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An Innovative Review on Mosquito-Borne Disease Transmission and Control Using Eco-Friendly Plant-Based Bioactive Compounds and Infertility Methods

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Abstract

Mosquito-borne diseases remain a major global public health concern due to the efficient transmission of pathogens through mosquito bites. Mosquitoes are important vectors of several life-threatening diseases, including malaria, dengue, chikungunya, yellow fever, Zika virus infection, West Nile fever, and lymphatic filariasis. During blood feeding, female mosquitoes inject saliva containing anticoagulants, enzymes, and immunomodulatory compounds that facilitate the entry of pathogens such as viruses, protozoa, and nematodes into the human bloodstream. Rapid mosquito population growth, climate change, urbanisation, the spread of invasive mosquito species, and the development of resistance to conventional insecticides further exacerbate disease transmission, highlighting the urgent need for sustainable and eco-friendly mosquito control strategies.

This review provides an innovative and comprehensive overview of mosquito-borne disease transmission mechanisms with particular emphasis on mosquito saliva-mediated pathogen transfer. It critically examines existing mosquito control methods, including chemical, biological, mechanical, and pharmaceutical approaches, and discusses their limitations such as insecticide resistance, environmental pollution, non-target toxicity, and high operational costs. The review emphasises the role of eco-friendly plant-based bioactive compounds as effective alternatives to synthetic chemical insecticides. Plant secondary metabolites such as alkaloids, terpenoids, flavonoids, phenolics, and essential oils exhibit significant larvicidal, ovicidal, repellent, antifeedant, and growth-regulating activities against mosquito vectors.

In addition, this review highlights infertility-based mosquito control methods, including insect growth regulators, sterile insect techniques, *Wolbachia*-based biological control, and auto-dissemination approaches that disrupt mosquito reproduction and population dynamics. The integration of plant-derived bioactive compounds with sterility methods offers a promising, sustainable, and environmentally safe strategy for mosquito vector control. This integrated approach can significantly reduce mosquito populations, interrupt disease transmission cycles, and contribute to the protection of human health and environmental safety.
Overall, this review underscores the importance of combining phytochemical-based interventions with modern infertility techniques to develop effective and eco-friendly mosquito management strategies.

Keywords: Mosquito-borne diseases; Mosquito saliva; Pathogen transmission; Plant secondary metabolites; Plant-based bioactive compounds; Eco-friendly mosquito control; Larvicidal activity; Ovicidal activity; Mosquito infertility; Sterile insect technique; *Wolbachia*; Vector control; Sustainable pest management.

1. Introduction

In recent decades, increased globalisation, climate change, rapid urbanisation, and human mobility have significantly contributed to the ecological expansion and spatiotemporal distribution of vector-borne diseases worldwide (Dhimal et al., 2015). Arthropod vectors play an important role in the transmission of infectious diseases that can lead to epidemics and pandemics, posing serious challenges to global public health systems (Ramalho-Ortigao and Gubler, 2020). Among these arthropods, mosquitoes (Diptera: Culicidae) are the most significant vectors responsible for transmitting a wide range of pathogens and parasites affecting humans (Benelli et al., 2016).

The major mosquito genera, including *Anopheles*, *Aedes*, and *Culex*, are responsible for the transmission of several life-threatening diseases such as malaria, dengue, yellow fever, lymphatic filariasis, Japanese encephalitis, West Nile fever, and Zika virus infection (Benelli and Mehlhorn, 2016; Saxena et al., 2016). These mosquito-borne diseases continue to be a major public health problem, especially in tropical and subtropical regions. Disease transmission occurs when female mosquitoes feed on human blood and inject saliva containing anticoagulants, enzymes, and immunomodulatory compounds that facilitate pathogen entry into the human bloodstream.

Various mosquito control strategies have been developed to reduce disease transmission, including behavioural, chemical, biological, and mechanical control methods (Benelli et al., 2016). Although these methods have achieved some success, their effectiveness is limited due to several challenges, such as the lack of effective vaccines for many arboviral diseases, delays in antiviral drug development, environmental pollution caused by chemical insecticides, and the rapid development of insecticide resistance in mosquito populations (Batool et al., 2018). In addition, the continuous spread of invasive mosquito species and increased human–mosquito contact has resulted in the re-emergence and spread of several arboviral diseases.

