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Assess the performance of herbal extract for managing ectoparasite infestation in goat

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Abstract
In order to control various poultry diseases, ethno-veterinary medicine is widely practiced by poor village farmers. The use of ethno veterinary medicine can be considered sustainable as it is economical, culturally acceptable and ecologically sound. The OFT trial was conducted at Udumalpet, Kudimanagalm and Anthiyur blocks of Tiruppur district of Tamil Nadu on 2021. Ten farmers were selected and implementations of the trails, the selected farmers were trained on Ethno-veterinary practices in livestock disease management and method of preparation & administration procedures. The farmers were provided with quality herbs and spices to manage the ectoparasite infestation in goats. It was found that spraying of herbal extract to infected goats recovered in 8 days with six months average body weight of 15.17 kg, whereas, the chemical treatment given to ectoparasite infected animals recovered in 5 days with six month body weight of 13.64 kg.

Keywords: Goats, Neem leaves and ectoparasites, administration procedures, herbal extract

Introduction
Goat is a multi-functional animal and plays a significant role in the economy and nutrition of landless, small and marginal farmers in the country. Goat rearing is an enterprise which has been practiced by a large section of population in rural areas of Erode district. Goats can efficiently survive on available shrubs and trees in adverse harsh environment in low fertility lands where no other crop can be grown. In goats, Infestation by ectoparasites could lead to economic losses and loss of productivity and severe cases cause mortality. Zoonotic aspects have gained more importance as they transmit several types of pathogens between animals and to humans due to their blood sucking habits. Therefore adoption of EVM package in ectoparasites control will improve the goat productivity and economy of the rural farmers.
Small ruminants are reared by the poor and marginalized farmers and play an important role in the rural economy. Presence of parasites visible all over the body will cause animal emaciated, dull and death in severe cases. The existing farmer's practices on chemical treatment for controlling ectoparasites is expensive and continuous follow of this method, ectoparasites developed resistance to chemicals. Hence, these Ethno veterinary practices to manage this problem in small ruminants.

Materials and Methods
The present study was conducted in the Erode district situated between 10-35' and 11-60' of north latitude and 76.49' and 77.58' of East longitude and 171-91' meters above the mean sea level. The river Cauvery flows on the north and eastern part of the District. Erode town sweats under very hot spells during summer. The trial on was taken up during the year 2021 in 10 farmers field in Sathiyamangalam, TN Palayam and Anthiyur blocks of Erode district. Before implementation of the trails, the selected farmers were trained on Ethno-veterinary practices in livestock disease management and method of preparation& administration procedures.

- **Farmer Practice:** Chemical method-Cypermethrin/Deltamethrin /Flumethrin.
- **Technology Option-1:** Ethno veterinary herbal extract (TANUVAS-VUTRC Tanjore).

The farmers were provided with quality herbs and spices (Garlic-10 bulbs, Neem leaves-01 handful, Neem fruit-01 handful, Acorus rhizome-10g, Turmeric powder-20g, Lantana leaves-01 handful, Thulasi leaves-01 handful)

Table 1: Phytochemical constituents and therapeutic uses of selected herbs and spices

