ASEAN Journal of Science and Engineering

Journal homepage: http://ejournal.upi.edu/index.php/AJSE/

Paracord Anklet and Bracelet Controls Against Mosquitoes

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ABSTRACTS

The purpose of this study is to assess the effectiveness of paracord anklet and bracelet made up of guyabano (*Annona Muricata*) seeds and wormwood plant (*Artemisia Absinthium*) extract as mosquito repellent and to determine if the paracord anklet and bracelet can be as effective as the commercial patch used in this study. In the study, 2 groups were examined: The experimental group and the control group. The experimental group with variation 1 (50 guyabano seed, 80% of water, and wormwood extract), variation 2 (75 Guyabano seed, 50% of water, and wormwood extract), and variation 3 (100 Guyabano seed, 30% of water, and wormwood extract). The control group was tested with the commercialized patch. Results showed that the overall gathered data showed very promising effectiveness, with a level of effectiveness of 6.5 means. Furthermore, the ANOVA showed no differences at all between the Control and Experimental Group (fcalc 2.20<fcrit3.49, P=0.13). This may therefore mean that the paracord anklet and bracelet made up of guyabano and wormwood plant is as effective as the commercial patch used in this study. This study shows that the paracord anklet and bracelet can be considered as an alternative and environmentally friendly mosquito repellent.

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ARTICLE INFO

Article History:
Received 26 Jan 2021
Revised 08 Feb 2021
Accepted 11 Feb 2021
Available online 11 Feb 2021

Keyword:
Bracelet,
Guyabano,
Mosquitoes,
Repellent,
Wormwood

1. INTRODUCTION

Mosquitoes are the most disturbing blood-sucking insect afflicting human beings bringing them different diseases such as Dengue, Malaria, Chikungunya, and Yellow Fever. The first case of Dengue was first reported in the Southeast Asia, namely in the Philippines and Thailand (Reyes & Escaner, 2018). Control of mosquitoes is something of utmost importance in the present day with rising number of mosquito borne illnesses (Yimer & Sahu, 2014). The active substance in anti-mosquito products is corrosive so that it can cause skin irritation. The eco-friendly control of mosquito vectors is a crucial challenge of public health importance (Rodrigues *et al*., 2019). Many plants contain compounds, which are environmentally safe for use as alternatives in the control of mosquitoes (Rodrigues *et al*., 2019).

Several studies have been conducted regarding safe plants to protect against mosquitoes such as: Eucalyptus spp, (Batish *et al*., 2008), (Elsiddig, 2011), Citronella (Sakulku *et al*., 2009), Mentha spp. (Govindarajan *et al.*, 2012), L. javanica, (Kazembe & Samuel, 2012), Lavender (Jaenson *et al.,* 2006), and Lemon Eucalyptus (Jaenson *et al.,* 2006). Bracelets and angklets are a medium to repel mosquitoes (Karunamoorthi & Sabesan, 2009). However, there is no study combining the effectiveness of Guyabano (Annona Muricata) seeds and Worwmwood Plant (Artemisia Absinthium) extract and use that substance to make a Paracord Anklet and Bracelet.

The purpose of this study is to assess the effectiveness of Paracord Anklet and Bracelet made up of Guyabano (*Annona Muricata*) seeds and Wormwood Plant (*Artemisia Absinthium*) extract as mosquito repellent and to determine if the Paracord Anklet and Bracelet can be as effective as the Commercial Patches, and to control mosquitoes that are afflicting human beings and to lessen the use of synthetic insecticides which have negatively affected the environment. The study shows the effectiveness of plants substances as an alternative and environmentally friendly mosquito repellent.

2. METHODS

This study utilized Experimental Research Design. Experimental type of research is used to progress in giving the researchers an idea on how the design would exist. The researchers used Guyabano (*Annona Muricata*) seeds and Wormwood Plant (*Artemisia Absinthium*) extract to produce a mosquito repellent. There are 3 variations in the composition of research on bracelets and anklets using Guyabano seeds (*Annona Muricata*) and wormwood plant extracts (*Artemisia Absinthium*). Variation 1 with 50 Guyabano seed, 80% water, wormwood extract., Variation 2 with 75 Guyabano seed, 50% water, wormwood extract., And variation 3 with 100 Guyabano seed, 30% water, wormwood extract. **Figure 1**. describes the procedure for making bracelets and anklets using Guyabano seeds (*Annona Muricata*) and wormwood plant extracts (*Artemisia Absinthium*) to produce mosquito repellents.