Therefore, there is an urgent need to develop innovative, eco-friendly, and sustainable mosquito control strategies. In recent years, plant-derived bioactive compounds have gained attention as alternative mosquito control agents due to their biodegradable nature, low toxicity to non-target organisms, and wide range of biological activities such as larvicidal, ovicidal, repellent, and growth inhibitory effects (Benelli et al., 2017). These plant secondary metabolites provide an environmentally safe approach for mosquito vector control.

Furthermore, recent advances in nanobiotechnology have opened new possibilities in mosquito control and disease management. Green synthesis of plant-based metallic nanoparticles has shown promising results in mosquito larval control, drug delivery systems, and repellent formulations with improved efficacy, controlled release, and reduced toxicity (Suganya et al., 2017; Magro et al., 2019; Duran et al., 2015). Nanobiotechnology can also be used in the development of biosensors for rapid detection and diagnosis of mosquito-borne viral diseases, which helps in early disease management and prevention (Nicolini et al., 2017).

In addition to plant-based control methods, mosquito infertility control strategies such as insect growth regulators, sterile insect techniques, and biological control methods have emerged as effective approaches to reduce mosquito populations by disrupting their reproductive cycle. The integration of plant-derived bioactive compounds with mosquito infertility methods provides a novel, eco-friendly, and sustainable approach for mosquito vector management and disease control.

Therefore, the objective of this review is to present an overview of mosquito-borne disease transmission, with special emphasis on mosquito saliva-mediated pathogen transmission, and to evaluate eco-friendly mosquito control strategies focusing on plant-derived bioactive compounds and infertility methods for sustainable vector control and public health protection.

2. Literature Collection

A comprehensive literature survey was conducted to collect scientific information related to mosquito-borne diseases, mosquito saliva, plant secondary metabolites, larvicidal activity, mosquito sterility, and vector control strategies. Relevant research articles, review papers, books, and reports were collected from scientific databases such as PubMed, Google Scholar, ScienceDirect, and Web of Science.

2.1 Mosquito-Borne Diseases

Mosquito-borne diseases are among the most serious public health problems affecting millions of people worldwide, particularly in tropical and subtropical regions. These diseases are transmitted by female mosquitoes during blood feeding, through which pathogens such as parasites, viruses, and nematodes enter the human bloodstream. The distribution and incidence of mosquito-borne diseases are influenced by several environmental and socio-economic factors, including climate change, globalization, urbanization, deforestation, and increased human population density.

Climate change plays a major role in the spread of mosquito-borne diseases by influencing temperature, rainfall patterns, and humidity, which directly affect mosquito breeding, survival, and distribution. Changes in environmental conditions allow mosquito vectors to expand into new geographical areas, increasing the risk of disease transmission. Globalization and increased international travel have also contributed to the rapid spread of mosquito-borne pathogens across countries and continents (Dhimal et al., 2015).

Among mosquito-borne diseases, malaria, dengue fever, Zika virus infection, chikungunya, lymphatic filariasis, and Japanese encephalitis are the most important diseases affecting humans. Malaria is transmitted by *Anopheles* mosquitoes and is caused by *Plasmodium* parasites. Dengue, Zika, and chikungunya are viral diseases mainly transmitted by *Aedes aegypti* mosquitoes, while lymphatic filariasis is transmitted by *Culex* mosquitoes. These diseases cause significant morbidity and mortality and create a major economic burden on developing countries (Benelli and Mehlhorn, 2016).

Zika virus is an emerging mosquito-borne viral disease that has gained global attention due to its association with neurological disorders such as microcephaly in newborns and Guillain–Barré syndrome in adults. The rapid spread of Zika virus in many parts of the world highlights the importance of effective mosquito control and disease prevention strategies (Saxena et al., 2016). Mosquito-borne diseases not only affect human health but also impact economic development, agriculture, and social well-being. Therefore, effective mosquito control strategies are essential to reduce disease transmission and protect public health. Understanding the epidemiology, distribution, and transmission mechanisms of mosquito-borne diseases is very important for developing eco-friendly and sustainable vector control methods.

