

Conference Paper

Effects of Cigarette Butts Extract on the Mortality of Mosquito Wrigglers

Conсорcia S. Tan¹ and Marcelina V. Pacho²

¹Laguna State Polytechnic University

²Ecosystems Research and Development Bureau

Abstract

The study aimed to determine the effects of cigarette butt extract on the mortality of mosquito wrigglers. It is an experimental research using true experimental design. Mosquito wrigglers collected were randomly selected with 10 wrigglers each treatment. The containers used for the treatment were randomly arranged following the complete randomized block design with 3 replicates each treatment. Five treatments were tested: T₁ Control₁ (Water); T₂ Control₂ (Extract from new filter); T₃ 1 used cig-butt/li sdw/period of exposure (pE) until death of wrigglers; T₄ 2 used cig-butt/li sdw/pE; T₅ 3 used cig-butt/li sdw/pE where 24 hours was the period of filter/cig-butt extraction or simple water soaking of cig-butt, and new filter for control. Mosquito wrigglers were collected using an empty aquarium. These treatments were unsuccessful. Modifications were made on the number of cig-butts, quantity of water, period of soaking/extraction of cig-butts and the period of exposure. When the cig-butts were soaked for 48 hours, mosquito wrigglers all died in T₄ and T₅ after 15 hours period of exposure. No wriggler died in T₃. Result of the experiment for the 4 trials revealed that the more cigarette butts extracted for a given quantity of water will kill mosquito wrigglers when exposed longer to the treatment.

Keywords: cigarette butt, extract, mortality, wrigglers

Corresponding Author:
 Conсорcia S. Tan
 consortan22@gmail.com

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1. Introduction

Cigarette butts or cig-butts are absolutely litter. They are almost everywhere that mother earth is becoming a huge ashtray! Litter statistics after the 2000 coastal clean-up day in California beaches collected 230,000 butts in just one day [1]. Accordingly, there are over 176, 000,000 pounds of discarded cig-butts in the United States each year. The U.S. estimated that over 4.5 trillion cig-butts are littered worldwide each year, and considered that most littered item on earth.

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The Philippines is one of the top ten countries whose population is engaged in smoking. An estimated 17 million Filipinos aged 15 and older smoke according to the 2009 Philippine Global Adult Tobacco Survey (GATS). Of this number, 3 million eight hundred thousand Filipinos smoke every day

It is not surprising therefore, that in the Philippines, cigarette butts are scattered, as smokers haphazardly tossed them almost everywhere. The cigarette wastes accumulate outside the building, on parking lots, port area/ surroundings and streets where

they can be transported through rain/ storm drains to canals, streams, rivers and beaches. Cig-butts can be seen also in clay pots with plants, inserted in holes of walls/ fences, soft drinks/ beers and any bottles and injected on tree trunk holes and in-between branches (personal observations).

Unmindful and careless smokers' worldwide toss/ flick/ throw litter their cig-butts whenever and wherever they want. This is an indicator that they do not know the consequences of their wrong doing. Maybe, a few know and realize that they (smokers) do not only stress and poison themselves but our environment as well. It is not just a matter of unsightly trash and litter but toxins from butts/ filters are then washed out into the soil/ grounds into waterways, and deep down the watersheds, river and oceans. Birds and sea mammals/ animals, wildlife included, and worst, even children ingest the cig-butts due to mistaken identity (thinking that butts are food). Cig-butts have been found in the stomach of fish, birds, whales and other marine creatures [2]

Other than health hazard, carelessly tossed cig-butt can start a fire that destroys forest, fruit/ plantation/ orchard, or homes and human/ animals. Fires caused by cig-butts claim the lives of about 1,000 people and injure about 3,000 people each year[3].

The cig-butts, due to mistaken identity are not only ingested by wildlife and marine animals but also by children. The US Center for Disease Control Studied 146 children aged 6 months to 2 years who had ingested cigarettes or cig-butts[4]. One third of them experienced illness the most common symptom reported was vomiting. Most ingestion occurs in homes where children were exposed to smoke and where cigarettes and ashtrays were kept within the reach of children.

Impacts of cig-butt littering on the environment also include possible causes of wildfire, additional cost/ resources for environmental clean-up activities and death of small and microscopic animals in the soil and water that are part and parcel of food chain. To verify the latter environmental adverse effect, mosquito wrigglers were subjected to cigarette butt extract. Hence, this study was pursued.

