

Anti-inflammatory Benefits of Plants and Their Effect on Mosquito Bites

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Abstract

Both orange peels and aloe vera contain anti-inflammatory properties. Orange peels contain hydroxylated PMFs (OH-PMFs) and Polymethoxy flavones (PMFs). Both are bioactive against inflammation. The two effectual Proton Motive Forces (PMFs) in orange peels are nobiletin and tangerine, both in the flavonoid family. Flavonoids are phytochemical compounds in plants with viable applications in medicinal chemistry. Flavonoids incorporate numerous medicinal advantages, including antioxidant, anticancer, antiviral properties, and anti-inflammatory. When both are rubbed onto the affected area, the histamine that is released to the mosquito bite will slow and regulate which will help reduce the irritation to the allergic reaction. Phytochemicals are a variety of nonnutritive chemical compounds that are confirmed to retain many advantages in health effects. Some benefits of the contact or intake of phytochemicals are benefiting the function of the immune system, defending cells and DNA from impairment that may steer towards cancer, decreasing inflammation, hindering the development rate of cancer cells, and supporting regulated hormones. Many Phytochemicals are color compounds found in high concentrations in the outer layer of plant tissues. Orange peels and Aloe Vera contain Flavonoids known as a phytochemical. Our group wanted to find safe and effective at-home remedies that will be beneficial to users, and will show results in helping relieve irritation (redness, swollen, itchy).

Introduction

When a mosquito bites an individual, it emits its saliva into the bloodstream. The cause of the irritations is due to the saliva components in the human body's cutaneous tissue. An individual's body will identify the saliva as an allergen. The body's immune system will respond to this and transmit a chemical known as histamine to the affected area. Histamine is held in cytoplasmic granules along with other amines. The chemical histamine is the cause of the irritation of mosquito bites. Histamine is a signaling chemical in an individual's immune system; it will send messages between cells. Aloe Vera and Orange Peels contain anti-inflammatory properties (PMFs, Vitamin A, Auxins, Nobiletin, Tangerine) that will relieve irritation of mosquito bites, by balancing and slowing down the release of Histamine.

Materials and Methods

In this project examination, multiple keywords were cited utilizing academic search engines. The keywords are listed but not restricted to; Histamine, Aloe Vera, Orange peels (Polymethoxy flavones, nobiletin, tangeretin), and anti-inflammatory. The most widespread search engines demonstrated to be reliable include Google Scholar and Proquest. Most research evidence was found associated with the anti-inflammatory benefits of certain plants and their influences on mosquito bites. The research was based on why and how mosquito bites evolve irritated, and the advantages that come with plant-derived "natural remedies". Articles were discovered to relate closely to the hypothesis and to uncover the conclusion. Studies were proven accommodating as they delivered evidence of how chemicals in plants do have an anti-inflammatory influence on mosquito bites.

Results

When the chemical histamine is released to the affected area, the anti-inflammatory properties found in orange peels (Nobiletin, Tangeretin) and aloe vera (PMFs, Vitamin A, Auxins) help balance the release of histamine and help the chemical slow down. The chemical histamine is contained in the human body's mast cells. Allergies are the human body's reaction towards unfamiliar proteins. "The D7 proteins, which are a subtype of odorant-binding proteins and abundant in mosquito saliva, were found to be the major allergenic proteins across mosquito species" (Does, Labib, Yosipovitch, 2022). The body's immune system will respond to these unidentified proteins and send the histamine to the affected area. Histamine regulates bodily processes and affects the body's inflammatory response. "Histamine is thought to be a key player through mosquito saliva itself or activation of mast cells by IgE or through an IgE-independent pathway" (Does, Labib, Yosipovitch, 2022). Mosquito bites can be excessively detrimental when not appropriately taken into consideration. Mosquitoes are known to maintain borne diseases, including West Nile virus, Zika Virus, brain infections, yellow fever, and the viruses that cause malaria. Taking the proper precautions and care to prevent or treat mosquito bites is vital. Anti-inflammatory properties balance histamine departure from mast cells rendered by fibrinogen degradation developments.

