gastrointestinal cestodes in Beetal goats. *J. Small Rum. Res.* 8: 121–128.
- Ahmad, R.Z. 2005. Pemanfaatan cendawan *arthrobotrys oligospora* dan *duddingtonia flagrans* untuk pengendalian *haemonchosis* pada ruminansia kecil di Indonesia. *J. Litbang Pertanian* 24 : 4.
- Akkari, H., M.A. Darghouth, and H.B. Salem. 2008. Preliminary investigations of the anti-nematode activity of *Acacia cyanophylla* Lindl.: Excretion og gastrointestinal nematode eggs in lambs browsing *A. cyanophylla* with and without PEG or grazing native grass. *J. Small Rum Res.* 74: 78-83.
- Alawa, C.B.I., A.M. Adamu, J. O. Gefu, , O.J. Ajanusi, P.A. Abdu, N.P. Chiezey, J. N. Alawa and D.D. Bowman. 2003. In vitro screening of two Nigerian medicinal plants (*Vernonia amygdalina* and *Annona senegalensis*) for anthelmintic activity. *J. Vet. Parasitol.* 113: 73-81.
- Anonim. 2000b. *Parasites Diagnosis*. Langston University Agricultural Research and Extension Programs. Langston.
<http://www.luresext.edu/goats/library/fec12.html>. Diakses tanggal 05 Januari 2010
- Athanasiadou, S., I. Kyriazakis, F. Jackson, and R.L. Coop. 2001. Direct anthelmintic effects of condensed tannins towards different gastrointestinal nematodes of sheep: *in vitro* and *in vivo* studies. *J. Vet. Parasitol.* 99: 205-219.
- Bachaya, H.A. 2007. Screening of some indigenous plants for anthelmintic activity with particular reference to their condensed tannin content. *PhD Thesis*. Faculty of Veterinary Science. University of Agriculture Faisalabad. Pakistan.
- Barry, T.N. 1985. The role of condensed tannin in nutritional value of *Lotus pedunculatus* for sheep 3. Rates of body and wool growth. *Br. J. Nutr.* 54 (1): 211–217.
- Barry, T. N. and W.C. McNabb. 1999. The effect of condensed tannins in temperate forages on animal nutrition and productivity. Tannins in Livestock and Human Nutrition. *ACIAR Proceedings* 92: 30–35.
- Beriajaya, S.E., Estuning Darmono, M.R. Knox, D.R. Stoltz, and A.J. Wilson. 1995. The use of wormolas in controlling gastrointestinal nematode infections in sheep under traditional grazing management in Indonesia. *J. Ilmu ternak dan Veteriner* 1 (1) : 49-55.
- Bown, M.D., D.P. Poppi and A.R. Sykes. 1986. The effect of post-ruminal infusion of protein or energy on the pathology of *Trichostrongylus colubriformis* infection and body composition in lambs. *Aust. J. Agric. Res.* 42(2): 253–267.

- Brotowijoyo, M.D., 1987. *Parasit dan Parasitisme*. Edisi Pertama. Media Sarana Press. Jakarta.
- Cenci, F.B., H. Louvandini, C.M. McManus, A. Dell'Porto, D.M. Costa, S.C. Araujo, A.P. Minho and A.L. Abdalla. 2007. Effects of condensed tannin from *Acacia mearnsii* on sheep infected naturally with gastrointestinal helminthes. *J. Vet. Parasitol.* 144: 132-137.
- Chafton, L.A. 2006. The effect of a condensed tannin containing forage, *Sericea lespedeza*, on existing and challenge infections of *Haemonchus contortus* in sheep. *PhD Thesis*. Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College. Louisiana.
- Chandrawathani, P., M. Adnan, and P.J. Waller. 1999. Anthelmintic Resistance in sheep and goat farms on Peninsular Malaysia. *J. Vet. Parasitol.* 82 (4): 305-310.
- Cheeke, P.R. and L.R. Shull. 1985. *Natural Toxicants in Feed and Poisonous Plants*. AVI Publishing Company. Wesport. Connecticut.
- Coffey, L., M. Hale, T. Terril, J. Mosjidis, J. Miller and J. Burke. 2007. *Tools for Managing Internal Parasites in Small Ruminants: Sericea Lespedeza*. NCAT Agriculture Specialists and Southern Consortium for Small Ruminant Parasite Control. http://attra.ncat.org/attra-pub/sericea_lespedeza.html. Diakses tanggal 23 Januari 2008.
- Coop, R.L. and P.H Holmes. 1996. Nutrition and parasite interaction. *Int. J. Parasitol.* 26: 951–962.
