PRELIMINARY SURVEY VISIT

AREA V
RESEARCH

C. IMPLEMENTATION, MONITORING, EVALUATION AND UTILIZATION OF RESEARCH RESULTS/OUTPUTS

C.5. Evidence/s that Research Results have Been Utilized

CERTIFICATE OF UTILIZATION

This is to certify that the Utility Model titled **"FORMULATION OF AZOLLA LEAF MEAL AS FEED ADDITIVE FOR NATIVE CHICKENS"**, developed by **JOSEPHINE R. FLORES**, from University of Southern Mindanao, has officially been utilized, in alignment with its intended purpose.

We acknowledge and appreciate the contribution of the developers in the development of this utility model and recognize its value.

Issued on September 8, 2025 at the College of Veterinary Medicine, University of Southern Mindanao, Kabacan, Cotabato, Philippines.

DR. PRECIOUS AMOR BESO-FERRER
Owner, Beso Poultry Farm
Purok Beso, Barangay Buenaflor
Tacurong City, Sultan Kudarat

CERTIFICATE OF REGISTRATION
UTILITY MODEL

REGISTRATION NO. 2/2021/050826

Having complied with the provisions of Republic Act No. 8293 and its regulations, this Office certifies that this Registration with the following particulars was registered on **23 March 2022** with a term until **16 July 2028**, unless otherwise earlier cancelled.

This registration grants the registrant the right to restrain, prohibit any unauthorized person or entity from making, using, offering for sale, selling or importing a product (if a registered product) and importing any product obtained directly or indirectly from such process (if a registered process).

Registrant:
UNIVERSITY OF SOUTHERN MINDANAO [Kabacan, Cotabato (North Cotabato), PH]

Title of the Utility Model:
PROCESS OF PRODUCING MOLASSES MINERAL SALT BLOCK FORTIFIED WITH TUBLI (Derris elliptica) ROOT POWDER

Makers:
LUMBAO, Lilian A. [Kabacan, Cotabato (North Cotabato), PH]

Publication Date:
23 March 2022

for: Rosa A. Fabian
Atty. LOLIBETH R. MEDRANO
Director of Patents

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Bureau of Patents

Gawad Likha

is awarded to

Josephine R. Flores

for demonstrating exceptional commitment to research through the generation and utilization of intellectual property assets in the year 2023.

Given this 27th day of September 2024.

Formulation of feed Additives using Azolla for Native Chicken
22021050823

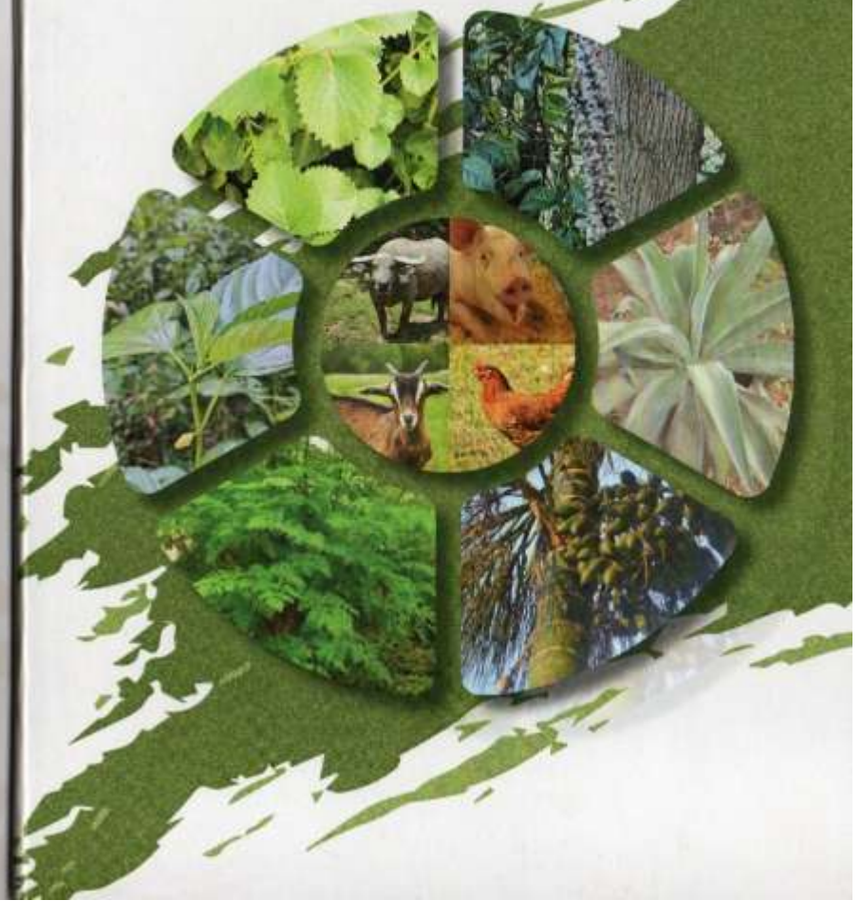
Formulation of Betel Nut Capsule as Anti-helmintic for Goats
22021050893

