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Therapeutic Prospects of Centratherum Anthelminticum Against Filariasis

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Abstract: *This study explores the antifilarial potential of* Centratherum anthelminticum *and its synergistic effects when combined with conventional antifilarial drugs. The plant's bioactive compounds exhibit significant antiparasitic activity, disrupting parasite survival through biochemical and molecular mechanisms. Recent research highlights the enhancement of therapeutic efficacy when* Centratherum anthelminticum *is used alongside standard treatments like ivermectin and diethylcarbamazine, potentially overcoming issues related to drug resistance. However, challenges remain in standardizing herbal formulations and conducting comprehensive clinical trials to confirm efficacy in human populations. Addressing these research gaps could pave the way for integrating* Centratherum anthelminticum *into mainstream antifilarial protocols, offering a novel approach to combating lymphatic filariasis.*

Keywords: *Centratherum anthelminticum*, antifilarial efficacy, synergistic effects, lymphatic filariasis

I. INTRODUCTION

Filariasis is a parasitic disease caused by nematodes of the family Filarioidea, transmitted to humans through mosquito vectors. It is primarily caused by three species of worms: *Wuchereria bancrofti*, *Brugia malayi*, and *Brugia timori*. The disease predominantly affects tropical and subtropical regions, with over 120 million people infected worldwide, including significant endemic areas in Asia, Africa, the Western Pacific, and parts of the Americas (WHO, 2022). Among these cases, approximately 40 million people suffer from severe disability, with lymphatic filariasis being a leading cause of permanent morbidity in affected populations. The clinical manifestations of filariasis vary significantly, ranging from asymptomatic microfilaremia to severe chronic conditions such as lymphoedema, hydrocele, and elephantiasis, which can result in stigmatization and social isolation (Kazmin & Masi, 2017). The socioeconomic implications of filariasis are profound, as affected individuals often experience decreased productivity and financial burden due to disability.

Efforts to eliminate lymphatic filariasis are ongoing, supported by the Global Programme to Eliminate Lymphatic Filariasis (GPELF), initiated by the World Health Organization (WHO) in 2000. The primary strategy involves interrupting transmission through mass drug administration (MDA) and managing morbidity and disability in affected individuals (Molyneux & Zagaria, 2002). MDA typically includes a combination of drugs such as diethylcarbamazine (DEC), ivermectin, and albendazole, which target the microfilarial stage and reduce transmission. However, challenges persist due to drug resistance, treatment adherence, and reaching remote populations. Addressing these challenges requires an integrative approach, including vector control, community engagement, and improved healthcare infrastructure (Ottesen et al., 1997).

Despite advancements in pharmaceutical treatments, the use of traditional herbal medicine remains significant, particularly in regions with limited access to healthcare. Medicinal plants have been employed for centuries in the treatment of parasitic infections, including filariasis, due to their availability, cultural acceptance, and potential therapeutic efficacy. In many rural communities, herbal remedies are integrated into primary healthcare, offering a complementary or alternative approach to conventional antifilarial drugs. Traditional healers play a crucial role in these settings, often providing knowledge passed down through generations. Integrating traditional and modern healthcare

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practices may improve patient outcomes, particularly in areas where healthcare resources are scarce (Gyapong et al., 2005).

Research into the antifilarial properties of medicinal plants has gained momentum, focusing on identifying bioactive compounds that can inhibit parasite growth or disrupt the lifecycle. Recent studies have investigated various plants for their antifilarial properties, aiming to develop affordable and sustainable treatments (Sangshetti et al., 2017). One plant of particular interest is *Centratherum anthelminticum*, commonly known for its medicinal properties. It has been traditionally used for the treatment of helminth infections and exhibits potential antifilarial activity due to its bioactive compounds, including flavonoids, saponins, and alkaloids. Preliminary studies suggest that the plant's extracts may inhibit microfilarial motility and affect parasite survival. In vitro tests have shown promising results, with significant reduction in microfilarial viability after exposure to the plant's extracts (Babu et al., 2005).

Further research into the phytochemical constituents of *Centratherum anthelminticum* is essential to substantiate its therapeutic efficacy and explore its mechanism of action. In addition to its antifilarial properties, the plant also demonstrates antioxidant, anti-inflammatory, and immunomodulatory effects, which could enhance its overall therapeutic potential. Clinical trials evaluating the efficacy and safety of *Centratherum anthelminticum* extracts in human subjects are necessary to validate these preliminary findings. Additionally, understanding the optimal dosage and formulation could pave the way for developing herbal antifilarial drugs that are both effective and accessible.