- Cresswell, K.J. 2007. Anthelmintic effects of tropical shrub legumes in ruminant animals. *PhD Thesis*. The Australian Institute of Tropical Veterinary and Animal Science School of Veterinary and Biomedical Sciences. James Cook University. Australia.
- Fleming, S.A., T. Craig, R.M. Kaplan, J.E. Miller, C. Navarre, and M. Rings. 2006. Anthelmintic resistance of gastrointestinal parasites in small ruminants. *J. Vet. Intern. Med.* 20: 435–444.
- Food and Agriculture Organization of the United Nations (FAO). 1999. Livestock statistics. <http://apps.fao.org/cgi-bin/nph-db>. Diakses tanggal 28 Juli 2010.
- Guarrera, P.M. 1999. Traditional antihelminthic, antiparasitic and repellent uses of plants in Central Italy. *J. of Ethnopharmacol.* 68: 183–192.
- Hadi, S.M., S.H. Bhat, A.S. Azmi, S. Hanif, U. Shamim and M.F. Ullah. 2007. Review. Oxidative breakage of cellular DNA by plant polyphenols: A putative mechanism for anticancer properties. *Seminars in Cancer Biology October 2007* 17(5): 370-376
- Heckendorf, F., D. A. Haring, V. Maurer, M. Senn and H. Hertzberg. 2007. Individual administration of three tanniferous forage plants to lambs artificially infected with *Haemonchus contortus* and *Cooperia curticei*. *J. Vet. Parasitol.* 146: 123–134.

- Hoste, H., J.F. Torres-Acosta, V. Paolini, A. Aguilar-Caballero, E. Etter, Y. Lefrileux, C. Chartier and C. Broqua. 2005. Interactions between nutrition and gastrointestinal infections with parasitic nematodes in goats. *J. Small Rum. Res.* 60: 141-151.
- Ibrahim, A.M. 1992. Anthelmintic activity of some Sudanese anthelmintic plants. *J. Phytotherapy Res.* 6: 155-157.
- Iqbal, Z., M. Sarwar, A. Jabbar, S. Ahmed, M. Nisa, M.S. Sajid, M.N. Khan, K.A. Mufti and M. Yaseen. 2007. Direct and indirect anthelmintic effects of condensed tannin in sheep. *J. Vet. Parasitol.* 144: 125-131.
- Jog, P and K. Shah. 2006. *Anthelmintics – rational use*. National Conference of Pediatric Infectious Diseases, Chennai.
http://www.pediatriconcall.com/fordoctor/Conference_abstracts/NCPID2006/Article5.asp. Diakses tanggal 14 Desember 2008.
- Jones G.A., T.A. McAllister, A.D. Muir and K.J. Cheng. 1994. Effects of sainfoin (*Onobrychis viciifolia* Scop.) condensed tannins on growth and proteolysis by four strains of ruminal bacteria. *J. Appl. Environ. Microbiol.* 60: 1374-1378.
- Julien, J., M. Gasquet, C. Maillard, G. Balansard and P. T. David. 1985. Extracts of the ivy plant, *Hedera helix*, and their anthelmintic activity on liver flukes. *Plant Medica* 3: 205–208.
- Kahiya, C., S. Mukaratirwa and S.M. Thamsborg. 2003. Effect of *Acacia nilotica* and *Acacia karo* diets on *Haemonchus contortus* infection in goats. *J. Vet. Parasitol.* 155: 265-274.
- Khariri. 2005. Prevalensi helmintiasis pada ternak kambing di desa Nglipar Lor, Nglipar, Gunung Kidul, Daerah Istimewa Yogyakarta. *Skripsi*. Fakultas Kedokteran Hewan. Universitas Gadjah Mada. Yogyakarta.
- Kusumamihardja, S. Tanpa tahun. *Parasit Dan Parasitosis Pada Hewan Ternak Dan Hewan Piaraan Di Indonesia*. Pusat Antar Universitas Bioteknologi. Institut Pertanian Bogor.
- Lange, K.C, D.D. Olcott, J.E. Miller, J.A. Mosjidis, T.H. Terrill, J.M. Burke and M.T. Kearney. 2006. Effect of sericea lespedeza (*Lespedeza cuneata*) fed as hay, on natural and experimental *Haemonchuscontortus* infections in lambs. *J. Vet. Parasitol.* 141: 273–278.
- Larsen, M. 2000. Prospects for controlling animal parasitic nematodes by predacious micro fungi. *J. Parasitol.* 120: 121–131.