Francisco G. N. Garcia, PhD
SUC President IV
University of Southern Mindanao

BACONG PILIPINAS

COMPENDIUM

of Ethnoveterinary Therapies for Control of Internal Parasites in Livestock



Republic of the Philippines
University of Southern Mindanao
Kabacan, Cotabato

Vision

Quality and relevant education for its clientele to be globally competitive, culture sensitive and morally-responsive human resources for sustainable development.

Mission

To accelerate the socio-economic development, promote harmony among diverse communities in Southern Philippines, and improve the quality of life through instruction, research, extension and production.

ACKNOWLEDGMENT

The production of this compendium is supported by the University of Southern Mindanao. All sources of data and information integrated in this handbook are hereby acknowledged.

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Jatropha curcas

Jatropha curcas

Jatropha curcas

Common Names

Tuba-Tuba; Tubang-bakod; Sambo; Tagumbao; Kasla; Tangantangan; Physic Nut

Description

Jatropha curcas is a species of flowering plant belonging to the family Euphorbiaceae, that is native to the American tropics, such as Mexico and Central America (Janick and Pauli, 2008). It has spread to other regions in the world and has become naturalized in many areas (Cabi.org). The plant is found throughout the Philippines (http://mixph.com/2007/08)growing-jatropha-tuba-tuba.html). Retrieved May 23, 2023.

Anthelmintic benefit

In vitro killing of adult *Trichostrongylus spp.* by 40%, 50%, 60% and 70% concentrations of a methanolic extract from *J. curcas* leaves. The 40% concentration had killed adult worms after 12 hours of incubation; the 50% and 60% on the 9th hour; and the 70% on the 12th hour (Fugata, 2009).

In vitro effects of 40, 50, 60 and 70 percent leaf extract were demonstrated on eggs of *Trichostrongylus spp.* through inhibition of the hatching of eggs of the worms after 48 hours of incubation (Fugata, 2009).

Saluyot
Saluyot
Saluyot

Common Names

Saluyot; Pasau-na-bilog; Egyptian spinach; Indian jute; wild jute; bush okra

Description

Corchorus olitorius is a year-round growing herb in the Family Malvaceae. The plant is a green leafy, and flower-bearing. It is natural to the tropical and subtropical regions throughout the world (Wikipedia). It has a height of 1-1.5 meters, heavily projected branches, and partly woody shrub. The leaves are ovate-lanceolate, glossy, dark green up to 5-15 cm long with finely serrated margins. The flower is small (2-3 cm in diameter), has no stalk attached at the junction of the leaves, solitary, and yellow-colored with five petals fruits that are 3 cm long and 1-2 cm in diameter, which enclose seeds (http://www.stuartxchange.com/Pasau.html).