Conclusions

The data that was thoroughly researched has supported the idea that anti-inflammatory properties (PMFs, Vitamin A (beta keratin), Auxins, nobiletin, and tangerine) in orange peels and aloe vera help relieve mosquito bites. The histamine that is transported to the affected area from the mast cells, will be regulated and controlled when orange peels and aloe vera is applied to the area. Properties found in both have been proven to accelerate wound healing. Applying orange peels and aloe vera to mosquito bites is a significantly easier way to relieve any irritation and discomfort. They are safe at-home remedies that can be easier than getting medication for discomfort. The remedies have been proven on multiple accounts to help regulate the histamine in the affected area, relieve any irritation, and accelerate the healing process. The anti-inflammatory properties will inhibit any further stages of the area from worsening in any way. Mosquito bites can be excessively detrimental when not appropriately taken into consideration. Mosquitoes are known to maintain borne diseases, including West Nile virus, Zika Virus, brain infections, yellow fever, and the viruses that cause malaria. Taking the proper precautions and care to prevent or treat mosquito bites is vital. Anti-inflammatory properties balance histamine departure from mast cells rendered by fibrinogen degradation developments.

References

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- Author links open overlay panel Alexander Gossiau a b, a, b, c, d, & AbstractIn view of the potential of polymethoxyflavones (PMFs) and hydroxylated PMFs (OH-PMFs) as bioactives against inflammation. (2014b, February 28). Anti-inflammatory effects of characterized orange peel extracts enriched with bioactive polymethoxyflavones. Food Science and Human Wellness. <https://www.sciencedirect.com/science/article/pii/S2213453014000056>
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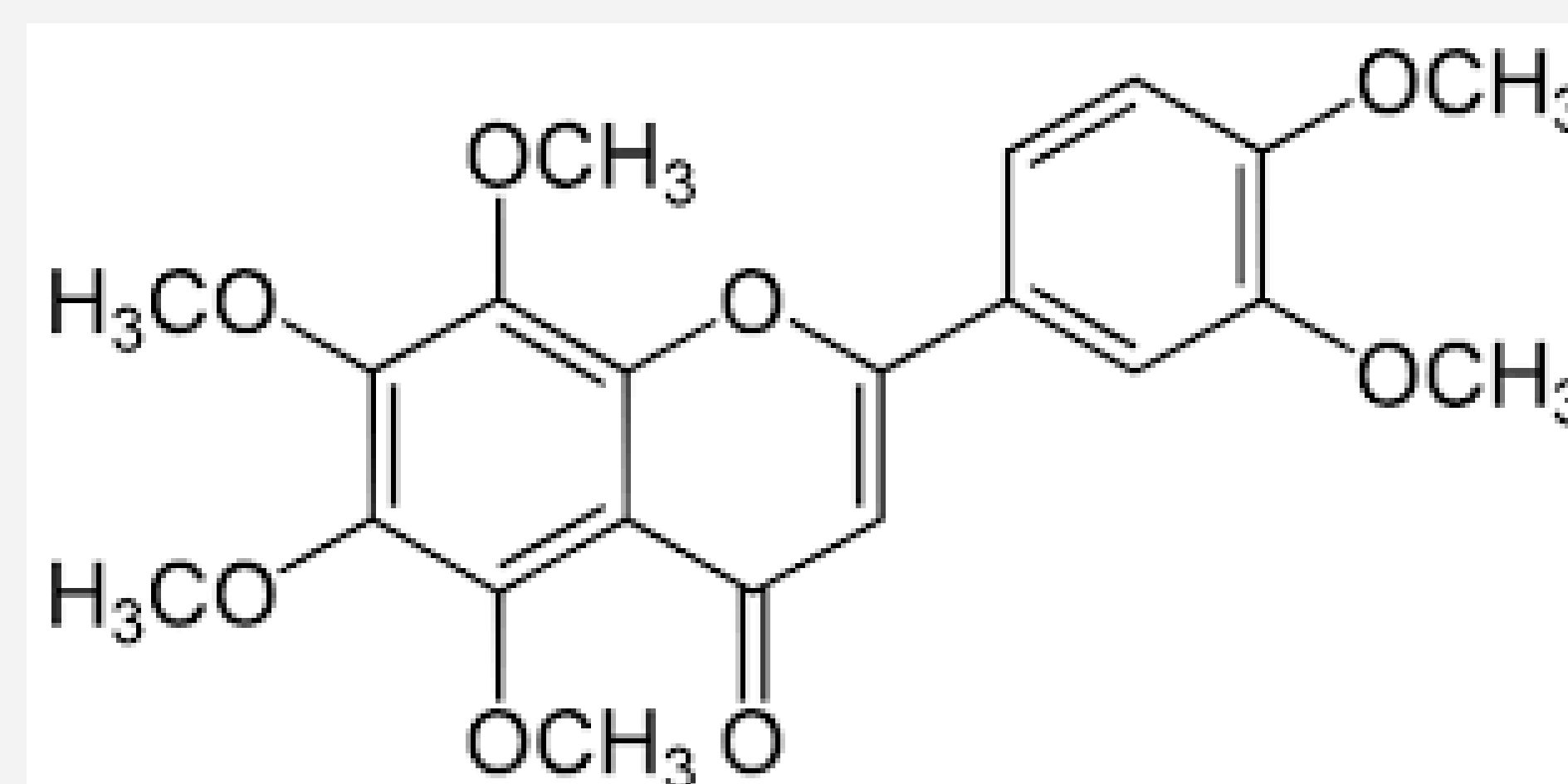