2.2 Mosquito Saliva and Disease Transmission

Mosquito saliva plays a crucial role in the transmission of mosquito-borne diseases. When a female mosquito bites a human for blood feeding, it injects saliva into the host's skin through its proboscis. This saliva contains a complex mixture of bioactive compounds such as anticoagulants, vasodilators, anti-inflammatory agents, enzymes, and immunomodulatory proteins. These substances help the mosquito to obtain blood efficiently by preventing blood clotting, dilating blood vessels, and suppressing the host's immune response.

The anticoagulants present in mosquito saliva prevent blood clotting, allowing continuous blood flow during feeding. Vasodilators help in widening blood vessels, which increases blood availability at the feeding site. Anti-inflammatory compounds reduce pain and inflammation, which prevents the host from immediately detecting the mosquito bite. Immunomodulatory proteins suppress the host immune system and create a favorable environment for pathogen survival and transmission.

Mosquito saliva not only assists in blood feeding but also plays a significant role in pathogen transmission. Many pathogens, including malaria parasites, dengue virus, Zika virus, and filarial worms, are transmitted to humans through mosquito saliva. When an infected mosquito bites a human, the pathogens present in the mosquito salivary glands are injected into the human bloodstream along with saliva. The immunomodulatory components of saliva help pathogens to evade the host immune system and establish infection in the host body.

Research studies have shown that mosquito saliva enhances pathogen infectivity and disease severity by modulating the host immune response. The interaction between mosquito saliva, pathogen, and host immune system is an important factor in disease transmission dynamics. Therefore, understanding the composition and function of mosquito saliva is very important for developing new strategies to prevent mosquito-borne diseases, such as anti-saliva vaccines and novel vector control methods (Ramalho-Ortigao and Gubler, 2020; Benelli et al., 2016).

2.3 Plant bioactive compounds

Plant bioactive compounds, also known as plant secondary metabolites, are naturally occurring chemical substances produced by plants as part of their defense mechanisms against insects, pathogens, and herbivores. These compounds are not directly involved in plant growth and development but play an important role in plant protection. In recent years, plant-based bioactive compounds have gained significant attention as eco-friendly alternatives to synthetic insecticides for mosquito vector control.

Plant secondary metabolites show various biological activities such as insecticidal, larvicidal, repellent, ovicidal, pupicidal, and growth inhibitory effects against mosquito vectors. These compounds affect mosquitoes in different ways, including disruption of the nervous system, inhibition of enzyme activity, damage to the larval cuticle, interference with molting process, inhibition of egg hatching, and disruption of mosquito reproductive systems.

Major classes of plant secondary metabolites used in mosquito control include alkaloids, flavonoids, terpenoids, phenolics, tannins, saponins, and essential oils. Essential oils extracted from aromatic plants belonging to families such as Apiaceae, Lamiaceae, Myrtaceae, Rutaceae, and Asteraceae have shown strong mosquito repellent and larvicidal activity. These essential oils contain active compounds such as limonene, citronellal, eugenol, linalool, and menthol, which are toxic to mosquito larvae and adult mosquitoes.

Plant-based compounds are biodegradable, environmentally safe, and less toxic to non-target organisms compared to synthetic insecticides. Another important advantage of plant secondary metabolites is that they reduce the development of insecticide resistance in mosquito populations because plant extracts contain a mixture of bioactive compounds that act on multiple biological targets in mosquitoes. Therefore, plant-derived insecticides are considered sustainable and effective tools for integrated mosquito vector management. Many studies have reported the larvicidal effectiveness of plant essential oils and plant-borne compounds against mosquito species such as *Aedes aegypti* and *Culex quinquefasciatus* (Benelli et al., 2017).

Thus, plant secondary metabolites play an important role in eco-friendly mosquito control and can be used as larvicides, repellents, ovicides, and growth regulators in integrated vector management programs. (Table-1).

Table 1: Plant Secondary Metabolites and Their Role in Mosquito Control

S. No	Secondary Metabolite	Plant Source (Examples)	Active Compounds	Effect on Mosquito
1	Alkaloids	*Rauvolfia, Datura, Nicotiana*	Nicotine, Reserpine	Neurotoxic, insecticidal
2	Flavonoids	*Azadirachta indica, Citrus spp.*	Quercetin, Rutin	Growth inhibition
3	Terpenoids	*Eucalyptus, Lemongrass*	Limonene, Citronellal	Repellent, larvicidal
4	Phenolics	*Ocimum sanctum, Neem*	Eugenol	Larvicidal, antimicrobial
5	Tannins	*Acacia spp., Tea plant*	Tannic acid	Feeding deterrent
6	Saponins	*Soapwort, Quillaja*	Saponin	Larval mortality
7	Essential Oils	*Mentha, Lavandula, Eucalyptus*	Menthol, Linalool	Repellent, larvicidal
8	Steroids	*Calotropis*	Cardiac glycosides	Growth regulator
9	Glycosides	*Nerium, Digitalis*	Oleandrin	Toxic to larvae
10	Fixed Oils	*Neem, Pongamia*	Azadirachtin	Ovicidal, larvicidal