Anthelmintic benefit

In vitro killing of adult *Hemonchus contortus* (abomasal worm): methanolic extract from unripe fruits and seeds at 70%, 80%, 90%, and 100% concentrations had killed adult worms. The 100% concentration had caused 100% mortality after 15 hours of incubation while the 70%, 80% and 90% had killed adult worms after 18 hours of incubation.

Egg hatch assay: All the concentrations had inhibited the hatching of eggs of *H. contortus*. The 100% and 90% concentrations had significantly similar number of eggs that were inhibited. The 70% and 80% concentrations had also inhibited the hatching of eggs, with the number of inhibited eggs significantly higher than the number of inhibited eggs observed in the negative control (distilled water) (Adamat , 2009).

Oreganum vulgare

Oreganum vulgare

Oreganum vulgare

Common Names

Origanum; Wild marjoram

Description

Oregano is an aromatic perennial herb of the mint family. Its leaves are compact and oval and arranged opposite each other. They are covered with glandular trichomes (plant hairs). The stems, when young, are typically square and hairy, and when these age, they become woody. Oregano flowers are small and are in clusters, and range from white to pink or pale purple in color (https://www.britannica.com/plant/oregano - retrieved March 31, 2023.

Anthelmintic benefit

Oregano oil extracted from the leaves and administered at a dose of 600 mg/kg body weight to goats naturally infected with common gastro-intestinal nematodes orally. A reduction in fecal egg counts of up to 74. 69% on the 3rd week after a single treatment was observed. The efficacy of the oregano was comparable with that of levamisole as positive control (Abrenica, 2020).

NEEM

NEEM

NEEM

Common Names

margosa, neem, nimtree or Indian lilac

Description

Neem trees are attractive broad-leaved evergreens that can grow up to 30 m tall and 2.5 m in girth. Their spreading branches form rounded crowns as much as 20 m across (https://www.britannica.com/plant/neem-tree). Retrieved May 23, 2023.

Anthelmintic benefit

A 150 ml neem tree leaf extract showed an efficacy of 62.10% in reducing fecal egg counts in goats naturally infected with trichostrongylid nematode. This was comparable to the efficacy of ivermectin (73.82%). At post –mortem examination of the treated goats, no worms were observed in those goats given 150 ml of neem leaf extract (Octavio, 2019).

Ipil-Ipil

Ipil-Ipil

Ipil-Ipil

Common Names

Lead Tree, Reuse Wattel, White Popinac, Horse Tamarind, Wild Tamarind, Leucaena, Jumbie Bean, Jumbay, Ipil-ipil, Petai Jawa

Description

Ipil-ipil belongs to the Leguminosae family, one of the fastest-growing leguminous trees. It contains a percentage of protein and vitamin A (https://www.google.com/search?q=ipil+description&oq=ipil+description+&aqs=chrome). Retrieved May 26, 2023.

Anthelmintic benefit

A 150 mg/kg BW concentration of leaf crude extract given at 0, 7, 14 and 21 days of the experiment had reduced the fecal egg counts to as much as 93.44% in goats naturally infected with trichostrongylid nematodes (Dandal, 2021).

COMBINED KAKAWATE SALUYOT AND TUBA-TUBA

Description

Tuba- tuba- is an erect, branched shrub usually less than one meter high.

Madre de Cacao does not become very tall, ranging in height from 6-33 ft. It has a smooth trunk, with whitish to gray-brown coloration.

Saluyot is famous for its sturdy, natural fiber but there are cultivars that are grown as a leafy vegetable. The young leaves are used fresh or dried.

Anthelmintic benefit

Combined ethanolic extract (100% kakawate, 100% saluyot and 100% tuba-tuba seeds) at a dose of 12 kg body weight administered to goats naturally infected with common gastrointestinal nematodes once orally. A reduction in fecal egg counts of up to 61.75% on day 7 after treatment was observed (Aballe , 2013).

KULITIS

KULITIS

KULITIS

Common Names

Amaranth, Chinese spinach, Tampala, Pigweed, Kulitis, Uray and Kudjapa

Description

Spinach is a herbaceous plant whose leaves, green and arranged in rosette, are eaten raw or cooked. The leaves have an oval shape and are wrinkled; they can be whole or sawed. It is a very nutritious, tasteful and easy-to-digest plant (https://iveg.pcaarrd.dost.gov.ph/resource/journal/BPIKulitis). Retrieved May 7, 2023.