Figure 1. Polymethoxy flavones (PMFs) and hydroxylated PMFs (OH-PMFs) are bioactive against inflammation (almost exclusively in orange peels)

Histamine | C₅H₉N₃

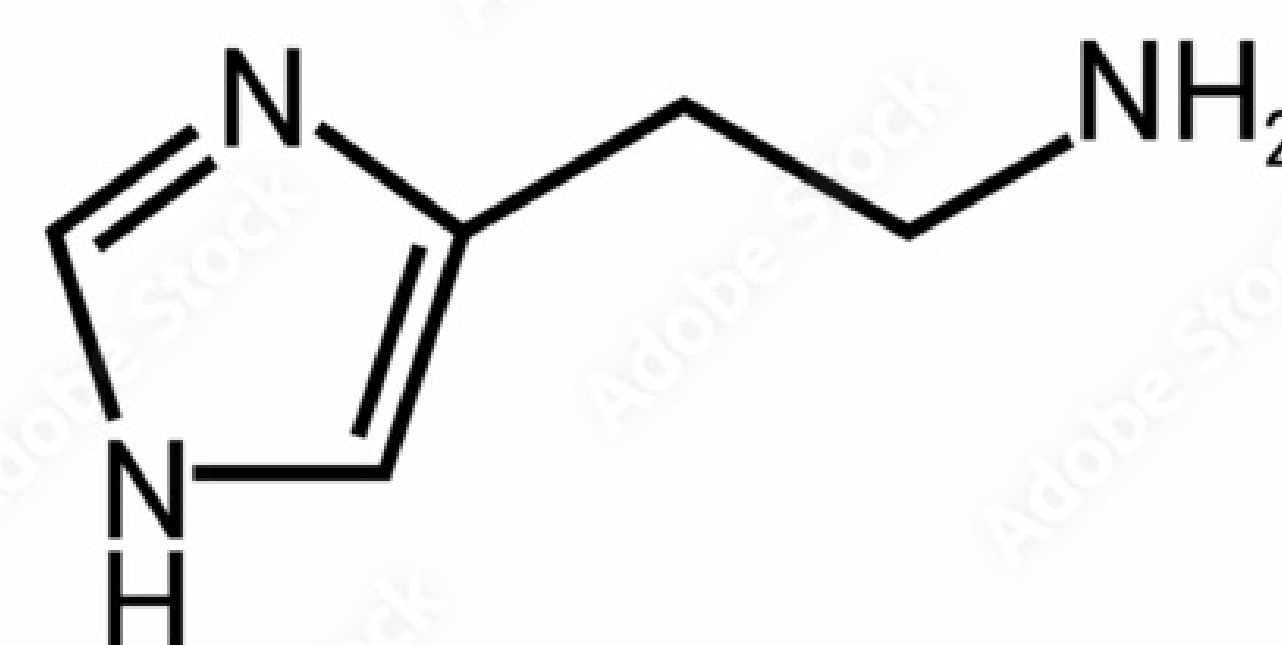


Figure 2. Histamine is the chemical in individuals immune system, that will release when the body is exposed to unknown proteins.