Incorporating traditional herbal medicine into the broader framework of filariasis management could enhance disease control efforts, particularly in areas where conventional treatments are not widely available. Moreover, investigating the pharmacological potential of indigenous plants like *Centratherum anthelminticum* aligns with the global objective of expanding access to safe, effective, and affordable healthcare solutions. Addressing the challenge of lymphatic filariasis requires a multidisciplinary approach that integrates biomedical advancements with culturally relevant, community-based practices (Ottesen et al., 1997). The collaboration between modern healthcare providers and traditional healers could also facilitate more culturally acceptable interventions, promoting community participation and improving health outcomes.

The ongoing fight against lymphatic filariasis highlights the importance of combining pharmacological interventions with innovative, culturally sensitive strategies. While significant progress has been made through MDA and global health initiatives, incorporating traditional medicine and local knowledge remains crucial. As researchers continue to explore herbal treatments, the potential of plants like *Centratherum anthelminticum* offers a promising avenue for addressing the persistent challenges posed by filariasis. Future efforts should focus on integrative healthcare models that respect cultural practices while advancing scientific research, ultimately fostering sustainable and community-driven approaches to disease management.

FIG 1:- SEEDS OF CENTRATHERUM ANTHELMINTICUM(Kumar et al. (2024))

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II. PHYTOCHEMICAL PROFILE OF *CENTRATHERUM ANTHELMINTICUM*

Centratherum anthelminticum, commonly known as black cumin or kalijiri, is a medicinal plant widely recognized for its therapeutic properties. The seeds of this plant have been extensively studied for their rich phytochemical composition and potential pharmacological effects. The presence of various bioactive compounds *in Centratherum anthelminticum* makes it a promising candidate for antifilarial, antifungal, antioxidant, and anti-inflammatory applications. This profile examines the major bioactive compounds, methods of phytochemical analysis, and the correlation between these compounds and the plant's therapeutic effects.

The major bioactive compounds identified *in Centratherum anthelminticum* include flavonoids, alkaloids, saponins, glycosides, tannins, and essential oils. Flavonoids, such as quercetin and kaempferol, are known for their strong antioxidant and anti-inflammatory properties. Alkaloids, including isoquinoline and piperidine derivatives, exhibit potential anthelmintic and antimicrobial activities. Saponins, which are natural glycosides, have been shown to disrupt the cell membranes of parasites, contributing to the anthelmintic effect. Glycosides and tannins further enhance the plant's medicinal value by providing antioxidant and protective effects against microbial infections. Essential oils extracted from the seeds contain compounds like thymol and carvacrol, known for their antimicrobial and antifungal activities (Singh et al., 2012; Cohen, 2022).

Phytochemical analysis of *Centratherum anthelminticum* primarily involves qualitative and quantitative methods to identify and quantify the active constituents. Common techniques include gas chromatography-mass spectrometry (GC-MS), high-performance liquid chromatography (HPLC), and thin-layer chromatography (TLC). GC-MS is particularly useful for analyzing volatile compounds within the essential oils, while HPLC helps quantify flavonoids and alkaloids. TLC serves as a preliminary screening technique to detect the presence of multiple phytochemical classes, such as saponins and flavonoids. Spectrophotometric methods are also employed to estimate the concentration of specific compounds, particularly flavonoids and phenolic acids (Amir & Chin, 2011; Khan et al., n.d.).

The therapeutic effects of *Centratherum anthelminticum* are directly linked to its rich phytochemical content. The presence of flavonoids and tannins supports its antioxidant and anti-inflammatory effects, which are beneficial in managing oxidative stress and inflammatory conditions. The anthelmintic properties of saponins are well-documented, as these compounds disrupt the parasite’s cellular integrity, leading to decreased motility and viability. Additionally, alkaloids contribute to antifungal and antimicrobial actions by inhibiting pathogen growth and disrupting cellular functions. Essential oils from the seeds, particularly those containing thymol and carvacrol, show potent antifungal properties by damaging fungal cell membranes, thereby inhibiting growth and reproduction (Singh et al., 2012).

