

## **BIOLOGICAL ASSAY OF INDIGENOUS PISCICIDAL PLANTS IN ILOCOS SUR**

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### **Introduction**

Plants, animals and microorganism are sources of natural products, which are results of primary metabolism. Such products are secondary metabolites. These substances are essential to living organisms and were found to have significant importance to man's life. These substances range from toxic to highly poisonous substances as well as edible ones for household use.

In natural products, bioactive substances were found and isolated from plants. They were extracted from the leaves, flowers, fruits, roots and even the bark. It is the main purpose of this study to conduct preliminary tests to determine the toxicity of the leaf extracts of seven (7) indigenous plants species against *Tilapia nilotica*. Such plants were chosen based on the ethnobotanic information derived from the locality.

### **Objectives**

1. To conduct preliminary bioassay of seven indigenous plant species against *Tilapia nilotica*.
2. To determine their toxicity for future product formulation.

### **Materials**

Seven indigenous plants were collected from Vigan, Ilocos Sur and nearby municipalities. The plants are kakawate (*Gliricidia sepium*) leaves,

Paper presented at the Northern Luzon Aquatic Resources Research and Development, Second Areas Commodity R & D Review Sept. 29-Oct 2, 1997, UNP, Vigan, Ilocos Sur

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bayating (*Anamirta coccolus*) fruits, sineuelas aso (*Casearia grewiaefolia*) fruits, bagbagotot (*Phyllanthus reticulatus*) fruits, atis (*Anona aquamosa*) leaves, balballosa fruits and kanumay fruits.

Twenty grams of samples were chopped and macerated and dissolved in 50 ml of distilled water. The crude extract was allowed to stand overnight. Ten tilapia of 2 months old were placed in a plastic pail containing 5 liters of pond water.

The toxicity of the plant species was tested on tilapia fishes. The concentration of the crude extract was set at 20 grams/50ml (0.4g/mL). The concentrated crude extract was dissolved in 5 mL of pond water. Each plant specie is replicated into 5 pails containing 10 tilapia and a control.

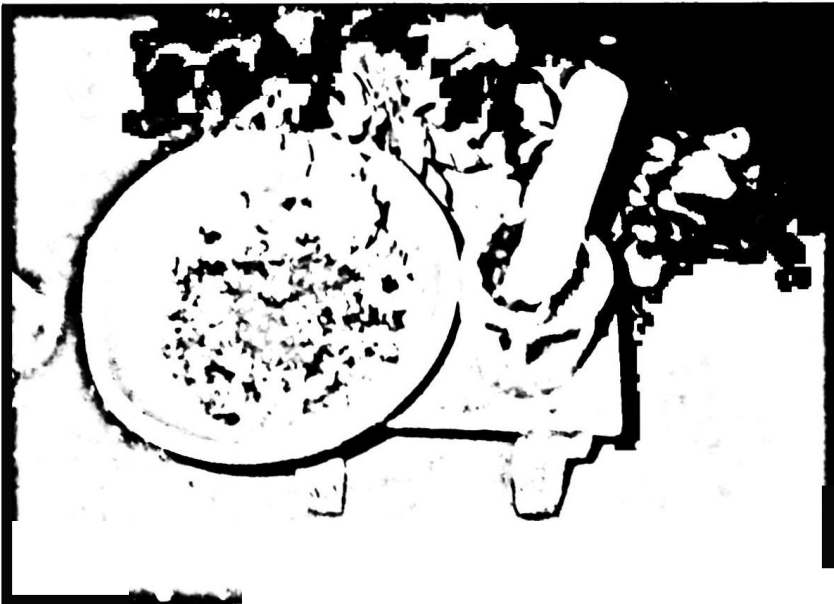
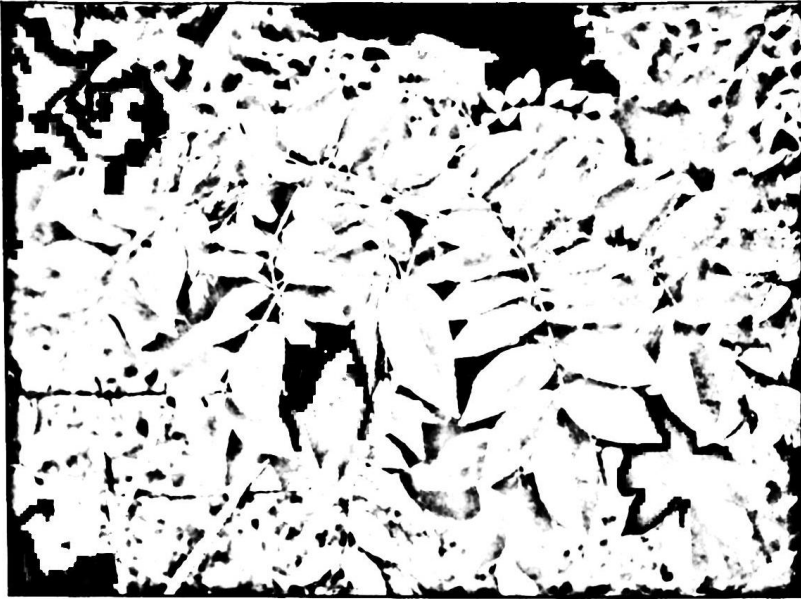