SL. No	Name of the Herb/Spices	Phytochemical Constituents of Garlic	Therapeutic Uses
1.	Garlic	Organosulfur compounds such as allicin, diallyl thiosulfonate (allicin), diallyl sulfide (DAS), diallyl disulfide (DADS), diallyl trisulfide (DATS), E/Z-ajoen, S-allylmercapto, N-acetylcysteine (NAC) and S-allyl-cysteine	Antioxidant activity, anti-inflammatory activity, antibacterial activity antiviral activity, anthelmintic activity
2.	Neem leaves	• **Azadirachtin:** The most abundant active constituent in neem leaves. • **Quercetin and ß-sitosterol:** Polyphenolic flavonoids with antibacterial and antifungal properties. • **Nimbin, nimbolinin, nimbidin, nimbidol, sodium nimbinate, gedunin, salannin**: Other active constituents of neem leaves. • **Ascorbic acid, n-hexacosanol, and amino acid:** Ingredients found in neem leaves. • Glycoproteins, triterpenes, limonoids, flavonoids, phenols, tannins, catechins, and gallic acid.	Antiemetic, antifungal, anticlotting agent, anti-helminthic, anti-tuberculosis, antineoplastic, antiseptic, antiviral, insecticides, nematicides and insect repellent
3.	Neem fruit	• **Isoprenoids**: Diterpenes, triterpenes, limonoids, vilasinins, and c-secomeliacin. • **Nonisoprenoids**: Proteins, polysaccharides, sulfur compounds, dihydrochalcone, tannin, and polyphenols. • **Other metabolites**: Nimbine, nimbolide, azadirachtin, azadirone, azadiradione, and gedunine	Anti-viral, anti-malarial, anti-bacterial, anti-cancer, anti-inflammatory, anti-oxidant, anti-apoptotic, insect-repellent and larvicidal properties. Azadirachtin in Neem oil can disrupt the molting and growth of mosquito larvae.
4.	Acorus rhizome	• **Essential oils:** Contain calamen, clamenol, calameon, and asarone • **Other compounds:** Contain β-asarone, α-asarone, elemicine, cisisoelemicine, cis and trans isoeugenol, camphene, acorone, and acrenone • **Glycosides:** Contain acorine, a bitter glycoside • **Other constituents:** Contain sterols, phenylpropanoids, triterpene glycosides, sesquiterpenoids, triterpenoid saponins, monoterpenes, and alkaloids	The rhizomes of an herb *Acorus calamus* Linn. (Acoraceae) have been widely used as a traditional medicine to cure intestinal-helminthic infections in India and South Africa (Purobi Nath and Arun K Yadav, 2016) [2]
5.	Turmeric powder	• **Curcuminoids:** The most active component of turmeric, curcuminoids are responsible for the spice's golden yellow color and therapeutic effects. The four main curcuminoids are curcumin, desmethoxycurcumin, bis-desmethoxycurcumin, and cyclocurcumin. • **Volatile oils:** These include turmerone, germacrone, atlantone, and zingiberene, which are responsible for turmeric's aroma. • **Other components:** Turmeric also contains sugars, proteins, resins, dietary minerals, and dietary fiber	Antioxidant, hepatoprotective, anti-osteoarthritis, anti-inflammatory, aanticancer, antiarthritic, neuroprotective, antidiabetic, antidiarrheal activity, anti-microbial, anti-atherosclerotic, antidepressant, anti-ageing, wound healing and memory enhancing activities
6.	Lantana leaves	Flavonoids, Alkaloids, Phenols, Glycosides, Tannins, Terpenoids, Steroids, Anthocyanin, Quinones, Cardiac glycosides, Caumarins, Phlobatannins, Anthraquinones, Lantanadenes,	Wound healing, fever treatment, cough treatment, influenza treatment, stomach ache, malaria
7.	Thulasi leaves	• **Eugenol:** A major constituent of Tulsi essential oil, which is made up of 70% eugenol. • Rosmarinic acid, Apigenin, Myretenal, Luteolin, β-sitosterol, Carnosic acid, Oleanolic acid Carvacrol and Linalool	Anti-inflammatory property, antiemetic property, Antidiabetic property, hypotensive properties, Hypolipidemic (lowers cholesterol) property, analgesic property, anti-asthmatic property, hepatoprotective property, anti-stress properties, anti-epileptic property, Anticarcinogenic property, anti-Alzheimer's property.

Method of preparation

Blend all the above ingredients and add one litre of clean water, filter it and finally transfer to a bottle attached to a sprayer.

Method of administration

Spray on the entire body of the animal also sprays on any cracks and crevices in the Goat shed. Repeat once a week till the condition resolves. Do the application only during sunny part of the day.