Anthelmintic benefit

Spinach pure extract administered at a dose of 100 mg/kg body weight to goats naturally infected with common nematodes once orally had reduced the fecal egg counts of the parasites in goats up to 86.20% on day 14 after a single dose (Viado, 2013).

Mango

Mango

Mango

Common Names

Mampalang (Sul.), pahutan, paho or pajo, Manggang- kalabau

Description

Mangifera indica, commonly known as mango, is a species of flowering plant in the family Anacardiaceae. It is a large fruit tree, capable of growing to a height of 30 meters (https://www.google.com/)search?q=mango+-description&oq=mango+description. Retrieved May 26, 2023).

Anthelmintic benefit

The concentrations of 30%, 40%, 50% and 60% of the hydro-alcoholic extract of mango seed kernels were used in vitro against adult *Trichoschongylus* spp. The mango seed kernel extract with the concentrations 30%, 40% and 50% killed all the adult *Trichoschongylus* spp. within 15-18 hours of exposure while the 60% concentration killed all the adult parasites within 12-15 hours of exposure (Bernabe, 2009).

Mango seed extract administered to pigs naturally infected with gastrointestinal nematodes once orally at a dose of 800 mg of mango seed extract /kg body weight had reduced the fecal egg counts to 88.57% at day 28 after treatment (Reyno, 2021).

MAKABUHAY

MAKABUHAY

MAKABUHAY

Common Names

Makabuhay; Panyawan

Description

The plant is generally found in most islands of the Philippines. It is a climbing vine that grows in the wild and can be propagated through stem cutting. It can grow to a height of 4 to 10 meters. The leaves are thin-sheathed, heart-shaped, smooth and shining, 6 to 12 cm in length and 7 to 10 cm in width. It bears flowers that are pale green and short-pedicelled, and fruits that measure 7 to 8 mm long (Dweck, 2006).

Anthelmintic benefit

1. An ethanolic extract (200 mg/kg) of the stem administered to goats naturally infected with common gastro-intestinal nematodes had caused a reduction in the fecal egg counts after treatment with the highest efficacy of 83.81% on the 5th day post-treatment (Cagungao, 2017).

2. Capsulated extract administered to goats infected with *Hemonchus contortus* at a dose of 30 mg/kg body weight had resulted in 97.5% fecal egg count reduction (Dondonayos, 1998).

3. A powdered preparation of stem extract had been found to have similar efficacy to albendazole (commercial drug) when administered to buffaloes infected with liver fluke, *Fasciola gigantica* (Presto, 2007).

Tubli
Tubli
Tubli

Common Names
Derris; Tubli; Tuba

Description
Derris elliptica (Roxb) (Benth) is a leguminous plant. It is a vine with brown hairs covering its stems. The leaves are pinnate and grow up to 30-50 cm long and the oblong leaflets are 9 to 13 cm long. It bears pods which are 5 to 8 cm long and contain 1 to 3 seeds (wikipedia.org/wiki/Derris_elliptica). Retrieved August 7, 2023.

Anthelmintic benefit
Root powder (at 30%) incorporated into molasses-mineral-salt block and used as lick of goats naturally infected with common gastro-intestinal nematodes. The fecal egg counts of the nematodes in goats had decreased up to 88.27% on the 4th week, and 97.21% on the 6th week (Anunciado, 2021).

Carabao Grass

Carabao Grass

Carabao Grass

Common Names

yard-grass, goose grass, wiregrass, or crowfoot

Description

Goose Grass is a summer annual about ½–2′ tall that is tufted at the base, sending up multiple ascending culms with alternate leaves. Most of the leaves are located toward the base of the culms. The culms are green, glabrous, and somewhat flattened; they are mostly hidden by the sheaths. The leaf blades are up to 10" long and 8 mm.(https://www.google.com). Retrieved May 26, 2023.