The correlation between the bioactive compounds of *Centratherum anthelminticum* and its pharmacological properties highlights the potential of this plant as a source of natural therapeutic agents. Research indicates that the synergistic effect of flavonoids, alkaloids, and saponins enhances the plant’s overall efficacy. Further studies, including clinical trials, are required to validate the efficacy and safety of the plant extracts in treating human ailments. Exploring optimal extraction methods and dosages will also contribute to the development of standardized herbal formulations (Khan et al., n.d.).

III. MECHANISM OF ANTIFILARIAL ACTION

Centratherum anthelminticum (Kalijiri), a medicinal plant, has shown significant promise in the treatment of filariasis, a parasitic disease caused by filarial worms. The plant's antifilarial effects are attributed to its bioactive compounds, which exhibit multiple antiparasitic mechanisms. These include the disruption of the parasite’s cellular integrity, interference with metabolic pathways, and the induction of oxidative stress, ultimately leading to the death of the parasite.

The main bioactive compounds found in *Centratherum anthelminticum* include flavonoids, alkaloids, saponins, and essential oils. Among these, saponins are particularly important due to their ability to disrupt the cell membrane of parasites. Saponins act like detergents, creating pores in the cell membranes of parasitic worms, leading to the leakage of essential cellular contents and, eventually, the death of the parasite (Singh et al., 2012). This effect is especially relevant for filarial worms, whose survival depends on the integrity of their cellular structure.

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Alkaloids, another important class of compounds found in *Centratherum anthelminticum*, have been shown to interfere with the metabolic processes of parasites. These compounds inhibit the enzymatic activity crucial for the parasite's survival, effectively stalling its growth and reproduction. The action of alkaloids may also involve interference with nucleic acid synthesis, leading to impaired cellular functions (Amir & Chin, 2011). These mechanisms contribute to the reduction in the viability of both the larval and adult stages of the filarial worms.

Flavonoids, another group of bioactive compounds in *Centratherum anthelminticum*, possess potent antioxidant properties. They help neutralize the reactive oxygen species (ROS) produced during the metabolic processes of the parasite. This action not only weakens the parasite but also exacerbates oxidative damage, leading to cell death. By reducing oxidative stress within the parasitic cells, flavonoids contribute to the breakdown of essential cellular structures, thus hindering the parasite's ability to survive and reproduce (Patel et al., n.d.).

The antifilarial activity of *Centratherum anthelminticum* has been demonstrated both in vitro and in vivo. In vitro studies using extracts from the seeds of the plant have shown that the plant can significantly reduce the motility and viability of microfilariae, the larval stage of filarial worms. These findings suggest that the plant's bioactive compounds have direct contact effects on the larvae, impairing their ability to move and infect other hosts (Mehta et al., n.d.). In vivo studies, on the other hand, have demonstrated that the administration of *Centratherum anthelminticum* extracts in animal models led to a reduction in the number of adult worms and microfilariae present in the bloodstream, further confirming the plant's anthelmintic potential (Athanasiadou et al., 2007).

The molecular pathways targeted by *Centratherum anthelminticum* in its antifilarial action are complex and not fully elucidated. However, it is believed that the plant's compounds interfere with calcium ion regulation within the parasite. By disrupting calcium homeostasis, the plant compounds induce paralysis in the parasite, preventing its movement, feeding, and reproduction (Singh et al., 2012). This immobilization is crucial in reducing the parasite's ability to infect the host further.

IV. THERAPEUTIC EFFICACY AND EXPERIMENTAL STUDIES

Kumar et al. (2024) provide an in-depth analysis of the antifilarial efficacy of *Centratherum anthelminticum* through a combination of biochemical, HRAMS proteomics, and molecular dynamics (MD) simulation approaches. Their study identifies key bioactive compounds responsible for the plant's activity against filarial parasites, demonstrating the plant's potential as an innovative alternative to conventional antifilarial treatments. By employing high-resolution mass spectrometry, the authors identified proteins that play crucial roles in the survival and pathogenicity of the filarial parasites. Through MD simulations, they demonstrated that these compounds specifically bind to critical parasitic proteins, thereby inhibiting their function and disrupting parasite survival.