- Lastuti, N.D.R., Mufasirin dan I.S. Hamid. 2006. Deteksi protein *Haemonchus sp* pada domba dan kambing dengan uji Dot Blot menggunakan antibodi poliklonal protein ekskresi dan sekresi *Haemonchus contortus*. *Media Kedokteran Hewan* 22 (3): 162-167
- Levine, N.D. 1994. *Parasitologi Veteriner*. Gadjah Mada University Press. Yogyakarta.

- Lopez, J., O.F. Ibarra, G.J. Canto, C.G. Vasquez, Z.I. Tejada and A. Shimada. 2005. *In vitro* effect of condensed tannins from tropical fodder crops against eggs and larvae of the nematode *Haemonchus contortus*. *J. Food Agric. Environ.* 3 (2): 191-194.
- McLeod, R.S. 2004. The economic impact of worm infections in small ruminants in Southeast Asia, India and Australia in: Worm Control for Small Ruminants in Tropical Asia. *ACIAR Monograph* 113: 23-33.
- Min, B.R. and S.P. Hart. 2003. Tannins for suppression of internal parasites. *J. Anim. Sci.* 81(2): 102-109.
- Min, B.R., W.E. Pomroy, S.P. Hort and T. Sahlu. 2004. The effect of short-term consumption of a forage containing condensed tannins on gastro-intestinal nematode parasitic infections in grazing wether goats. *J. Small Rum. Res.* 51: 279-283.
- Min, B.R., S.P. Hart, D. Miller, G.M. Tomita, E. Loetz and T. Sahlu. 2005. The effect of grazing forage containing condensed tannins on gastro-intestinal parasite infection and milk composition in Angora does. *J. Vet. Parasitol.* 130: 105–113.
- Minho, A.P., I.C.S. Bueno, H. Louvandini, F. Jackson, S.M. Gennari, and A.L. Abdalla. 2007. Effect of *Acacia molissima* tannin extract on the control of gastrointestinal parasites in sheep. *J. Anim. Feed Sci. Technol.* doi:10.1016/j.anifeedsci.2007.09.016. Diakses tanggal 20 Pebruari 2010.
- Mohamed A.S.A., T. Mori, S.Q. Islam, M. Sato and T. Yamasaki. 2000. Lethal activity of condensed tannins against the free-living soil-inhabiting nematode *Caenorhabditis elegans*. *J. Pesticide Sci.* 25: 410–415.
- Mortensen, L.L., L.H. Williamson, T.H. Terrill, R.A. Kircher, M. Larsen and R.M. Kaplan. 2003. *Evaluation of prevalence and clinical implications of anthelmintic resistance in GIN in goats*. *JAVMA* 223: 495-500.
- Mustika, I., R.Z. Ahmad. 2004. Peluang pemanfaatan jamur nematofagus untuk mengendalikan nematoda parasis pada tanaman dan ternak. *J. Litbang. Pertan.* 23 (4): 115-122.
- Nguyen, T.M, V.B. Dinh, E.R. Ørskov, J.D. Brooker dan T. Acamovic. 2005. Effect of foliages containing condensed tannins and on gastrointestinal parasites. *J. Anim. Feed Sci. Technol.* 121: 77-87.
- Niezen, J.H., T.S. Waghorn, W.A.G. Charleston and G.C. Waghorn. 1995. Growth and gastrointestinal parasitism in lambs grazing on of seven herbages and dosed with larvae for six weeks. *J. Agric. Sci. Camb.* 125: 281–289.
- Niezen, J.H., W.A.G. Charleston, J. Hodgson, C.M. Miller, T.S. Waghorn and H.A. Robertson. 1998. Effect of plant species on the larvae of gastrointestinal nematodes which parasitise sheep. *Int. J. Parasitol.* 28 (5): 791–803.

- Norton, B.W. and J.H. Ahn. 1997. A comparison of fresh and dried *Calliandra calothyrsus* supplements for sheep given basal diet of barley straw. *J. Agric. Sci. Camb.* 129(4): 485–494.
- Norton, B.W. 1999. The Significance of Tannins in Tropical Animal Production. Tannins in Livestock and Human Nutrition. *ACIAR Proceedings* 92: 14-23
- Nugrahati, I.C. 2002. Efek Anthelmintik Infusa rimpang temu giring 5% dan 2,5% terhadap cacing *Ascaridia galli* secara *in vivo* pada ayam pedaging. *Skripsi*. Fakultas Kedokteran Hewan. Universitas Gadjah Mada. Yogyakarta.
- Paolini, V., J.P. Bergeaud, C. Grisez, F. Prevot, P.H. Dorchies and H. Hoste. 2003. Effects of condensed tannins on goats experimentally infected with *Haemonchus contortus*. *J. Vet. Parasitol.* 113: 253–261.