2. Objectives of the Study

The study aims to determine the effects of cigarette butt extract on the mortality of mosquito wigglers.

Specifically, it sought to determine the most lethal dose/proportion of cig-butt/quantity of sterilized distilled water/period of exposure of mosquito wigglers. It also would like to assess if there is any difference on the effects of the different proportions of cig-butt/quantity of sterilized distilled water/period of exposure on the mortality of mosquito wigglers.

3. Materials and Methods

3.1. Research design

The study is an experimental research utilizing the complete randomized block design where the effect of the independent variable on the dependent variable is determined under strictly controlled condition. Effects of different treatments are tested in comparison with a control variable.

3.2. Materials

An aquarium was utilized for the rearing of mosquito wigglers. Cigarette butts were collected and soaked in distilled water using plastic containers.

3.3. Data collection procedure

Mosquito wigglers collected are randomly selected with 10 wigglers each treatment. The containers used for the treatment were randomly arranged following the complete randomized block design with 3 replicates each treatment.

1. The treatments used for the first trial were:

T₁ Control₁ Water

T₂ Control₂ Extract from new filter

T₃ 1 used cig-butt/li sdw/period of exposure (pE) until death of wigglers

T₄ 2 used cig-butt/li sdw/pE

T₅ 3 used cig-butt/li sdw/pE

Where

24 hours was the period of filter/cig-butt extraction or simple water soaking of cig-butt, and new filter for control

10 wigglers per treatment were used for the test

3 trials/replications were conducted for the experiment

Initial experiments using these treatments were unsuccessful. Modifications were made on the number of cig-butts, quantity of water, period of soaking/extraction of cig-butts and the period of exposure.

Trial 2

T₁ Control₁ Water

T₂ Control₂ Extract from new filter

T₃ 5 used cig-butt/li sdw/pE until death of wigglers

T₄ 10 used cig-butt/li sdw/pE

T₅ 15 used cig-butt/li sdw/pE

Where

24 hours was the period of filter/cig-butt extraction or simple water soaking of cig-butt, and new filter for control

10 wigglers per treatment were used for the test

3 trials/replications were conducted for the experiment

Trial 3

T₁ Control₁ Water

T₂ Control₂ Extract from new filter

T₃ 5 used cig-butt/100 ml sdw/pE until death of wigglers

T₄ 10 used cig-butt/100 ml sdw/pE

T₅ 15 used cig-butt/100 ml sdw/pE

Where

24 hours was the period of filter/cig-butt extraction or simple water soaking of cig-butt, and new filter for control

10 wigglers per treatment were used for the test

3 trials/replications were conducted for the experiment

Trial 4

T₁ Control₁ Water

T₂ Control₂ Extract from new filter

T₃ 5 used cig-butt/100 ml sdw/pE until death of wigglers

T₄ 10 used cig-butt/100 ml sdw/pE

T₅ 15 used cig-butt/100 ml sdw/pE

Where

48 hours was the period of filter/cig-butt extraction or simple water soaking of cig-butt, and new filter for control

10 wigglers per treatment were used for the test

3 trials/replications were conducted for the experiment

The mortality rate of mosquito wigglers per treatment was calculated on percentage basis. The number of dead wigglers was divided by the total number of tested insects multiplied by 100.

4. Results and Discussion

Initial experiment using the treatments in the proposal were tried out.

Results of the experiment revealed that extracts of cigarette butts in all treatments did not have any effect on the death of mosquito wigglers even after several hours and days of exposure.

The number of cig-butts per liter of water was increased to 5, 10 and 15 respectively for T₃, T₄ and T₅ for the same quantity of water and period of exposure. However, no effects were also observed on the mortality of wigglers.

To make the solution more concentrated, the sdw was reduced to 100 ml for the same number of cig-butts. Still, no effects were observed.

However, when the cig-butts were soaked for 48 hours, mosquito wigglers all died in T₄ and T₅ after 15 hours period of exposure.

5. Conclusion and Recommendation

Result of the experiment for the 4 trials revealed that the more cigarette butts extracted for a given quantity of water will kill mosquito wigglers when exposed longer to the treatment. Use more concentrated extracts of cigarette butts and allow longer period of exposure. Use glass jars instead of plastic bottles.

Author's Note

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