The instrument used in determining the effectiveness of the Paracord Anklet and Bracelet as a Mosquito repellent was an improvised laboratory mosquito cage with a measurement of 18 by 18 inches, and the collected mosquito wrigglers were put in an open container inside the laboratory mosquito cage.

DOI: http://dx.doi.org/10. 17509/xxxxt.vxix
p- ISSN 2775-8419 e- ISSN 2775-8427

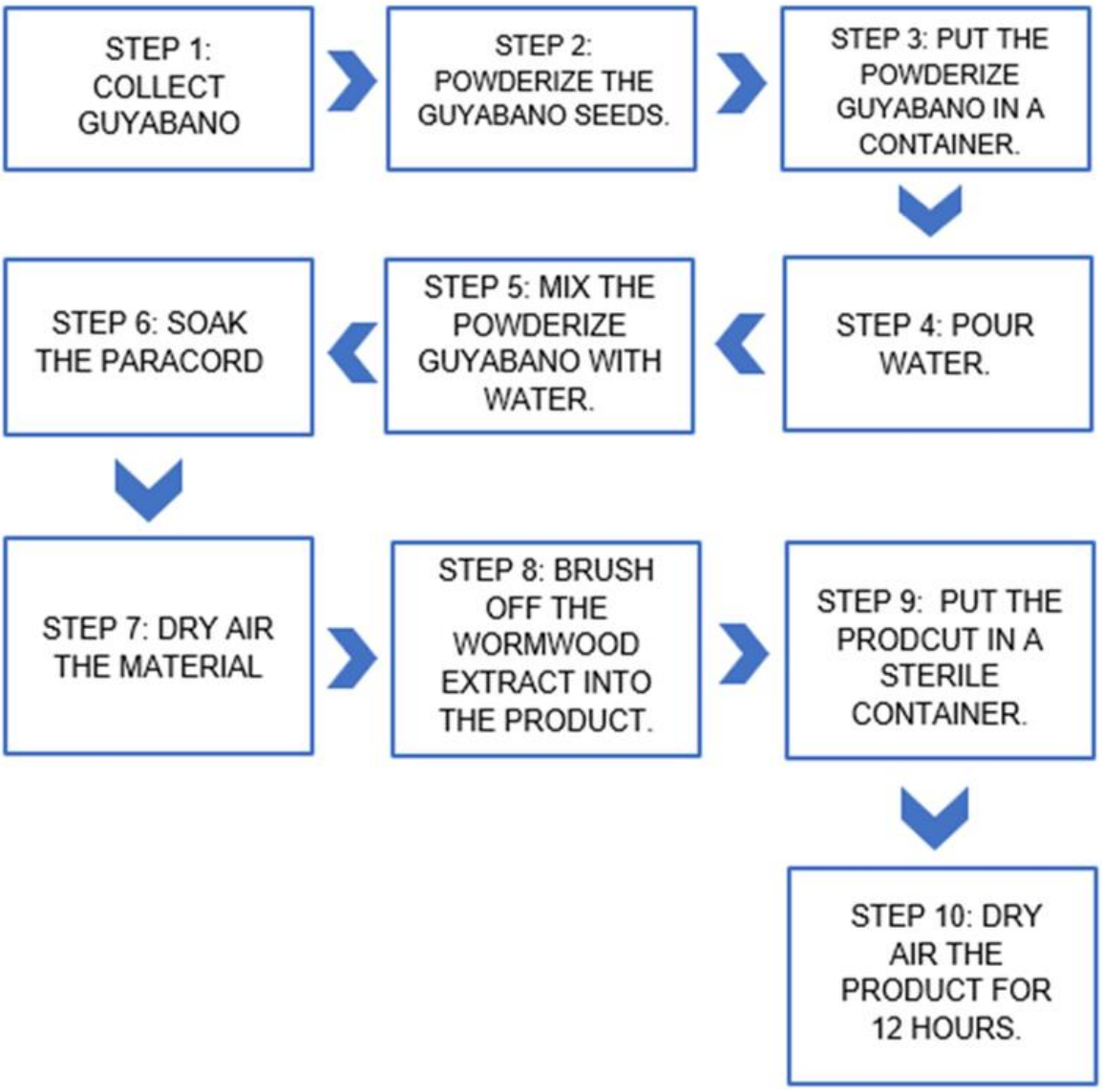

Figure 1. The procedure for making bracelets and anklets using Guyabano seeds (*Annona Muricata*) and wormwood plant extracts (*Artemisia Absinthium*).

3. RESULTS AND DISCUSSION

Table 1 shows the results of the Experimental Group. As illustrated, Treatment 1 showed an effective result with 6.0 mean control. Meanwhile, Treatment 2 displayed a very effective result with 6.3 mean control. Treatment 3 also presented a very effective result with the highest mean control of 6.6. The overall results of the gathered data showed very promising effectiveness. It shows that the Paracord Anklet and Bracelet has a level of effectiveness of 6.5 means. However, any protection provided is likely also localized, such as wearing bracelet is unlikely to protect the face or feet.

DOI: http://dx.doi.org/10.17509/xxxx.vxix
p- ISSN 2775-8419 e- ISSN 2775-8427

Table 1. The level of Effectiveness of Paracord Anklet and Bracelet made up of Guyabano (Annona Muricata) seeds and Wormwood Plant (*Artemisia Absinthium*) extract as mosquito repellent.

Treatments	R1	R2	R3	Mean	Descriptor
T1 (50 Guyabano seeds, 80 % Water, Wormwood Extract)	6	7	5	6.0	Effective
T2 (75 Guyabano seeds, 50% Water, Wormwood Extract)	7	6	6	6.3	Very Effective
T3 (100 Guyabano seeds,30 % Water, Wormwood Extract)	7	7	6	6.5	Very Effective
Overall Mean	6.6	6.6	6.3	6.5	Very Effective