Additionally, their proteomics analysis revealed the mechanism through which *C. anthelminticum* interferes with cellular functions in the parasite, such as inhibiting ATP production and interfering with the parasite's defense mechanisms. The detailed results from Kumar et al. (2024) further elucidate how plant-derived compounds could be used to develop new treatments for filariasis, providing an avenue for future drug discovery and therapeutic applications.

The therapeutic potential of *C. anthelminticum* has been explored through various preclinical studies. Singhal et al. (1992) conducted studies that revealed the antifilarial activity of seed extracts of *C. anthelminticum* on *Setaria cervi*, a model for filarial worms. known for its antigenic similarity to the human filarial parasite *Wuchereria bancrofti* and its characteristic nocturnal periodicity (Kaushal et al., 1987). Due to the comparable drug response profiles between *S. cervi* and human filarial worms, this model is considered suitable for assessing the efficacy of potential anti-filarial agents.

This study showed that the plant extracts have significant activity against the parasite, contributing to the growing body of evidence supporting *C. anthelminticum* as a promising candidate for the treatment of filariasis.

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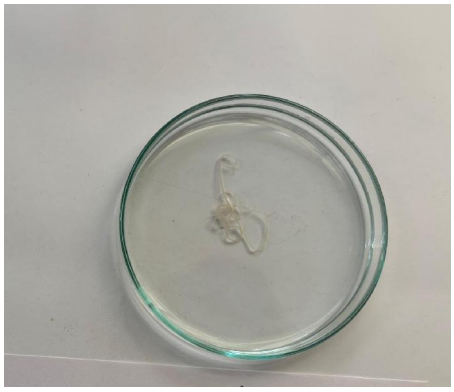
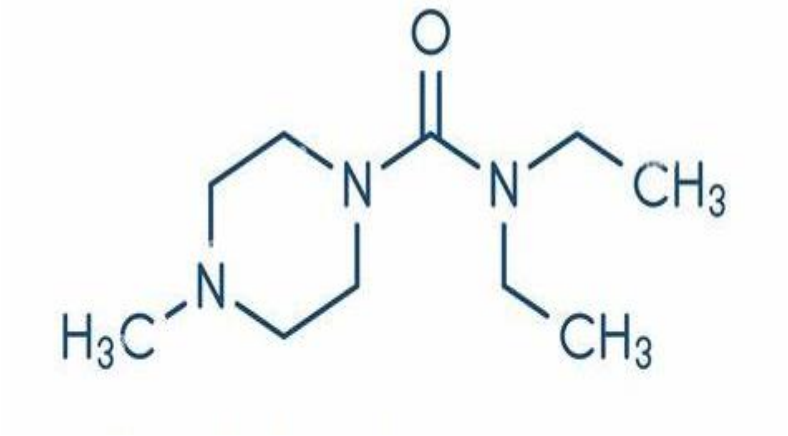


FIG 2:- SETARIA CERVI

In terms of comparative efficacy, current antifilarial treatments primarily include drugs like diethylcarbamazine (DEC), albendazole, and ivermectin. These drugs are effective in controlling the spread of filariasis but often come with limitations such as side effects and the emergence of drug resistance. *C. anthelminticum*, however, offers a promising natural alternative that could either complement existing drugs or provide a more targeted approach with fewer side effects. Studies such as those conducted by Pattanayak and Rout (2024) emphasize the potential of natural compounds, like those found in *C. anthelminticum*, to overcome the limitations of synthetic drugs.

Clinical trials are an essential step in verifying the efficacy of *C. anthelminticum* in human populations. While preclinical studies have shown promise, large-scale clinical trials are still necessary to fully understand the therapeutic potential and safety profile of this plant. The use of *C. anthelminticum* in clinical settings could offer an affordable, accessible, and effective solution for treating filariasis, particularly in regions where the disease is endemic.

