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The Impact of Soaking Time for Extracting Neem Leaves on the Pest of Local Chili Plants

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Abstract:
Neem is an exceptional plant from Indian region, perceived today as a characteristic plant which can be utilized in numerous fields, for example, agriculture and human health. Researchers are presently concentrating on the significance of neem in the horticultural field. This tree and its many dynamic functions are utilized to make various things. Common properties of neem don't have any poisonous responses. One of the neem wide uses is as characteristic pesticide which extracted from the leaves. The experiment was run to investigate the effectiveness of neem leaves extraction as a potential natural pesticides against pest such as crickets on the chili plants. The parameter conducted is soaking duration of neem leaves against the number of crickets left after the spray of neem leaves extraction is applied.

Keywords **—Neem leaves, natural pesticides, extraction, pest, spray.**

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I. INTRODUCTION

Pesticide is a very dangerous compound mostly used in agriculture to remove unwanted plant from growing out and spread across. [1] Pesticide can be defined as pesticide can be defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest such as insects, mites, nematodes, weeds, rats, and etcetera. By its nature, it's toxic to environment which contributed to soil pollutions [2][3][4][5][6] and water pollutions [7][8][9][10][11][12][13]. Due to these pollutions, currently researchers searching for an alternative way to replace pesticide from conventional method to natural pesticides. Moreover, natural pesticide research is still progressing and further research is needed in many aspects. Plant species produce secondary metabolites substances that protect them by repelling the insect pests. Natural pesticides have many benefits over chemical based pesticides. It is economically viable, biodegradable, no scums in the soil and very minimal harm to humans or animals. In addition natural pesticides are more accessible in both developing and developed countries [14].

Lately, neem has pulled in worldwide consideration because of its potential as a wellspring of normal medications and furthermore condition friendly type pesticides [15]. Neem is perceived today as a characteristic plant which has much to offer in comprehending worldwide farming, environmental and general medical issues. There has been studies going on related to neem plant such as on neem oil [16][17][18][19], neem leaves [20][21][22], neem seeds [23][24][25].

II. METHODOLOGY

Firstly, before the neem leaves were dried, the leaves were cleaned and soaked with distilled water to clean any kind of contaminants in the leaves. Secondly, the wet mass of the leaves were obtained by using analytical balance. Then, the wet leaves were dried to remove excess water before it was dried in the microwave by using kitchen towel or paper. After the leaves were dried, the leaves would

be dried by using microwave on 250°C. The leaves were left to dry for 3 minutes until it was brittle, crunchy and completely dried. The dry mass of the leaves were obtained by using analytical balance. After 3 minutes, the dried leaves were crushed into powder form by using mortar and pestel to increase the surface area. Then, the leaves would be soaked with distilled water for 3 days. This process was called as water extraction. After 3 days, the mixture would be strained by using sieve mesh filter and cheesecloth to remove the sludge.

III. RESULT AND DISCUSSION

This chapter will discuss about the findings based on the experiment which was conducted in the greenhouse. The experiment was carried out using chilli plants and crickets as pest. The extraction of neem leaves was used as natural pesticides.

A. Effect of soaking duration of Neem leaves extraction

In this experiment, the neem leaves were soaked from 3 and 7 days accordingly and then extracted as a natural neem pesticides. This to investigate the effect of days from the soaked neem leaves to expel pest (crickets). The extracted neem leaves were then used to spray to the chilli plant, acting as natural pesticide. The crickets were put on the chilli leaves in a contained environment to avoid the crickets from freely leaving the chili leaves. The chilli leaves were sprayed based on 2 and 4 spray a days with 3 and 7 days soaked neem leaves.