2.4 Larvicidal Activity

Larvicidal activity is one of the most effective methods for controlling mosquito populations because it targets mosquitoes at the larval stage before they develop into adult mosquitoes. Controlling mosquito larvae is easier and more effective than controlling adult mosquitoes because larvae live in water and are confined to specific breeding habitats such as ponds, stagnant water, drains, containers, and wetlands. Therefore, larval control plays an important role in reducing mosquito population and preventing mosquito-borne disease transmission.

Many research studies have reported that plant extracts, essential oils, and plant-based nanoparticles show strong larvicidal activity against mosquito larvae such as *Aedes aegypti*, *Anopheles stephensi*, and *Culex quinquefasciatus*. Plant-derived larvicides contain bioactive compounds such as alkaloids, terpenoids, flavonoids, phenolics, and essential oils, which are toxic to mosquito larvae. These compounds enter the larval body through the cuticle, digestive system, or respiratory system and affect the normal physiological functions of larvae, leading to larval death.

Plant-based larvicides act through different mechanisms such as disruption of the larval nervous system, inhibition of enzyme activity, interference with molting process, damage to the midgut epithelium, and disruption of hormonal control of larval development. Some plant compounds act as insect growth regulators and prevent larvae from developing into pupae and adults. As a result, mosquito population growth is reduced significantly.

In recent years, plant-based nanoparticles such as silver nanoparticles, gold nanoparticles, and polymer-coated nanoparticles synthesized using plant extracts have shown highly effective larvicidal activity. These nanoparticles increase the toxicity and stability of plant bioactive compounds and provide controlled release of active compounds in water, resulting in higher larval mortality. Studies have shown that plant-mediated nanoparticles are more effective than crude plant extracts in mosquito larval control.

Plant-based larvicides are biodegradable, eco-friendly, and safe to non-target organisms such as fish, aquatic insects, and humans. They do not cause environmental pollution and reduce the development of insecticide resistance in mosquito populations. Therefore, plant-based larvicides and plant-derived nanoparticles are considered promising tools for eco-friendly mosquito control and integrated vector management programs.

2.5 Mosquito Sterility and Infertility Methods

Mosquito sterility and infertility methods are important vector control strategies that reduce mosquito populations by preventing reproduction rather than directly killing mosquitoes. These methods are considered environmentally friendly and species-specific, making them suitable for integrated mosquito management programs. The main objective of sterility methods is to interfere with mosquito mating, egg development, egg hatching, or larval development, thereby reducing the next generation of mosquitoes.

One of the most important sterility methods is the **Sterile Insect Technique (SIT)**. In this method, male mosquitoes are sterilized using radiation or genetic modification and released into the environment. When sterile male mosquitoes mate with female mosquitoes, no viable offspring are produced, which leads to a gradual reduction in mosquito population.

Another important method is the use of **Insect Growth Regulators (IGRs)**. These chemicals interfere with the growth and development of mosquito larvae by disrupting molting and metamorphosis. IGRs mimic juvenile hormones or inhibit chitin synthesis, which prevents larvae from developing into adult mosquitoes.

Table-2 Mosquito Sterility and Infertility Control Methods

S. No	Method	Agent Used	Mode of Action	Effect on Mosquito
1	Sterile Insect Technique (SIT)	Radiation / Genetic modification	Sterilizes male mosquitoes	No offspring produced
2	Insect Growth Regulators (IGRs)	*Methoprene, Pyriproxyfen*	Disrupt molting and development	Prevent adult emergence
3	Biological Control	*Bacillus thuringiensis*	Produces larval toxins	Larval death
4	Wolbachia Method	Wolbachia bacteria	Cytoplasmic incompatibility	Egg hatching failure
5	Chemosterilants	Plant extracts	Affect reproductive system	Reduce fertility
6	Genetic Control	Gene editing	Produce sterile mosquitoes	Population suppression

Biological control methods also play an important role in mosquito infertility control. Certain bacteria such as *Bacillus thuringiensis* and *Wolbachia* bacteria infect mosquitoes and reduce their reproductive capacity. *Wolbachia* infection, for example, causes cytoplasmic incompatibility, which prevents egg hatching and reduces mosquito population.