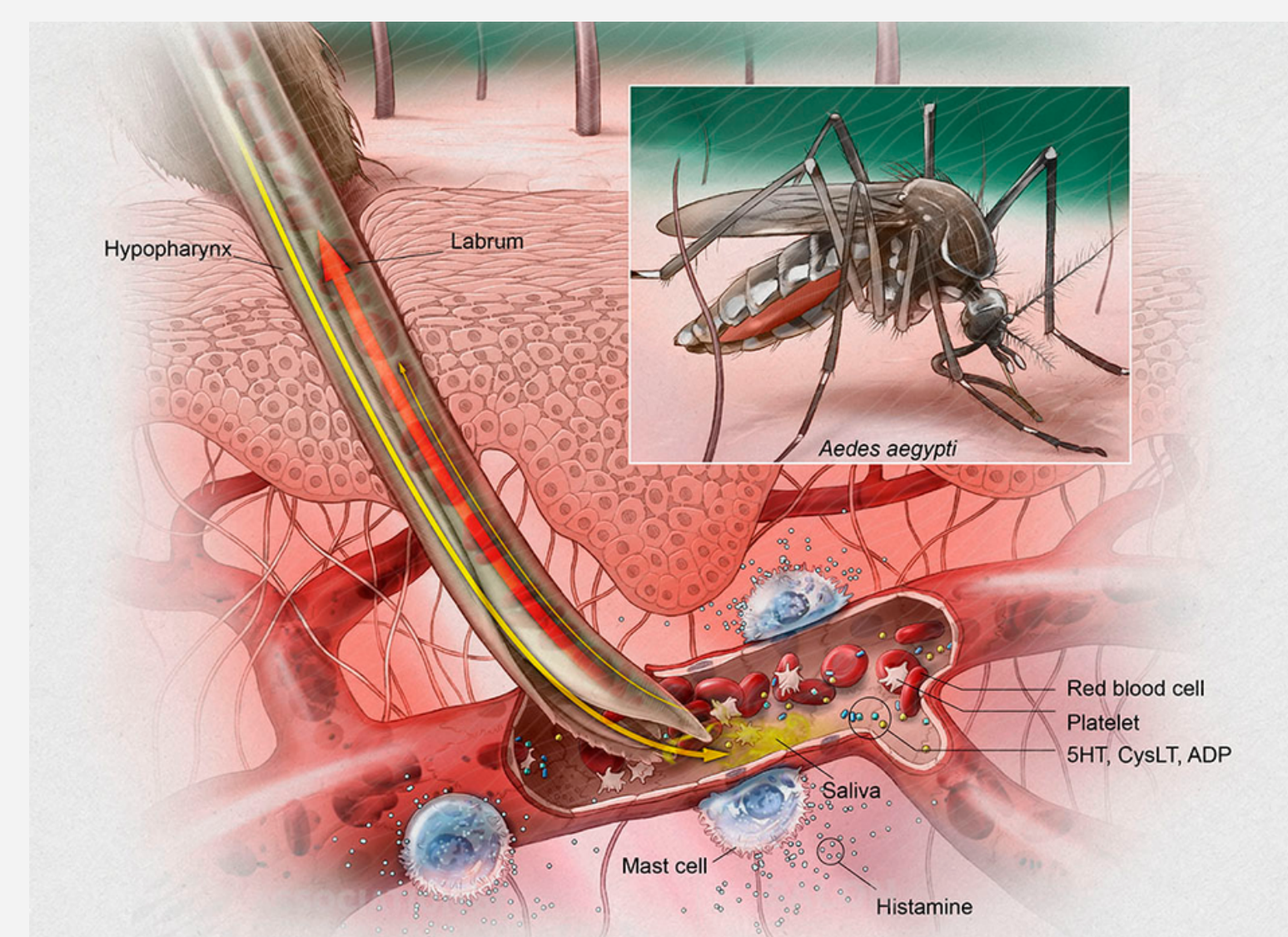


Figure 3. Visual of a mosquito bite and the pathophysiological reactions of the bite. Mast cells induce an inflammatory cascade and release inflammatory mediators into the extracellular space. —When saliva goes into the body, it reacts and sends histamines to the bite causing inflammation and redness.