



## ORIGINAL ARTICLE

# Utilization of a Non - Polar Agent against *Achea catacoloides* Caterpillar Induced Urticaria

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### ABSTRACT

In June, 2007, people reported pain, itching and rashes after coming into contact with caterpillars (locally known as Sosa-Gaye), in towns like Jibia, Dankama, Baure, Mai-Adua, Katsina etc. Some substances were tested against the allergic reactions of caterpillar e.g. Soaps (Joy™ and pale Key™ soaps), granut oil, potash, glycerine™, vasiline™ pomade, Kerosine, luxury and medicated talc powder, palm oil and distilled water (control). Twenty eight volunteers served as the experimental group A while two volunteers (a male and a female) served as control group B. The experimental group were administered a skin prick of live caterpillar, on the arm, leg and neck. After five minutes, each volunteer was administered only one of the above listed substances at the same point of skin prick. Response and reactions were observed and recorded over a period of 48 hours. Distilled water was used as the control. The most effective substance against the caterpillar induced symptoms was palm oil (*Elaeis guineensis*), which was able to prevent and completely stop the itching, rash, redness of skin and pain, within 30 minutes. Consequently Palm oil (*Elaeis guineensis*) is effective against caterpillar induced urticaria.

**Key words:** Caterpillar, *Elaeis guineensis*, outbreak, urticaria

Received 22/09/2013 Accepted 08/11/2013

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### INTRODUCTION

An outbreak of painful excruciating itching has been reported in some towns in Katsina State in places like Jibia, Dankama, Baure, Mai-Adua, Katsina etc. People reported pain, itching and rashes after coming into contact with caterpillars (locally known as Sosa-Gaye). The urticating or "stinging" spines and setae of some caterpillars are a well-known chemical defense found in several families of Lepidoptera, especially Megalopygidae, Limacodidae, Saturniidae, and a few Nymphalidae, Anthelidae, Lasiocampidae, Bombycidae, Eupterotidae, Lymantriidae, Arctiidae, and Noctuidae [1],[2],[3],[4]. Toxicity in Lepidoptera is also found in adults, where scales may be urticating in some families (Notodontidae: Thaumetopoeinae, Lymantriidae, Arctiidae, and Saturniidae) or where integumental glands produce an urticating chemical (Zygaenidae and Arctiidae) [5].

The puss caterpillar capable of producing an extreme stinging sensation, along with extensive swelling that lasted several hours [6],[7],[8]. Poison glands in urticating Lepidoptera are mainly of interest for their effect on humans, or lepidopterism as it is called [4]. Persons of average sensitivity experience stinging sensations from touching the spines which contain poison glands. Persons of extreme sensitivity can experience severe pain and allergic reactions. Cases are known of hospitalization being required due to severe dermatitis. Severe allergic reactions could cause death in extreme cases. Skin bleeding results from contact with saturniid caterpillars (*Lonomia achelous* (Cramer)) in Venezuela, which have poison spines containing an anticoagulant [9]. Cases of allergic reactions to Lepidopteran adults and larvae have been reported where workers handled larvae or inhaled excessive numbers of dislodged urticating scales from adult moths (e.g. *Hemileuca* and *Hylesia* spp.), resulting in dermatitis or asthma-like reactions [4].

There are many treatments against urticaria but virtually all have one shortcome or another, as enumerated below. First of all, treatment depends on which type or types of urticaria you have. Oral antihistamines control wealing and itching for the majority of patients with urticaria. They do not affect the underlying cause of the rash. Antihistamines may need to be taken intermittently or continuously until the underlying tendency to urticaria disappears [10].

Furthermore, non-sedating antihistamines (loratidine, fexofenadine, terfenadine, cetirazine, and astemizole) are less likely to cause drowsiness than the less expensive conventional antihistamines. They may be unsuitable in pregnancy. Terfenadine and astemizole may increase the risk of abnormal heart rhythms. They should be avoided if you have heart disease or you are also taking erythromycin, ketoconazole and some other medications. Fexofenadine, loratidine, desloratidine and cetirazine are safe [10].

Sometimes if the first antihistamine taken is not effective, You may need to increase the dose, or use a different drug. Sometimes a combination of antihistamines works better than a single type alone. Adding H<sub>2</sub> blockers such as cimetidine and ranitidine can also reduce urticaria but these medications are more often prescribed to reduce stomach acidity.

There are some urticaria that cannot be cleared with antihistamines, this may be helped by: Oral steroids (prednisone), useful for severe acute urticaria but unsuitable long term, because of serious adverse effects. Ultraviolet radiation treatment (narrowband UVB or PUVA). Antibiotics and antifungal agents, used to clear an assumed underlying infection or for non-specific anti-inflammatory action. But their usage can lead to drug resistance [10].