- Pritchard, D.A., D.C. Stock, B.M. O'Sullivan, P.R. Martin, I.S. Hurwood and P.K. O'Rourke. 1988. The effect of polyethylene glycol (PEG) on wool and liveweight of sheep consuming mulga (*Acacia aneura*) diet. *Proc. Aust. Soc. Anim. Prod.* 17: 290-293.
- Ridwan, Y., S. Kusumamihardja, P. Dorny, and J. Vercruyse. 1996. The Epidemiology of Gastro-intestinal nematodes of sheep in West Java Indonesia. *Hemerazoa* 78: 8–18.
- Rochfort, S., A.J. Parker and F.R. Dunshea. 2008. Plant bioactives for ruminant health and productivity. *J. Phytochem.* 69: 299–322.
- Satou, T., N. Akao, R. Matsuhashi, K. Koike, K. Fujita and T. Nikaido. 2002. Inhibitory effect of isoquinoline alkaloids on movement of second-stage larvae of *Toxocara canis*. *Biological and Pharmaceutical Bulletin* 25: 1651–1654.
- Shaik, S.A., T.H. Terrill, J.E. Miller, B. Kouakou, G. Kannan, R.K. Kallu and J.A. Mosjidis. 2006. Effects of feeding *Sericea lespedeza* hay to goats infected with *Haemonchus contortus*. *South African J. Anim. Sci.* 34 (1): 248-250.
- Sokarya, S and T.R. Preston. 2003. Effect of grass or cassava foliage on growth and nematode parasite infestation in goats fed low or high protein diets in confinement. *J. Livest. Res. Rural Dev.* 15 (8). http://www.smallstock.info/reference/LRRD/2003_15_8_kery158.pdf
- Soulsby, E.J.L. 1986. *Helminths Arthropods and Protozoa of Domesticated Animals*. 7th ed. Bailliere Tindall. London.
- Subandriyo, T. Sartika, Suhardono and G.D. Gray. 2004. Worm control for small ruminants in Indonesia dalam *Worm Control for Small Ruminants in Tropical Asia: ACIAR Monograph* 113: 151-188
- Subronto dan I. Tjahajati. 2004. *Ilmu Penyakit Ternak II*. Gadjah Mada University Press. Yogyakarta.
- Suweta, I.G.P. 1989. Review on important helminthic diseases in animal in Indonesia. *Buletin Penelitian Kesehatan* 17 (2) : 34-43.

- Terrill, T.H., G.H. Douglas, A.G. Foote, R.W. Purchas, G.F. Wilson and T.N. Barry. 1992. Effect of condensed tannins upon body growth and rumen metabolism in sheep grazing *Hedysarum coronarium* and perennial pasture. *J. Agric. Sci.* 119: 265-273.
- Uswatianasari, Y. 2005. Prevalensi telur strongil dari nematoda gastrointestinal pada kambing dan domba di Kabupaten Sleman. *Skripsi*. Fakultas Kedokteran Hewan. Universitas Gadjah Mada. Yogyakarta.
- van Wyk, J.A., F.S. Malan, L.J. van Rensburg, P.T. Oberem and M.J. Allan. 1997. Quality control in generic anthelmintics: Is it adequate?. *J. Vet. Parasitol.* 72 (2): 157-165.
- Waghorn, G.C., 1990. Effects of condensed tannins on protein digestion and nutritive value of fresh herbage. *Proc. Aust. Soc. Anim. Prod.* 18: 412–415.
- Waller, P.J., G. Bernes, S.M. Thamsborg, A. Sukura, S.H. Richter, K. Ingebrigtsen and J. Höglund. 2001. Plants as De-Worming Agents of Livestock in the Nordic Countries: Historical Perspective, Popular Beliefs and Prospects for the Future. *J. Acta Vet. Scand.* 42 (1): 31-44.
- Wang, Y., G.B. Douglas, G.C. Waghorn, T.N. Barry and G.F. Wilson. 1996. Effects of condensed tannins in *Lotus corniculatus* upon lactation performance in ewes. *J. Agric. Sci. Camb.* 126 (3): 353–362.
- Widayat. 2006. Prevalensi nematoda gastrointestinal pada kambing di kelompok ternak Kwarasan Wetan Kabupaten Gunung Kidul. *Skripsi*. Fakultas Kedokteran Hewan. Universitas Gadjah Mada. Yogyakarta.
- Zajac, A. 1995. *Goat Parasites and Their Control*. Meat Goat Program Virginia State University. <http://university.uog.edu/cals/people/Pubs/Goats/zajac95.pdf>. Diakses tanggal 1 Februari 2010.