NATURALISTA CAMPANO
ISSN: 1827-7160
Volume 28 Issue 1, 2024

Anthelmentic Activity of Syzygium Aromatica Compare with Marketed Formulation of Albendazole Suspension

Kiran C. Mahajan[1*], Aditya R. Suryawanshi[2], Santosh B. Kallur[3], Urmila V. Anande[4], Shubhangi T. Chakave[5], Mamata G. Vishe[6], Yogesh V. Marewad[7], Maya K. Pokharkar[8]

[1*] Professor, Department of Pharmaceutics, SGMSPM's Sharadchandra Pawar College of Pharmacy, Dumbarwadi (Otur), Tal- Junnar, Dist.- Pune, Maharashtra, India.
[2, 3, 4, 5, 6, 7, 8] Department of Pharmaceutics, SGMSPM's Sharadchandra Pawar College of Pharmacy, Dumbarwadi (Otur), Tal- Junnar, Dist.- Pune, Maharashtra, India.

Corresponding Email: [1*]kirancmahajan@gmail.com

Abstract: The anthelmintic drugs show their effects on the human body and their regular activities by causing helminthiasis which is a very severe parasitic disease. The paralysis and death time of earthworms after administering doses were determined. The result of anthelmintic activity of earthworms showed that the earthworms had taken less time for paralysis and less time for death. It can be concluded that earthworms can be used successfully for the anthelmintic activity study as it is easy, prominent, an adaptable to laboratory conditions. Evaluation of anthelmintic activity of any drug when carried out in laboratory conditions by using the isolated worms from nature cannot be adaptable with artificial laboratory conditions. The present anthelmintic activity study reveals a new methodology with earth worms cultured in laboratory conditions. We studied the anthelmintic activities of an*Syzygiumaromaticum*compare with marketed formulation of *albendazole*suspension. The result showed that the earthworms had taken less time for paralysis and death when used*Syzygiumaromaticum*bud powder extract. This novel dosage form might be a promising dosage form in the prevention of worm infections for pediatric patients.

Keywords: Anthelmentic, Syzygiumaromaticum, Albendazole Suspension, Earthworms, Paralysis.

1. Introduction

One of the most prevalent types of parasitic diseases in humans, helminth infections impact a significant section of the global populace, particularly children. They are a significant public health danger in underdeveloped nations, where they also increase the incidence of pneumonia, eosinophilia, anemia, and malnutrition. According to estimates from the World Health Organization, helminthiasis affects approximately two billion people.By 2025, it is projected that 57% of people living in emerging nations will be prone. It is now recognized that helminth infections are the cause of numerous acute and chronic health conditions in both humans and cattle. The majority of cattle have worm diseases, and over half of the world's population is infected in one way or another. Because helminth infections predispose people to other diseases including bacterial and fungal infections, they constitute a major health concern in the majority of developing and underdeveloped nations. [1-2]
Worm infections, also referred to as helminthiasis, are a serious public health concern in both developed and developing nations, especially for young people. Around 2 billion children worldwide suffer from illnesses brought on by intestinal parasitic worms in humans. According to estimates from the World Health Organization (WHO), parasitic helminth infections would affect almost 57% of people living in developing nations by 2025. Although intestinal worm infections are not thought to be the main parasites that affect children, their extremely harmful prevalence in pediatric cases worldwide calls for extra care. At the moment, mebendazole, albendazole, pyrantelpamoate, and levamisole are the primary anthelminthic medications that have been approved by the WHO to combat intestinal worms.
These current treatment plans, however, are limited in that they rarely affect mature worms, which typically remain in their host for a number of years. Furthermore, earlier studies shown that anthelminthic drugs may have adverse effects that include headaches, nausea, vomiting, diarrhea, and stomach pain. Furthermore, even though mebendazole and albendazole are thought to be the most effective medications for treating pinworm infection, reports of side effects have mostly involved stomach issues. Furthermore, helminths have evolved to

become resistant to anthelmintic medications. Alternative methods of combating intestinal parasitic worms are desperately needed because of the growing resistance to anthelmintic medications, their negative side effects, and their inefficiency.[3]
The native Indonesian plant known as clove (Syzygiumaromaticum) is utilized in the culinary, beverage, medicine, and kretek cigarette sectors. In the modern day, Tanzania, Madagascar, India, the South of China, and other nations all farm it. Dried clove shoots and essential oil produced from shoots, leaves, or stems are the two major goods that are typically sold with cloves. Clove buds are used to treat diarrhea, dyspepsia, and gastritis; clove oil has been utilized as a carminative, antispasmodic, antimicrobial, and anthelmintic in traditional Chinese medicine. Eugenol is the primary active ingredient in clove essential oil. [4]

2. Methodology

Drugs / Material

The *Syzygiumaromaticum* bud were purchased from shreedhanvanatari herbals (Pune), The marketed preparation of Albendazole oral suspension IP purchased from Mankind pharmaPvt. Ltd.