Some plant bioactive compounds also act as **chemosterilants**, which reduce mosquito fertility by affecting egg production, egg viability, and reproductive hormones. These plant-based sterility agents are eco-friendly and biodegradable.

These sterility and infertility methods are useful because they reduce mosquito population without causing environmental pollution and without harming non-target organisms. Therefore, mosquito sterility methods are considered important tools in integrated vector management programs (Batool et al., 2018). (Table-2).

3. Analysis and Comparison

Mosquito control methods mainly include chemical control and plant-based control methods. Chemical insecticides such as organophosphates, pyrethroids, and carbamates are widely used for mosquito control because they provide quick results and immediate mosquito mortality. However, continuous use of chemical insecticides leads to several problems such as environmental pollution, toxicity to non-target organisms, development of insecticide resistance in mosquitoes, and harmful effects on human health.

In contrast, plant-based control methods use plant extracts, essential oils, and plant secondary metabolites for mosquito control. Plant-based insecticides are biodegradable, eco-friendly, and safe for non-target organisms. They contain multiple bioactive compounds that act on different biological systems of mosquitoes, reducing the chances of resistance development. Although plant-based insecticides may act slower than chemical insecticides, they provide long-term and sustainable mosquito control without environmental damage. Therefore, plant-based control methods are considered safer and more environmentally friendly than chemical control methods.

3.1 Comparison Between Sterility Control and Insecticide Control

Sterility control methods and insecticide control methods are both used to reduce mosquito populations, but they work in different ways. Insecticide control methods kill mosquito larvae or adult mosquitoes directly, providing immediate results. However, repeated use of insecticides leads to resistance development and environmental contamination.

Sterility control methods, such as sterile insect technique, insect growth regulators, and biological control methods, reduce mosquito population by preventing reproduction and egg hatching. These methods do not kill mosquitoes immediately but reduce the mosquito population gradually over time. Sterility methods are species-specific, environmentally safe, and do not cause pollution. They are particularly useful for long-term mosquito control programs.

3.2 Identification of Best Eco-Friendly Method

Based on the analysis and comparison, eco-friendly mosquito control methods should be safe, biodegradable, target-specific, cost-effective, and sustainable. Plant-based larvicides and repellents are effective in controlling mosquito larvae and preventing mosquito bites, while sterility methods help in reducing mosquito reproduction and population growth.

Therefore, the best eco-friendly mosquito control strategy is the **integrated approach**, which combines plant-based bioactive compounds, larvicidal plant extracts, plant-based nanoparticles, and mosquito sterility methods such as sterile insect technique and biological control. This integrated vector management approach provides effective, environmentally safe, and sustainable mosquito control and helps in reducing mosquito-borne disease transmission.

4. Conclusion and Future Prospects

Mosquito-borne diseases continue to be a major public health problem worldwide, particularly in tropical and subtropical regions. The transmission of these diseases is closely associated with mosquito vectors, their feeding behaviour, and the role of mosquito saliva in pathogen transmission. Conventional mosquito control methods mainly rely on chemical insecticides, which, although effective, lead to environmental pollution, toxicity to non-target organisms, and the development of insecticide resistance in mosquito populations. Therefore, there is an urgent need to develop eco-friendly, sustainable, and effective mosquito control strategies.

Plant-based bioactive compounds have emerged as promising alternatives to chemical insecticides due to their biodegradable nature, low toxicity, environmental safety, and multiple modes of action against mosquitoes. Plant secondary metabolites such as alkaloids, flavonoids, terpenoids, phenolics, and essential oils have shown significant larvicidal, repellent, ovicidal, and growth inhibitory activities against mosquito vectors. In addition, plant-based nanoparticles have demonstrated enhanced larvicidal activity and improved stability of bioactive compounds, making them effective tools for mosquito control. Mosquito sterility and infertility methods, such as sterile insect technique, insect growth regulators, and biological control methods, provide another eco-friendly approach for mosquito population control by reducing mosquito reproduction and population growth. These methods are species-specific, environmentally safe, and suitable for long-term mosquito control programs.