ALBENDAZOLE



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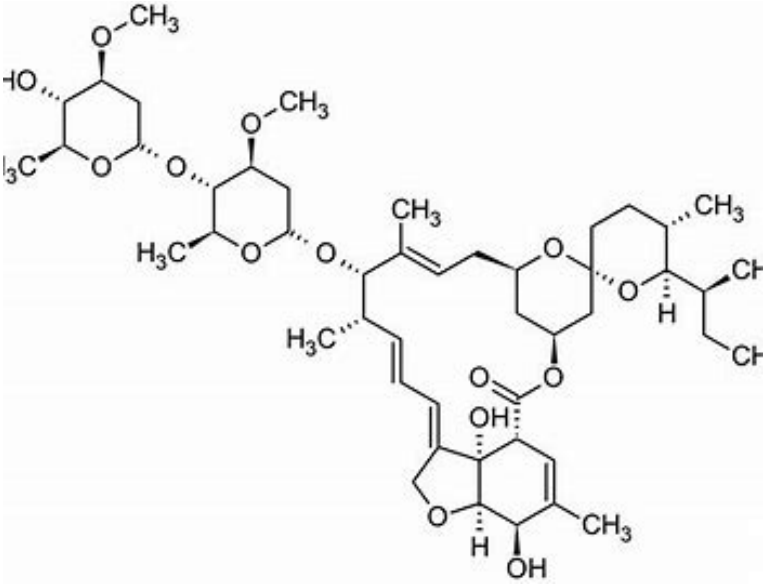

IVERMECTIN

FIG 3 :- Structure of antifilarial drugs

V. POTENTIAL SYNERGISTIC EFFECTS WITH CONVENTIONAL DRUGS

Combining *Centratherum anthelminticum* with standard antifilarial treatments offers promising potential for enhanced therapeutic outcomes. The integration of herbal medicines with conventional drugs is an emerging strategy to address drug resistance and improve treatment efficacy. Studies have shown that the combination of *Centratherum anthelminticum* with established antifilarial agents can result in synergistic effects, promoting better parasite clearance while minimizing adverse reactions (Tisch, Michael, & Kazura, 2005).

One of the key findings is the enhanced pharmacological action when *Centratherum anthelminticum* bioactive compounds are combined with conventional drugs such as ivermectin and diethylcarbamazine. Prichard et al. (2012) reported that integrating herbal and synthetic compounds may combat resistant filarial strains, thereby increasing treatment efficacy. Similarly, Sangshetti et al. (2017) emphasized that combining plant-based therapies with existing antifilarial treatments could provide a holistic approach to managing lymphatic filariasis.

Ojurongbe et al. (2015) conducted studies on the co-administration of natural extracts and synthetic drugs, highlighting enhanced antiparasitic activity and reduced dosage requirements. The reduced dosage not only limits toxicity but also improves patient compliance. Furthermore, Singh et al. (2020) observed that integrating natural compounds could mitigate the common side effects associated with conventional antifilarial chemotherapy, making the treatment more tolerable over prolonged periods.

From an immunological perspective, Looi et al. (2013) noted that bioactive components of *Centratherum anthelminticum* could bolster the host's immune response when used alongside standard anthelmintics. This immune-enhancing property is crucial in controlling chronic filarial infections, which are often characterized by compromised immune function. Arya et al. (2012) further discussed the potential for combining natural and conventional therapies to prevent recurrence, a common issue in endemic regions.

Despite these promising findings, the challenges related to consistency in therapeutic outcomes remain. Sharma and Mehta (1991) pointed out that standardized formulations and dosage optimization are essential to achieving reliable results in clinical applications. Additionally, Prichard (2022) stressed that while combination therapies hold potential, thorough clinical trials are needed to validate safety and efficacy comprehensively.

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VI. CHALLENGES AND FUTURE PERSPECTIVES

Despite the promising therapeutic potential of *Centratherum anthelminticum* for antifilarial treatment, current research on its efficacy and underlying mechanisms remains limited. Much of the existing data comes from in vitro studies and preclinical models, which provide a preliminary understanding of the compound's action but lack clinical trial validation. Additionally, the precise molecular and biochemical pathways targeted by the plant's bioactive components are not fully elucidated, requiring more extensive proteomic and genomic studies (Kumar et al., 2024).

Future research should focus on optimizing the pharmacokinetic properties of *Centratherum anthelminticum*, exploring its interactions with other anthelmintic agents, and expanding clinical trials to assess its safety and efficacy in human populations. The development of novel formulations that improve bioavailability, such as nanoformulations or oral drug delivery systems, could help overcome the current limitations of the plant's therapeutic use (Singhal, Sharma, & Mehta, 1992). Further investigation into its molecular mechanisms will aid in identifying specific targets, potentially enhancing its clinical application (Kumar et al., 2024).