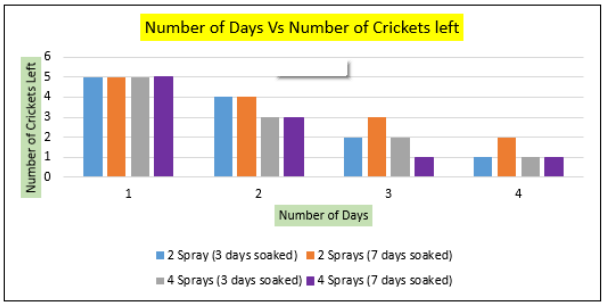

Fig. 1Number of days (soaked neem leaves) against number of crickets left

From the bar chart in Figure 1 above, the trend of number of crickets are decreased when the days are increased for both of 2 and 4 spray. The factor for number of sprays does not contribute much in the expelling the crickets away as the result shown the numbers is slightly different and having quite the same effectiveness. However the number of days for soaked neem leaves shown the differences for 3 days and 7 days soaking. The reason is due to the longer days of soaked neem leaves which providing more concentrated of the extraction. The concentration of the neem extraction provide more properties including repellence to pests [26].

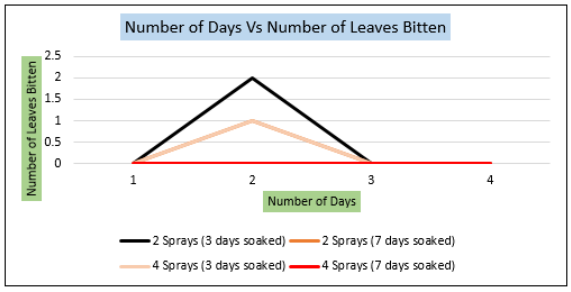

Fig. 2Number of days (soaked neem leaves) against number of leaves bitten

For the above Figure 2.0, this is related to how many leaves from the chili plant had been eaten by crickets once the extraction of neem leaves were sprayed to the leaves. From the obtained result, it shown that the bitten leaves reduced starting from day 2 onwards once the sprays were applied. However, for 4 sprays (7 days soaked) showed a very effective as the number of leaven bitten is none from day 1 until day 4. This shows the antifeedant activities of the produced neem pesticide even though the number of sprays are different. This happened because of the antifeedant properties contained in the produced neem pesticide. The antifeedant showed strong activities in neem extract is attributed to the presence of salannol, salannin, and 3-O-acetyl salannol [26].

B. Comparison of natural pesticide and conventional pesticide

In this experiment, two types of natural and conventional pesticides had been used to investigate the effectiveness of the natural neem pesticides compared to conventional pesticides.The conventional pesticide was labelled as X brand.

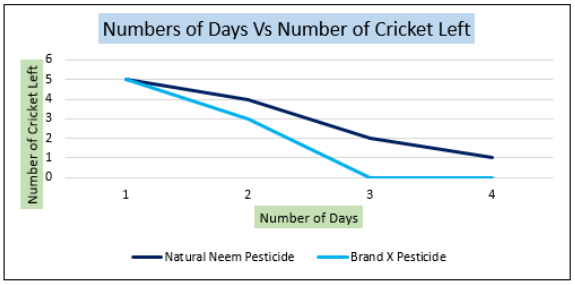

Fig. 3 Graph of number of days against number of crickets left

Based on graph shown in Figure 3, the number of crickets left depends on the type of pesticide used. Both neem pesticide and brand X pesticide (conventional pesticide) are applied on the chili plants in the same method. Moreover, 7 days of soaking (soaking of powdered neem leaves with distilled) and 4 times of sprays are chosen to makes a more effective neem pesticide due to the previous results. Based on the graph, brand X pesticide immediately killed all of the crickets left in the greenhouse in just 3 days. From the observation, brand X pesticide produced an unpleasant smell. This shows that the conventional pesticide can be quite harmful since most pesticides can be more effective by affecting the nervous system of insects. This means the conventional pesticide can affect insect's nervous system but in the same time it can contribute to the human health [27][28]. However due to safety and non-hazardous material, natural neem pesticide can be potentially used as a replacement for conventional pesticides as the result showed the decreasing of number of crickets around the chili plant.

IV. CONCLUSIONS

Based on the findings from the experiment which had been carried out, the soaking duration contributes a significant parameter in producing a better natural pesticide from the neem leaves. The 7 days soaking duration showed a very positive result compare to 3 days soaking duration for both 2 and 4 sprays. The spray parameter however does not shows a major effect in expelling the pest. The comparison of natural neem pesticide with brand X pesticide gives also shows that natural neem pesticide can be used as alternative method to replace conventional pesticides in order to reduce water and pollution, caused by the pesticides.

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