Immunosuppressive medications (ciclosporin, plasmapheresis). Antifibrinolytic agents (tranexamic acid, androgenetic steroids such as danazol) are used against urticaria but they are not suitable for pregnant women. Tricyclic medications such as amitriptyline, nortriptyline and doxepin (which have antihistaminic and neuropathic properties), may not be appropriate for people with high blood pressure [10].

The above shortcomings of the various available anti-urticaria, necessitates the present study whose objective is discover a cheap, locally and easily available remedy for the intense itching, rashes, redness of skin and the intense pain that occur as a results of contact with caterpillars.

## MATERIAL AND METHODS

The efficacy of some substances against the allergic reactions manifested after contact with caterpillar was tested. These substances were; two types of soaps (with trade names, Joy™ and pale Key™ soap), granut oil, glycerine, vasiline pomade, Kerosine, luxury and medicated talc powder and Palm oil from the palm plant (*Elaeis guineensis*) and distilled water (which served as the control). Thirty volunteers participated in the study, that is, 20 males and 10 females between the ages of 18 to 42. Twenty eight volunteers served as the experimental group A while two volunteers (a male and a female) served as control group B. Each of those in group A were made to wash their hands thoroughly with a soap, before starting the experiment and their hands were left to stand alone for 30 minutes, so as to remove any effect of the detergent. All were instructed not to take any medication prior to the skin prick. Each of the volunteers in group A were administered a skin prick of live caterpillar, on the arm, leg and neck. Five minutes was allowed for the itching sensation to start, thereafter each volunteer was administered only one of the above listed substances. Response and reactions were observed and recorded every 30 minutes, by the particular volunteer, for a period of 24 hours. Distilled water was used on the control group.

## RESULT

The most effective substance against the caterpillar induced symptoms was palm oil (*Elaeis guineensis*), which was able to completely stop within 30 minutes, all the caterpillar induced symptoms such as itching, rashes, redness of skin and pain (urticaria). It was followed by Key™ soap, Joy™ soap, Granut oil, Vaseline™ and glycerine™, which allowed moderate itching for a period of upto 7 hours and only slight itching after 24 hours. The distilled water had no effect on the caterpillar induced symptoms (TABLE I).

## DISCUSSION

This study shows that palm oil (*Elaeis guineensis*) can be utilized both as a preventive as well as a curative agent against urticaria caused by contact with *Achae catacoloides* caterpillar. Because if it is first applied on the skin even before the caterpillar skin prick test, it was able to completely prevent the itching, rashes, redness of the skin and pain that would be experienced as a result of contact with caterpillars. During the study it was observed that some volunteers show mild to moderate allergic reactions while a few showed adverse reactions. It was also observed that most of the female volunteers showed mild allergic reactions.

The symptoms experienced by people after contact with caterpillars are consistent with urticaria which according to Greaves [12] features an area of central redness, on which is superimposed an irregular wheal, caused by local edema, and surrounded by a bright pink flare. He further added that the reaction is due to release of histamine from cellular stores within the skin and is usually accompanied by itching [12]. In addition, the histamine in the hairlike structures on nettle leaves (similar to the hairlike

structures of caterpillars) is partly responsible for the swelling and itching produced by contact with them. Histamine is also the irritating ingredient present in the venom of many species of wasps and bees [13].

TABLE I: Substances tested and their reactions against caterpillar induced urticaria

S/N	Time/ Reaction				
	Substance	30 min	1 hr	7 hrs	24 hrs
1.	Joy soap	Intense itching	Intense itching and pain	Moderate itching, rashes, redness of skin, pain	Slight itching, rashes, redness of skin. No pain
2.	Key soap	Moderate itching	Moderate itching, Intense pain	Moderate itching, rashes, redness of skin, pain	Slight itching, rashes, redness of skin. No pain
3.	Granut oil	Moderate itching	Moderate itching, Intense pain	Moderate itching, rashes, redness of skin, pain	Slight itching, rashes, redness of skin. No pain
4.	Vaseline	Moderate itching	Intense itching Intense pain	Moderate itching, rashes, redness of skin, pain	Slight itching, rashes, redness of skin. No pain
5.	Glycerine	Moderate itching	Intense itching, Intense pain	Moderate itching, rashes, redness of skin, pain	Slight itching rashes, redness of skin. No pain
7.	Kerosine	Intense itching	Intense itching, Intense pain	Moderate itching, rashes, redness of skin, pain	Moderate itching rashes, redness of skin. No pain
8.	Potash	Moderate itching	Moderate itching, Intense pain	Moderate itching, rashes, redness of skin, pain	Moderate itching rashes, redness of skin. No pain
9.	Medicated talc powder	Moderate itching	Intense itching and pain	Moderate itching, rashes, redness of skin, pain	Moderate itching rashes, redness of skin. No pain
10.	Palm oil	No itching, rashes, redness of skin, nor pain	No itching, rashes, redness of skin, nor pain	No itching, rashes, redness of skin, nor pain	No itching, rashes, redness of skin, nor pain.
11.	Distiled Water	Intense itching Rashes, redness of skin	Intense itching and pain	Intense itching Rashes, redness of skin and pain	Intense itching rashes, redness of skin and pain.