Anthelmintic benefit

In-vivo administration of 2,000 mg goose grass leaf extract /5 kg BW of goats had reduced the fecal egg counts of trichostrongylid nematodes in goats by 100% on Day 14 after a single treatment (Eway, 2021).

Banana

Banana

Banana

Common Names

Banana, Cavendish banana , Saging

Description

A banana is a curved, yellow fruit with a thick skin and soft sweet flesh. A banana is a tropical fruit that is quite popular all over the world. It grows in bunches on a banana tree (http://www.google.com/searchq=banana+description). Retrieved May 26, 2023.

Anthelmintic benefit

A concentration of 9 ml/kg BW banana peel crude extract once a day on the 1st, 8th, and 15th day of the experiment had reduced the fecal egg counts to as much as 68.82% in backyard native chickens naturally infected with gastrointestinal nematodes (Maquerme, 2022).

BETEL NUT

BETEL NUT
BETEL NUT

Common Names

Becc. Bunga de Jolo , Actinorhytis calapparia
Vidal. Bungang tsina

Description

Bunga is an erect, solitary tree growing to 25 meters high, and marked with annular scars. Leaves about 3 to 4 meters long with numerous leaflets, 60 to 90 centimeters long, the upper ones confluent (http://www.stuartxchange.com/Bunga.html).

Anthelmintic benefit

1. Betel nut extract (750 mg/kg) administered to goats naturally infected with common nematodes showed an efficacy of 71.78% on Day 7 and 75.41% on Day 14 after a single dose of treatment (Viado, 2013).

MAKABUHAY

MAKABUHAY

MAKABUHAY

Common Names

Panyawan

Description

Makabuhay can be found in wild forests and can be identified by its heart shaped leaves. Makabuhay is a shrub whose aerial roots climb other trees usually neem or mango trees (https://www.google.com/search?q=makabuhay+plant+description). Retrieved May 26 ,2023.

Anthelmintic benefit

1. Mixed makabuhay (250 mg/kg bw) and bunga (1500 mg/kg bw) extract administered to goats naturally infected with fasciolosis once orally had reduced the egg gram count of fasciola up to 90-100% at 21st day of treatment (Jaro, 2016).

MARIGOLD
MARIGOLD
MARIGOLD

Common Names

Tagetes, marigolds

Description

Members of the genus Tagetes have attractive yellow, orange, or red composite flowers that are solitary on the stems or clustered. The leaves are arranged opposite each other on the stem and are usually finely cut (https://www.britannica.com/plant/marigold) https://www.britannica.com/plant/marigold). Retrieved May 22, 2023.

Anthelmintic benefit

In vivo, 100 mg/kg bw of marigold flower extract given once had significantly reduced the fecal egg counts of goats naturally infected with trichostrongylid nematodes on Days 1 to 21 post treatment. This was comparable to the positive control levamisole (Bernal, 2013).

Azadirachta indica

Azadirachta indica

Azadirachta indica

Common Names

margosa, neem, nimtree or Indian lilac

Description

The neem tree (Azadirachta Indica) is one of nature's most versatile plants, and is best known for its highly effective insecticidal oil. However, as every part of the tree is used in different ways, there's a lot to discover about this fascinating species (https://medium.com/@FastTreeRemovalServices Atlanta/neem-tree-3information-uses). Retrieved June 5, 2023.

Anthelmintic benefit

Neem leaf powder (at 30%) incorporated into molasses-mineral-salt block as licks in goats naturally infected with common gastro-intestinal nematodes. Fecal egg count reduction of up to 76.19% on the 6th week of ad-libitum access to the blocks (Bragado, 2021).

Damong Maria
mugwort, wormwood, and sagebrush.

Marigold
pot marigold, marygold, poet's marigold, Scotch marigold, Scottish marigold

Saluyot
Saluyot, jute

COMBINED CAPSULATED EXTRACTS OF SALUYOT, DAMONG MARIA AND MARIGOLD

Description

Damong Maria- an erect perennial herb, hairy, aromatic, rank smelling, often half-woody, growing to a height of 1 meter or less.