Figure I. The preparation of the crude extract from leaves. The leaves are chopped, macerated and squeezed.



**Kakawate (*Gliricidia sepium*) Jacq. Kunth ex Walph**

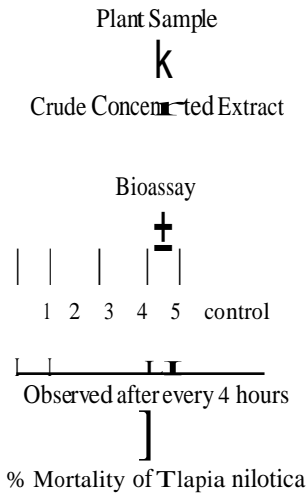


**Siniguelas Aso (*Casearia grewiaefolia*) Vent.**



Atis (*Annona squamosa*)

Methodology

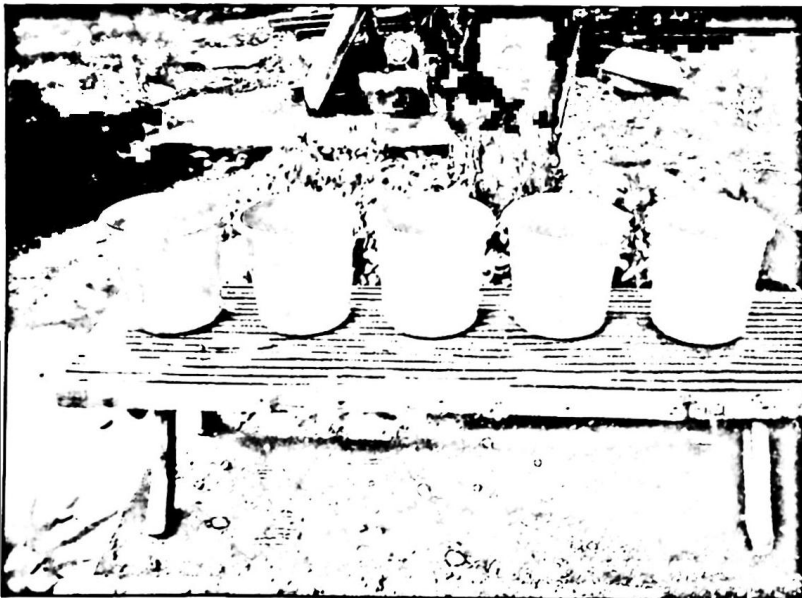


Scheme 1. The preparation of the concentrated crude extract and the bioassay of plant sample against *Tilapia nilotica*.