Preparation of Extraction

The crude clove (*Syzygium aromatic*) bud purchased from local market in shreedhanvantari herbals (Pune). The clove bud material is sun dry under observation for 2 days and then milled into coarse powder by using clean mortar and pestle. The powdered material (200g) was percolated with 95% ethanol (2500ml) for two weeks. The extract was filtered and collected.

Collection of Earthworms

Earthworms were spotted in a marshy region near Otur, Pune, India. Earthworms size ranged between 8 to 12 cm. These earthworms are washed in saline solution. Due to its anatomical and physiological resemblance to intestinal round worms and parasites of human beings were used in *in-vitro* to evaluate anthelmintic activity.

3. Evaluation of Anthelmintic Activity by Using Earthworms

In ethanolic extract of Syzygiumaromaticum bud powder.

In a petriplate with 10 ml of ethaonolic extract of Syzygiumaromaticum. These earthworms are dipped in ethanolicexract. These earthworms noted the paralysing started time and fully paralysing time of earthworms.

In marketed suspension of albendazole

In a petriplate with 10 ml of albendazole suspension. These earthworms are dipped in albendazole suspension. These earthworms noted the paralysing started time and fully paralysing time of earthworms.

4. Result And Discussion

Six earthworms were collected and transferred immediately to an ethanloic extract of Syzygiumaromaticum bud powder containing petri plate in fig 1. The average time taken for paralysis were 22 ± 24 seconds and the earthworms died in 46 ± 48 seconds. The against anthelmintic activity of marketed preparation of albendazole suspension containing petriplate dipped the earthworms the average time taken for paralysis were 88 ± 90 seconds and the earthworms died in 228 ± 230 seconds. The ethanolic extract of Syzygiumaromaticum bud powder is more potent than marketed formulation. The Syzygiumaromaticum (clove) bud powder ethanolic extract is herbal preparation it has no side effects.
The Figure 1 shows the Earthworms in ethanolic extract Syzygiumaromaticum bud powder and the Figure 2 shows the Earthworms in Albendazole suspension.

FIGURE 1: Earthworms in ethanolic extract Syzygiumaromaticum bud powder

FIGURE 2: Earthworms in Albendazole suspension

TABLE 1: The comparison between Herbal suspension with Marketed suspension

Time (Sec) / Drugs	Started point (Dipped point)	Paralysing started	Fully paralyzed (Died)
Ethanolic extract of Syzygiumaromaticum bud powder	0 sec	22 ± 24 sec	46 ± 48 sec
Albendazole suspension	0 sec	88 ± 90 sec	228 ± 230 sec