Marigold- members of the genus Tagetes have attractive yellow, orange, or red composite flowers that are solitary on the stems or clustered.

Saluyot – is famous for its sturdy, natural fiber but there are cultivars that are grown as a leafy vegetable. The young leaves are used fresh or dried.

Anthelmintic benefit

Combined capsulated extracts of saluyot, damong Maria and marigold (100% saluyot, 40% damong maria and 80% marigold) administered to infected goats with common nematodes once at a dose of 100mg/ kg body weight had resulted in 89.95% fecal egg count reduction at Day 7 after treatment (Halili , 2012).

Agave sisalina

Agave sisalina

Agave sisalina

Common Names

Sisal; Sisal hemp; Agave; Century plant; Sisal agave;

Description

Sisal is a monocotyledonous plant. It is a woody herb with a rosette of thick fleshy spiny leaves that are sword-shaped. The leaves measure up to 2 meters long, with spiny edges, and sharp, dark brown tip (The Environmental Weeds of Australia, Sheldon Navie & Steve Adkins, May 26, 2023).

Anthelmintic benefit

The efficacies of ethanolic extract of sisal leaves (at 200 mg/kg body weight; 400 mg/kg body weight; 600 mg/kg body weight) administered as a single dose to goats naturally infected with common gastro-intestinal nematodes were as follows (Navos, 2021):

200 mg/kg bw: 71.08% (1st week); 81.89% (2nd week); 80.14% (3rd week);
400 mg/kg bw: 70.36% (1st week); 81.78% (2nd week); 76.24% (3rd week); and
600 mg/kg bw: 81.61% (1st week); 92.70% (2nd week); 86.92% (3rd week).

The efficacies were significantly similar with that of levamisole (a commercial drug).

MAKABUHAY

MAKABUHAY

MAKABUHAY

Common Names

Tinospora, Makabuhay, Boraphet

Description

Makabuhay is a climbing, dioeciously vine reaching a height of 4 to 10 meters. Stems are up to 1 centimeter thick and somewhat fleshy, with scattered protuberances. Leaves are thin, ovate, 6 to 12 centimeters long, and 7 to 12 centimeters wide, with pointed and truncate or somewhat heart-shaped based, smooth and shining (https://www.google.com/search?)q=description+of+makabuhay). Retrieved (May 7, 2023).

Anthelmintic benefit

The concentrations of 600 mg/kg BW and 300 mg/kg BW of the stem extract of makabuhay had reduced the fecal oocyst counts to as much as 87.54% and 75.74%, respectively in goats naturally infected with coccidia on Day 28 after a single treatment (Saladino, 2021).

Moringa oleifera

Moringa oleifera

Moringa oleifera

Common Names

Malunggay; Marungay; Calamungay; Horseradish tree, Drumstick tree; Ben oil tree

Description

Moringa oleifera is an angiosperm plant that is native of the Indian subcontinent. It is a small deciduous tree with a sparse foliage.The tree can grow to a height of 10-12 m. It has a spreading open crown, typically umbrella-shaped. Leaves are alternate; 7-60 cm long, tripinnately compound with each pinnate bearing 4-6 pairs of leaflets that are dark-green, elliptical to obovate, and 1-2 cm in length. It fruit is typically 3-valved capsule, 10 to 60 cm in length. When young, the fruit is green and when it matures it turns brown (FAO, 2014).

Anthelmintic benefit

In vitro killing of adult *Trichostrongylus* spp. by 40%, 50%, 60% and 70% concentrations of a methanolic from *J. curcas* leaves. The 40% concentration had killed adult worms after 12 hours of incubation; the 50% and 60% on the 9th hour; and the 70% on the 12th hour (Fugata, 2009).

In vitro effect of 40, 50, 60 and 70 percent leaf extract was demonstrated on eggs of *Trichostrongylus* spp. through inhibition of the hatching of eggs of the worms after 48 hours of incubation (Fugata, 2009).