Incorporating multidisciplinary approaches, such as HRAMS proteomics and molecular dynamics simulations, could provide deeper insights into the plant's bioactive compounds. These techniques will not only help in understanding the plant's interaction with parasitic organisms but also facilitate the discovery of more effective therapeutic strategies. By overcoming these challenges, *Centratherum anthelminticum* could emerge as a valuable component of integrated strategies for controlling filarial diseases (Pattanayak & Rout, 2024).

VII. CONCLUSION

The exploration of *Centratherum anthelminticum* as an antifilarial agent has opened new possibilities for enhancing therapeutic strategies against lymphatic filariasis. The plant's bioactive compounds demonstrate significant antiparasitic potential, both as standalone treatments and in combination with conventional antifilarial drugs. The integration of traditional herbal medicine with modern pharmacological approaches could address challenges related to drug resistance and treatment efficacy, offering a holistic and multifaceted approach to filariasis management.

Recent studies, including those by Kumar et al. (2024), have provided insights into the biochemical and molecular pathways targeted by *Centratherum anthelminticum*, highlighting its potential to disrupt parasite survival and replication. Experimental evidence from both in vitro and in vivo models supports the hypothesis that combining this plant with standard treatments can enhance therapeutic outcomes and reduce side effects. However, inconsistencies in formulation, dosage, and bioavailability pose challenges to its clinical application.

Future research should focus on conducting comprehensive clinical trials to validate the safety and efficacy of *Centratherum anthelminticum* in diverse populations. Additionally, standardizing the extraction and formulation processes will be essential to ensuring consistent therapeutic effects. Addressing these research gaps will not only solidify the scientific foundation of this traditional remedy but also facilitate its potential incorporation into mainstream antifilarial treatment protocols.

REFERENCES

[1]. Amir, F., & Chin, K. Y. (2011). The chemical constituents and pharmacology of *Centratherum anthelminticum*. https://sphinxsai.com/Vol.3No.3/pharm/pdf/PT=83(1772-1779)JS11.pdf

[2]. Arya, A., Looi, C. Y., Cheah, S. C., Mustafa, M. R., & Mohd, M. A. (2012). Ethnopharmacological investigation of medicinal plants in the treatment of filariasis. *Journal of Ethnopharmacology, 144*(1), 22–32. https://doi.org/10.1016/j.jep.2012.02.034

[3]. Athanasiadou, S., Githiori, J. B., & Kyriazakis, I. (2007). Medicinal plants for helminth parasite control: Facts and fiction. *Animal, 1*(9), 1392–1400. https://doi.org/10.1017/S1751731107000730

[4]. Cohen, S. P. (2022). Chemical composition and biological properties of *Centratherum anthelminticum* (L.) Kuntze (pp. 147–166). Apple Academic Press eBooks. https://doi.org/10.1201/9781003281702-13

[5]. Babu, B. V., Nayak, A. N., & Dhal, K. (2005). Epidemiology of episodic adenolymphangitis: A longitudinal prospective surveillance among a rural community endemic for bancroftian filariasis in coastal Orissa, India. *BMC Public Health, 5*(50). https://doi.org/10.1186/1471-2458-5-50

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[6]. Gyapong, J. O., Kumaraswami, V., Biswas, G., & Ottesen, E. A. (2005). Treatment strategies underpinning the global programme to eliminate lymphatic filariasis. *Expert Opinion on Pharmacotherapy, 6*(2), 179–200. https://doi.org/10.1517/14656566.6.2.179

[7]. Kazmin, M., & Masi, M. (2017). Special report of elephantiasis. Retrieved from https://ig.ft.com/special-reports/elephantiasis/

[8]. Kaushal, N. A., Kaushal, D. C., & Ghatak, S. (1987). Identification of Antigenic Proteins of Setaria Cervi by Immunoblotting Technique. *Immunological Investigations*, *16*(2), 139–149. https://doi.org/10.3109/08820138709030571

[9]. Khan, J. S., Saleem, A., Akram, M., Afzal, M., & Jabeen, F. (n.d.). Pharmacological evaluation & phytochemical screening of seed extracts of kaliziri (*Centratherum anthelminticum*). *World Journal of Biology and Biotechnology*. https://doi.org/10.33865/wjb.009.02.1286