Table 2 shows the results of the Control and Experimental Groups. As shown in table 2, R1 (50 Guyabano seeds, 80% water, wormwood extract) and R3 (100 Guyabano seeds, 30% water, wormwood extract) have the highest commercial patch value, namely 6.While R1 (50 Guyabano seeds, 80% water, wormwood extract) and R2 (75 Guyabano seed, 50% water, wormwood extract) with the highest experimental value, namely 6.6. of the three variations, the first variation or R1 has a high value. The content in Guyabano (*Annona Muricata*) seed has toxicity properties that are effective against insects (Hui *et al*., 1991), and has acetogenin which acts as an insecticide, acaricide, antiparasitic, and bactericidal (Alali *et al.*, 1999).

Table 2. Shows the results of the Control and Experimental Group.

Treatments	R1	R2	R3	Mean	Descriptor
Commercial Patch	6	5	6	5.6	Less Effective
Experimental	6.6	6.6	6.3	6.5	Very Effective
Overall Mean	6.3	5.8	6.1	6.0	Effective

Table 3 shows the Analysis of Variance (ANOVA) it shows whether there is a significant difference or not between Commercial Patch and Paracord Anklet and Bracelet with its level of significance at 0.05. Based on the ANOVA table, it showed no differences at all between the Control and Experimental Group (fcalc 2.20<fcrit3.49, P=0.13). ANOVA results imply that the null hypothesis cannot be rejected. This may therefore mean that the Paracord Anklet and Bracelet made up of Guyabano (*Annona Muricata*) and Wormwood Plant (*Artemisia Absinthium*) is as effective as the Commercial Patch used in this study.

Table 3. ANOVA of the study.

Source of Variation	SS	Df	MS	F	P-value	F crit
Between Groups	2.21	3	0.737	2.20	0.13	3.49
Within Groups	4.00	12	0.33			
Total	6.21	15				

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p- ISSN 2775-8419 e- ISSN 2775-8427

4. CONCLUSION

Based on the results of the study, The Paracord Anklet and Bracelet made up of Guyabano (*Annona Muricata*) seeds and Wormwood Plant (*Artemisia Absinthium*) extract showed the highest level of effectiveness as a mosquito repellent. It is also consequent to examining the results of the three trials, nevertheless, the ANOVA indicated no notable variance at all between the control group and experimental group.