Gliricidia sepium

Gliricidia sepium

Gliricidia sepium

Common Names

Madre-de-Cacao; Kakawate

Description

Madre-de-Cacao is a medium-sized legume which belongs to the family Fabaceae. It reaches a height of 2-15 m and occasionally 20 m. It has a smooth grey-brown or pale whitish grey bark on young branches. The leaves are 15-35 cm long and arranged alternately or sometimes sub-opposite; they are pinnate with an odd terminal leaflet, and 6-24 opposite leaflets per leaf. The leaflets are narrowly elliptic to elliptic with pointed tips, and range in size from 44 to 83 mm long, 17-48 mm wide (Rojas-Sandoval, 2017).

Anthelmintic benefit

1. Leaf powder of madre-de-cacao was incorporated in molasses-mineral salt block at 50% and 60% concentrations. The blocks were used as licks for goats naturally infected with common gastro-intestinal nematodes. On the sixth week, a reduction in fecal egg counts of up to 72% (at 50%) and up to 85.38% (at 60%) was observed. These efficacies were significantly similar with that of the positive control which was ivermectin (a commercial drug) (Enriquez, 2021).

2. A combination of leaf powder of madre-de-cacao (30%) and leaf powder of moringa (30% malunggay) incorporated in molasses-mineral-salt block. The blocks were used as licks for goats naturally infected with common gastro-intestinal nematodes. An efficacy of 74.79% on the 6th week was observed, which was comparable with the efficacy of Ivermectin (Paule, 2021).

Bitter Gourd

Bitter Gourd

Bitter Gourd

Common Names

bitter melon; Goya; bitter apple; bitter gourd; bitter squash; balsam-pear, ampalaya

Description

This herbaceous, tendril-bearing vine grows up to 5 m (16 ft) in length. It bears simple, alternate leaves 4–12 cm (1.6–4.7 inch across, with three to seven deeply separated lobes. Each plant bears separate yellow male and female flowers (https://www.google.com/search?q=bitter+gourd&oq=bitter+gourd. Retrieved June 20, 2023).

Anthelmintic benefit

The efficacy of three concentrations of leaf extract of the plant (300, 600, & 1000 mg leaf extract/kg BW of goats) was evaluated in goats naturally infected with trichostrongylid nematodes. The concentration of 1000 mg/kg BW given once exhibited 89.69% efficacy in reducing the number of eggs of the parasites in the goats' feces. The efficacy was comparable to levamisole (Millondaga, 2022).

Tobacco

Tobacco

Common Names

Tobacco: Ciggies, darts, durries, rollies, smokes, fags, butts, cancer sticks.

Tobacco is the common name of several plants in the genus Nicotiana of the family Solanaceae, and the general term for any product prepared from the cured, aged, and processed in various ways.

Anthelmintic benefit

The efficacies of combined tobacco and nutgrass extract (500mg tobacco and 1250 mg nutgrass/kg BW; 1000mg tobacco and 2500 mg nutgrass/kg BW; 2000 mg tobacco and 5000 mg nut / kg BW; 2500mg tobacco and 6250 mg nutgrass/kg BW) in reducing fecal egg counts in goats naturally infected with trichostrongylid nematodes were as follows (Quinlat, 2022):

500 mg tobacco and 1250 mg nutgrass (93.40%)

1000 mg tobacco and 2500 mg and nutgrass (95.27%)

2000 mg tobacco and 5000 mg nut grass-(97.74%)

2500mg tobaco and 6250 mg nutgrass (98.99%)

Nutgrass

Nutgrass

Common Names

Nutgrass: Coco grass, Ground almond, Java grass, Red nutgrass.

Nutgrass - A very troublesome weed of crops, orchards, vineyards, fallows, lawns, footpaths, gardens, parks, pastures, waste areas and disturbed sites. Nutgrass (brisbane.qld.gov.au) retrieved June 20, 2023.

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