In an allergic reaction—the immune system's hypersensitivity reaction to usually harmless foreign substances (called antigens in this context) that enter the body -mast cells- is to release histamine in inordinate amounts. Immune system proteins called antibodies, which are bound to mast cells, bind to the antigens to remove them, but in the process the mast cells are stimulated to release their histamines. This causes the visible symptoms of a localized allergic reaction, including runny nose, watery eyes, constriction of bronchi, and tissue swelling [12].

In addition, Histamine also increases the permeability of the walls of the capillaries so that more of the constituents of plasma can escape into tissue spaces, leading to an increase in the flow of lymph and its protein content and to the formation of edema. These effects are manifested in the redness and rash associated with histamine release, as may occur after a scratch from a blunt instrument or a bee sting and probably on contact with caterpillars [13]. Based on the afore-mentioned one can speculate that Palm oil, a non-polar agent, is able to block histamine and prevent it from acting in a manner as to produce allergic reactions in people that came into contact with caterpillars.

## CONCLUSION

The palm oil, has been very effective against the itching, rashes and pain that resulted from contact with caterpillars, however it is the opinion of the author that further research needs to be carried out to determine its chemistry and physiology in man. More research should also be conducted to determine the chemistry between the palm oil and histamine and how they relate to the caterpillar induced urticaria.

## REFERENCES

1. Riley, W.A., and Johannsen, O.A. (1938). *Medical Entomology; a Survey of Insects and Allied Forms Which Affect the Health of Man and Animals*. McGraw-Hill, New York, 483 p.
2. Matheson, R. (1950). *Medical Entomology*. (2nd ed.). Comstock Publications, Ithaca, New York, 612 p.
3. Roth, L.M, and Eisner, T. (1962). Chemical defenses of arthropods. *Annual Review of Entomology* **7**: 107-136.
4. Wirtz, R.A. (1984). Allergic and toxic reactions to non-stinging arthropods. *Annual Review of Entomology*, **29**: 47-69.
5. Rothschild, J; Reichstein, T; von Euw J; Aplin, R. and Harman, R.R.M. (1970). Toxic lepidoptera. *Toxicon* **8**: 293-299.
6. Murtfeldt, M.E (1876). An experiment with a stinging larva. *Canadian Entomologist* **8**: 201-202.
7. Frazier, C.A. (1969). *Insect Allergy*. Allergic and Toxic Reactions to Insects and other Arthropods. W.H. Green, St. Louis. pp493.
8. Frazier C.A. and Brown, F.K (1980). *Insects and allergy and what to do about them*. University of Oklahoma Press, Norman. pp27.
9. Marsh, N.A., and Arocha-P, C.L (1971). Observations on a saturniid moth caterpillar causing severe bleeding in man. *Proceedings of the Royal Entomological Society of London* **36**: 9-10.
10. Derm Net NZ (2007). Urticaria (Hives). New Zealand Dermatological Society Incorporated. [http://www./Urticaria/angioedema/\(hives\)/DermNet/NZ](http://www./Urticaria/angioedema/(hives)/DermNet/NZ).
11. Balit, C.R., Geary, M.J., Russell, R.C., Isbister, G.K (2003). Prospective study of definite caterpillar exposures. *Toxicon*. **42**(6):657-62.
12. Greaves, M.W. (Ed.) Skin Disease (2010). Encyclopedia Britannica. *Encyclopedia britannica Ultimate Reference Suite*. Chicago: Encyclopedia Britannica.
13. Rang, H.P. Histamine. Encyclopedia Britannica (2010). *Encyclopedia Britannica Ultimate Reference Suite*. Chicago: Encyclopedia Britannica.

## Citation of This Article

Mohammed, Aliyu Umar. Utilization of a Non - Polar Agent against *Achea catacoloides* Caterpillar Induced Urticaria. Adv. Biores. Vol 4[4] December 2013: 70-73