5. ACKNOWLEDGEMENTS

Great thanks to the Almighty God for all the blessings and guidance to harness the professional competence and academic background of the researcher. The researchers convey their warm thanks and gratitude to Mr. Adonis Besa, Mrs. Amera Malaco, Mrs. Mari Peduca Sombria, Mrs. Anamarie Valdez, and Hassanal P. Abusama who generously shared their time for the completion of the study.

6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

7. REFERENCES

Alali, F. Q., Liu, X. X., and Mclaughlin, J. L. (1999). Annonaceous acetogenins: Recent progress. *Journal of Natural Products*, *62*(3), 504-540.

Batish, D. R., Singh, H. P., Kohli, R. K., and Kaur, S. (2008). Eucalyptus essential oil as a natural pesticide. *Forest Ecology and Management*, *256*(12), 2166-2174.

De Los Reyes, A. A., and Escaner IV, J. M. L. (2018). Dengue in the Philippines: Model and analysis of parameters affecting transmission. *Journal of Biological Dynamics*, *12*(1), 894-912.

Elsiddig, F. (2011). Effect of organic extracts of cafure leaves (eucalyptus camaldulensis dehn.) on mosquitoes (anopheles arabiensis patton.). *Gezira Journal of Agricultural Science*, *9*(2).

Govindarajan, M., and Benelli, G. (2016). Artemisia absinthium-borne compounds as novel larvicides: Effectiveness against six mosquito vectors and acute toxicity on non-target aquatic organisms. *Parasitology Research*, *115*(12), 4649-4661.

Govindarajan, M., Sivakumar, R., Rajeswari, M., and Yogalakshmi, K. (2012). Chemical composition and larvicidal activity of essential oil from mentha spicata (linn.) against three mosquito species. *Parasitology Research*, *110*(5), 2023-2032.

Hui, Y. H., Rupprecht, J. K., Anderson, J. E., Wood, K. V., and Mclaughlin, J. L. (1991). bullatalicinone, a new potent bioactive acetogenin, and squamocin from annona bullata (annonaceae). *Phytotherapy Research*, *5*(3), 124-129.

Jaenson, T. G., Garboui, S., and Pålsson, K. (2006). Repellency of oils of lemon eucalyptus, geranium, and lavender and the mosquito repellent mygga natural to ixodes ricinus

DOI: http://dx.doi.org/10.17509/xxxx.vxix
p- ISSN 2775-8419 e- ISSN 2775-8427

(acari: ixodidae) the laboratory and field. *Journal of Medical Entomology*, *43*(4), 731-736.

Kazembe, T., and Samuel, J. E. R. E. (2012). malaria control with mosquito repellent plants: colophospermum mopane, dicoma anomala and lippia javanica. *World Journal of Life Sciences and Medical Research*, *2*(4), 141.

Rodrigues, A. M., Silva, A. A. S., Pinto, C. C. C., Santos, D. L. D., Freitas, J. C. C. D., Martins, V. E. P., and Morais, S. M. D. (2019). Larvicidal and enzymatic inhibition effects of annona muricata seed extract and main constituent annonacin against aedes aegypti and aedes albopictus (Diptera: Culicidae). *Pharmaceuticals*, *12*(3), 112.

Sakulku, U., Nuchuchua, O., Uawongyart, N., Puttipipatkhachorn, S., Soottitantawat, A., and Ruktanonchai, U. (2009). Characterization and mosquito repellent activity of citronella oil nanoemulsion. *International Journal of Pharmaceutics*, *372*(1-2), 105-111.

Yimer, S., and Sahu, O. (2014). Anti-mosquito repellent from artemisia annua. *International Journal of Medical Sciencesi*, *1*(1), 1-8.

DOI: http://dx.doi.org/10. 17509/xxxxt.vxix
p- ISSN 2775-8419 e- ISSN 2775-8427