The analysis and comparison of different mosquito control methods indicate that an integrated vector management approach is the most effective and eco-friendly strategy. The combination of plant-based larvicides, plant bioactive compounds, nanoparticle-based formulations, and mosquito sterility methods can provide sustainable mosquito control and reduce mosquito-borne disease transmission.

Future Prospects

Future research should focus on the identification and isolation of new plant bioactive compounds with high mosquito larvicidal and repellent activity. More studies are needed on the green synthesis of plant-based nanoparticles for mosquito control. Research should also focus on the development of mosquito anti-saliva vaccines, biosensors for early detection of mosquito-borne pathogens, and genetic control methods for mosquito population suppression.

Field-level studies and large-scale implementation of plant-based mosquito control methods are necessary to evaluate their effectiveness under natural environmental conditions. In addition, public awareness programs and community participation are very important for successful mosquito control programs.

In conclusion, eco-friendly plant-based bioactive compounds and mosquito infertility methods offer a sustainable, environmentally safe, and effective approach for mosquito vector control. The integration of botanical insecticides with modern sterility and nanotechnology-based approaches represents a promising strategy for the future management of mosquito-borne diseases and protection of public health.

References

Batool, K., Alam, I., Wu, S., Liu, W., Zhao, G., Chen, M., Wang, J., Xu, J., Huang, T., & Pan, X. (2018). Transcriptomic analysis of *Aedes aegypti* in response to mosquitocidal *Bacillus thuringiensis* toxin. Scientific Reports, 8, 12650.

Benelli, G., & Mehlhorn, H. (2016). Declining malaria, rising dengue and Zika virus: Insights for mosquito vector control. Parasitology Research, 115, 1747–1754.

Benelli, G., Jeffries, C. L., & Walker, T. (2016). Biological control of mosquito vectors: Past, present, and future. Insects, 7, 52.

Benelli, G., Pavela, R., Iannarelli, R., Petrelli, R., Cappellacci, L., Cianfaglione, K., Afshar, F., Nicoletti, A., Canale, A., & Maggi, F. (2017). Synergized mixtures of Apiaceae essential oils: Larvicidal effectiveness against *Culex quinquefasciatus.* Industrial Crops and Products, 96, 186–195.

Dhimal, M., Ahrens, B., & Kuch, U. (2015). Climate change and spatiotemporal distributions of vector-borne diseases in Nepal—A systematic synthesis of literature. PLoS ONE, 10, e0129869.

Duran, N., Islan, G. A., Duran, M., & Castro, G. R. (2015). Nanobiotechnology solutions against *Aedes aegypti*. SAE International Journal of Materials and Manufacturing, 9, 158–170.

Magro, M., Bramuzzo, S., Baratella, D., Ugolotti, J., Zoppellaro, G., Chemello, G., Olivetto, I., Ballarin, C., Radaelli, G., & Arcaro, B. (2019). Self-assembly nanoparticles for larvicidal activity against *Aedes aegypti.* Journal of Photochemistry and Photobiology B: Biology, 194, 21–31.

Nicolini, A. M., McCracken, K. E., & Yoon, J. Y. (2017). Future developments in biosensors for field-ready Zika virus diagnostics. Journal of Biological Engineering, 11, 7.

Ramalho-Ortigao, M.; Gubler, D.J. Human Diseases Associated with Vectors (Arthropods in Disease Transmission); Elsevier Inc.: Amsterdam, The Netherlands, 2020; Volume 30, pp. 1063–1069.

Saxena, S. K., Elahi, A., Gadugu, S., & Prasad, A. K. (2016). Zika virus outbreak: An overview of the experimental therapeutics and treatment. Virus Disease, 27, 111–115.

Suganya, P., Vaseeharan, B., Vijayakumar, S., Balan, B., Govindarajan, M., Alharbi, N. S., Kadaikunnan, S., Khaled, J. M., & Benelli, G. (2017). Biopolymer zein-coated gold nanoparticles: Synthesis and larvicidal activity against *Aedes aegypti.* Journal of Photochemistry and Photobiology B: Biology, 173, 404–411.

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