Results

Table 2: Performance of the technology

Technology Option	No of trials	Days require to recovery after treatment (Days)	Net Returns/animal (In thousands)	B:C ratio
Farmers Practice: Chemical method	10	5.3	1.78	1.76
Technology 1: Ethno veterinary herbal extract (TANUVAS-VUTRC Tanjore)		7.5	2.35	2.06

Technology option	Other parameters	
	Infestation percentage	Body weight at 6th month
Farmers Practice: Chemical method	25.7	13.64kg
Technology 1: Ethno veterinary herbal extract (TANUVAS-VUTRC Tanjore)	26.2	15.17kg

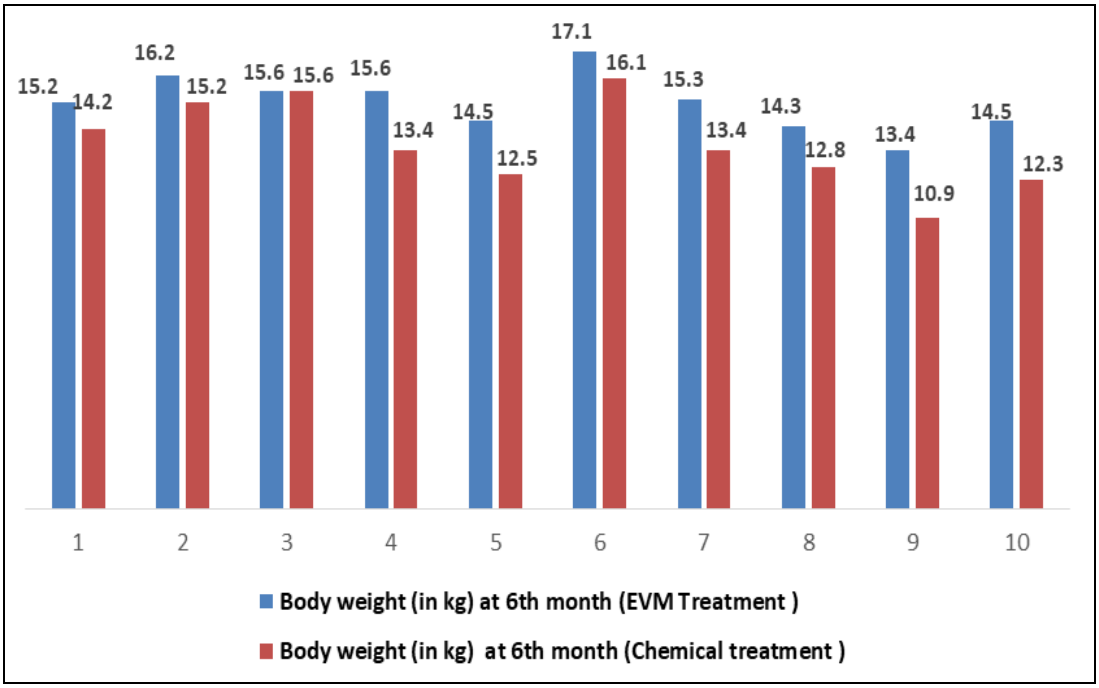

Fig 1: Comparision of body weight @ 6th month age

Results and Discussion

The result reveals that the spraying of herbal extract to infected goats with ectoparasite infestation recovered in 8 days with six months average body weight of 15.17 kg, whereas, the chemical treatment given to ectoparasite infected animals recovered in 5 days with six month body weight of 13.64 kg. However, the chemical treatment has higher reoccurrence of infestation than the herbal treatment**.** Creating fumes by burning of Neem (*Azadirachta indica* A. Juss) leaves near affected animals for tracking the problem of ectoparasites was reported by De HK, 1994 and Pandey, 1996. These traditional methods of treatment besides being cheaper, accessible and prepared from locally available material, are also better adapted to the local conditions. The very fact that traditional methods or knowledge base has its base in the years of experimentations by the local people in their own conditions on sustained basis makes them worth the attention of the research system by means of documenting and validating them. (Aishwarya Dudi, 2015) [4]. *Azadirachta indica*, commonly known as Neem, a major component in siddha medicine and Ayurvedic and Unani medicine and is particularly prescribed for skin diseases.

Feedback of the farmers involved

EVM practices have lower reoccurrence of infestation and low cost method when compare to chemical treatment and it can be done with locally available herbs and spices.

Feed back to the scientist who developed the technology

The EVM method was released by TANUVAS-VUTRC, Tanjore had performed better and proves alternative therapy for chemical method. The farmers in Erode district in the recent past, adopting the EVM technology for the livestock disease management.

Conflict of Interest: Not available

Financial Support: Not available

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