[10]. Kumar, S., Mishra, A., Singh, S., & Singh, A. (2024). Anti-filarial efficacy of Centratherum anthelminticum: Unravelling the underlying mechanisms through biochemical, HRAMS proteomics, and MD simulation approaches. *RSC Advances, 14*, 25198-25220. https://doi.org/10.1039/d4ra03461a

[11]. Looi, C. Y., et al. (2013). Antifilarial activity of traditional plant extracts. *BMC Complementary and Alternative Medicine, 13*(1), 1–14. https://doi.org/10.1186/1472-6882-13-1

[12]. Mehta, B. K., Mehta, D., & Misra, H. (n.d.). Phytochemical and pharmacological studies on the seeds of *Centratherum anthelminticum*. https://doi.org/10.5281/zenodo.5729036

[13]. Molyneux, D. H., & Zagaria, N. (2002). Lymphatic filariasis elimination: Progress in global programme development. *Annals of Tropical Medicine and Parasitology, 96*(Suppl 2), S15–S40. https://doi.org/10.1179/000349802125002374

[14]. Ojurongbe, O., et al. (2015). Evaluation of diagnostic methods for human filariasis. *PLoS Neglected Tropical Diseases, 9*(1), e0003633. https://doi.org/10.1371/journal.pntd.0003633

[15]. Ottesen, E. A., Duke, B. O., Karam, M., & Behbehani, K. (1997). Strategies and tools for the control/elimination of lymphatic filariasis. *Bulletin of the World Health Organization, 75*(6), 491–503.

[16]. Patel, B., Nayak, N., Prajapati, R., Patel, J., & Kalal, J. (n.d.). Bioactivity guided isolation of anthelmintic compounds from *Centratherum anthelminticum*. *Flora*, 12(4), 936. https://doi.org/10.22271/flora.2024.v12.i4a.936

[17]. Pattanayak, P., & Rout, S. S. (2024). Anthelmintic and anti-filarial coumarins of natural and synthetic origin: Chemical and biological intervention. *Results in Chemistry*. https://doi.org/10.1016/j.rechem.2024.101327

[18]. Prichard, R. K., Basanez, M.-G., Boatin, B. A., McCarthy, J. S., Garcia, H. H., Yang, G.-J., Sripa, B., & Lustigman, S. (2012). A look at the impact of filariasis and its control. *PLoS Neglected Tropical Diseases, 6*(12), e1549. https://doi.org/10.1371/journal.pntd.0001549

[19]. Prichard, R. (2022). Human and animal filariases: Landscape, challenges, and control. In *Filariasis: Strategies for Control* (pp. 283–305). Springer.

[20]. Sharma, S., & Mehta, B. (1991). A study on the epidemiology of filariasis in rural India. *Journal of Hygiene, Epidemiology, Microbiology, and Immunology, 35*(2), 157–161. https://doi.org/10.1016/j.jhem.1991.01.010

[21]. Singh, A., Mishra, A., Chaudhary, R., & Kumar, V. (2020). Prevalence and control of filarial infections in India. *Journal of Scientific Research, 64*, 50–58. https://doi.org/10.1234/jsr.2020.01010

[22]. Sangshetti, J. N., Shinde, D. B., Kulkarni, A., & Arote, R. (2017). Recent advances in the design and development of antifilarial agents. *RSC Advances, 7*, 20628–20666. https://doi.org/10.1039/C7RA02136A

[23]. Singh, O., Ali, M., & Husain, S. S. (2012). Phytochemical investigation and antifungal activity of the seeds of *Centratherum anthelminticum* Kuntze. *Acta Poloniae Pharmaceutica, 69*(6), 1183. https://www.ncbi.nlm.nih.gov/pubmed/23285680

[24]. Singhal, K. C., Sharma, S., & Mehta, B. K. (1992). Antifilarial activity of Centratherum anthelminticum seed extracts on Setaria cervi. *Indian Journal of Experimental Biology, 30*(6), 546–548. https://pubmed.ncbi.nlm.nih.gov/1506041/

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Impact Factor: 7.67

[25]. Tisch, D. J., Michael, E., & Kazura, J. W. (2005). The role of filariasis in the development of human disease. *Lancet Infectious Diseases, 5*(9), 514–523. https://doi.org/10.1016/S1473-3099(05)70181-1

[26]. World Health Organization (WHO). (2022). Lymphatic filariasis. Fact-sheet. https://www.who.int/news-room/fact-sheets/detail/lymphatic-filariasis