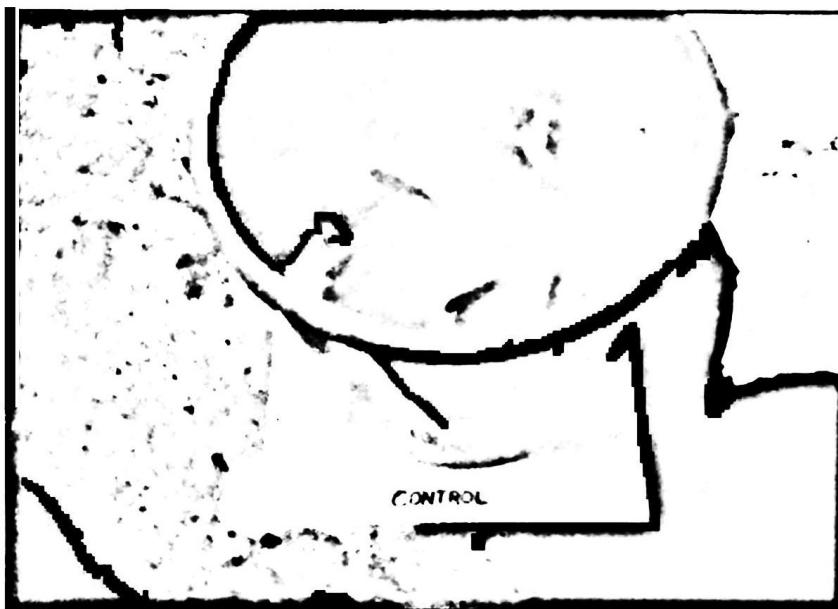
## Results

Species	After 4 hrs.	After 12 hrs.	Control
kakawate	0	2	0
bayating	10	-	-
siniguelas aso	0	8	0
balballosa	0	6	0
kanumay	2	8	0
bagbagotot	0	0	0
atis	0	3	0

The number of mortality using seven indigenous plant species against *Tilapia nilotica* after placing 10 grams/5L of concentrated crude extract.



The biological assay of the plant sample was done 5 replicates.  
Each replicate contains 10 *Tilapia nilotica* test organisms.



The biological assay includes a control. All IO test Tilapia survived after seven (7) experimental days.

## Discussion

Among seven indigenous plant species, six out of seven manifested bioactivity after 12 hours of observation, bagbagotot did not manifest toxicity. Atis and kakawate were slightly toxic on tilapia. Balballosa and siniguelas also are toxic against tilapia. Kanumay manifested high toxicity after 4 hours of observation. Two deaths were counted and four more were counted after 12 hours. Of all the 7, bayating indicated the most toxicity. It showed 100% toxicity right after 4 hours.

## Conclusions

It is concluded that bayating (*Anamirta coccolus*) is highly toxic to tilapia (*Tilapia nilotica*), Kanumay, siniguelas also, balballosa, atis and kakawate are slightly toxic at 0.4g/mL crude concentration after 4 hours and 12 hours of observations.

**References:**

Harborne, J. B. 1996. Phytochemistry. International Journal of Plant Biochemistry & Molecular Biology. Pergamon Press.

Rabena, A. 1996. The Isolation, Characterization and Identification of the Active Components of Kakawate (*Gliricida sepium*) Jacq. Kunth ex. walph. Against Termites. UPLB/Universiti Putra Malaysia, Ph.D. Dissertation.

Rabena, A & E. Cachola, 1997. The Isolation and Antimicrobial Assay of Coumarins from Kakawate (*Gliricidia sepium*) Jacque. Kunth ex. Walph. Paper presented at the 33<sup>rd</sup> Annual BIOTA Convention, CLSU, Munoz, Nueva Ecija.

Yamashina, I. 1997. Journal of Biochemistry, Molecular Biology and Biophysics. Hardwood Academic Publishers