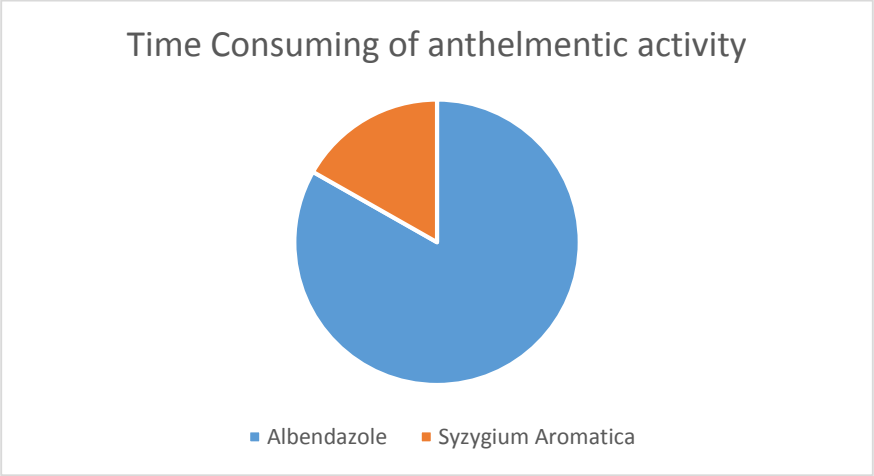

FIGURE 3: Time consuming of anthelmintic activity

The Figure 3 shows the time consuming of anthelmintic activity

5. Conclusion

The clove (*Syzygium aromatic*) bud powder ethanolic extract contains active compounds that can cause death and paralysis to earthworms. Earthworms less time required for paralysing started in ethanolic extract of clove bud powder 22 ± 24 seconds and died in 46 ± 48 seconds than marketed formulation of *albendazole* suspension require more time for paralysis 88 ± 90 seconds and died in 228 ± 230 seconds (table 1). Therefore for anthelmintic action on earthworms was significant in the ethanolic extract of *syzygium aromatic* bud powder as compare to marketed formulation of *albendazole* suspension.

6. References

1. Tripathi K.D. Essentials of Medical Pharmacology, Jaypee Brother Medical Publisher Pvt. Ltd. 7th edition, 2013:854-55.
2. Ghausia Islam , NasreenJahan; Anthelmintic activity of MajoonSarakhs on Earthworm, Bangladesh Journal of Medical Science Vol. 19 No. 04 October'20
3. HemagirriManisekaran , Muhammad LuqmanSelahuddeen, Zaidah Rahmat1, Faizuan Abdullah and Abdul Fatah A. Samad; Evaluation of The In-Vitro Anthelmintic Activity of Leucaszeylanica Extracts on Earthworms, Malaysian Applied Biology (2023) 52(4): 57-64 https://doi.org/10.55230/mabjournal. v52i4.d119
4. SantikaAnggrahini, IrkhamWidiyono , SoedarmantoIndarjulianto and JokoPrastowo; In vitro anthelmintic activity of clove-leaf extract (Syzygiumaromaticum) against Ascaridiagalli, Livestock Research for Rural Development 33 (7) 2021
5. Mubarokah W W, W Nurcahyo, J Prastowo and K Kurniasih 2019 In vitro and in vivo Areca catechu crude aqueous extract as an anthelmintic against Ascaridiagalli infection in chickens. Veterinary World, 12, 877-882. http://doi.org/10.14202/vetworld.2019.877-882
6. Vo N N Q, E O Fukushima and T Muranaka 2017 Structure and hemolytic activity relationships of triterpenoidsaponins and sapogenins. Journal of Natural Medicine, 71, 50-58. https://doi.org/10.1007/ s11418-016-1026-9
7. Sherwani SK, Khan MM, Munir S, Shah MA, Kazmi S.U. Anthelminthic potential of crude extract of Camellia sinensis(Green tea). International Research Journal of Pharmacy.2013;4(3): 94-96.
8. Nakuleshwar D J, Choudhary J, Sharma P, Sharma N, Joshi SC. A review on bioactive compounds and medical uses of Commiphoramukul. J.Plant Sci. 2012; 7 (4): 113-137.
9. Gupta, D.K., Agrawal, K.K., Anju, V. &Kishan, S. 2012. Investigation of in-vitro anthelmintic activity of L. lavandulifolia, L. cephalotes and L. aspera. Journal of Pharmacy Research, 5(1): 212– 213.
10. Radha, P., NurHafizah, R., Nagavalli, D., Pruthvi, N., Prabhu, M. &Joysa Ruby, J. 2018. In vitro anthelmintic study of Bauhinia acuminata Linn. leaf extracts against the housefly worms, Indo American Journal of Pharmaceutical Sciences, 5(6): 5082–5089. https://doi.org/10.5281/ zenodo.1287887
11. Dr.Kiran Mahajan; Anthelmintic Activity of Liquid Self Emulsifying Drug Delivery System (SEDDS) of Praziquntel, International Journal of Advanced Research in Science, Communication and Technology (IJARSCT) Volume 2, Issue 1, May 2022
12. F. Khan et al., Systematic Development of Self-Emulsifying Drug Delivery Systems of Atorvastatin with Improved Bioavailability Potential. Sci Pharm. 2012; 80: 1027–1043.
13. Abdullahi Mann; Phytochemical Constituents and Antimicrobial and Grain Protectant Activities of Clove Basil (Ocimumgratissimum L.) Grown in Nigeria, International Journal of Plant Research 2012, 2(1): 51-58 DOI: 10.5923/j.plant.20120201.08