| | | | | |
|---|---|---|---|---|
| November | 55 | 37 | 18 | 1:0.49 |
| December | 60 | 22 | 38 | 1:1.73 |
| January | 46 | 31 | 15 | 1:0.48 |
| Total | 237 | 132 | 105 | 1:0.80 |

**Table 3:** Linear Regression for Predicting Weight of *Chrysichthy., nigrodigitatus* and *Chrysichthy, wakeri* using Standard Length

| Specie | Dependent variable | Prediction Equation (Y=a+bx) | n | r | r² | SE | Sign. |
|---|---|---|---|---|---|---|---|
| *Chrysichthys nigrodigitatus* | Relative Fecundity, Y | 2.52+119a | 32 | 0413 | 0.171 | 9.44 | * |
| | RelativeFecundity,Y | 17.15+004b | 32 | 0.349 | 0.122 | 971 | * |
| *Chrysichthys wa/keri* | Relative Fecundity, Y | 1420+062a | 105 | 0.126 | 0.16 | 1217 | ns |
| | Relative Fecundity, Y | 21.06+003b | 105 | 0141 | 0.020 | 1214 | ns |

*P < 005 **P < 001 ns -not significant

a -Standard Length b -Body Weight

# INCIDENCE OF MAYFLY *(POVILLA SP.)* INFESTATION OF WOODEN INFRASTRUCTURES OF ARTISANAL FISHERS IN THE LAGOON AND MARINE " FISHERIES LOCATIONS OF OGUN STATE, NIGERIA.

*BY*

B. B. Adekoya[1] and K.B. Olurin[2]
[1]Ogun State Agricultural Development Programme
P. M. B. 2122, Abeokuta, Nigeria
[2]Olabisi Onabanjo University, Ago-Iwoye, Nigeria

Abstract
A diagnostic survey of the incidence of Mayfly *(Povilla* sp.) infestation of wooden infrastructures of the artisanal fishers in ten (10) lagoon and marine fishing villages of Ogun States was carried out through the application of a structured questionnaire and participatory Rural Appraisal interviews. The demographic, infrastructural and socio-economic characteristics of the ten fishing villages sampled were derived and analyzed. The infestation which occurs all year round is found to be most prevalent (70% ) in the wet season, increasing proportionally with salinity from 56% (Brackish water); to 63% (marine).

The life-span of infested wooden crafts which is reduced from between 55% to 62% (Freshwater); 41 % (Brackish water); and 38% (Marine),Annual financial loss of NI0,000.00 per fisher or N80,000,000.00 to the 8000 strong artisanal fishers affected in Ogun State is involved.

It is recommended that fishers should preferably use non-wood crafts and infrastructures while adopting appropriate management strategies for containing the existing infestation.

## Introduction

The Mayfly, *Povilla sp.* is of worldwide occurrence with over 1500 species known. It belongs to the order Ephemeroptera. The adult which is about 2.5cm long, is found commonly along the margins of rivers, lagoons, reservoirs, natural lakes, canals, channels brackish water, creeks, creeklets and the marine water front. (Bullough, 1970). It is transparent, glassy and fragile with atrophied mouthparts (Vines and Rees, 1972), .with very long cerci and a median caudal filament. It is found in the waters of all the four fisheries biotopes of Ogun State, Nigeria (Fig 1) It has long antennae with extremely reduced hind wings. (Fig.2).

The life cycle of the adult often begins with its emergence at the advent of the rains in May, hence the term "Mayfly:" (Coche, 1979). It does not feed with its atrophied (underdeveloped) mouthparts apart from taking in fresh air for survival (SE.C., 1984). It lives for only 24 hours during which it lays its eggs along the water front margins. These eggs float for a while and undergo some metamorphosis which affect their specific gravities causing them to sink to the water basins. Here, they undergo further development under favourable conditions, hatching into the' nymphs called *naiads.* ( S.E.C. 1984; Adekoya, 2001).

The nymphs which are very destructive have a four year life span during which they feed on wooden infrastructure such as: boats, canoes paddles; poles, jetty columns, beams, and floating jetty platforms. The nymph applies its strong mounthparts to wood causing a network of perforations, occasioning the considerable wasting and weaking of many wooden fisheries infrastructures which eventually collapse (Adekoya, 2001). The nymphs have natural biological enemies in fishes such as: *Synodontis sp.. Hepsetus odoe;* and *Channa obscura* in addition to birds, bats, toads and frogs. These natural enemies of Mayfly nymphs are almost all relished as food by man. (SEC, 1984). The nymphs are thus, able to conveniently have a four year unhindered tenure of destruction during which they acquire biomass for their next stage of development (Adekoya, 2001).

The subimago develops from the nymph after four years of its destructive activities in water. It leaves the water, flies around for a few days, moults and gives rise to the Adult or Imago. (S.E.C. 1984; Adekoya, 2001). The adult emerges to live for 24 hours, lay its eggs and die to continue the life cycle. (Bullough, 1970).

## Methodology

A structured questionnaire was applied in a survey of ten artisanal fishing villages in Ogun State (Fig. 1) Two of these villages were marine, four were of the coastal lagoon, while the other four were of the freshwater lagoon locations. The questionnaire was used to derive the demographic, infrastructural and socio-economic characteristics of each of the fishing villages and fishers. The results were analyzed and used to make appropriate inferences and recommendations which have possibilities for assuring the cost effective management of the mayfly infestation.

## Results

From the results of this study, the infestation of wooden infrastructures of artisanal fishers by Mayfly *(povilla sp)* nymph occurs in the freshwater, brackishwater and marine environments. This infestation is found through all the seasons of the year with the most prevalent (70% ) occurring in the wet season synchronous with the time the nymphs emerge *en masse* in May at the advent of the rains (Coche, 1979).

The results of this study also show that there is a proportional increase in the Mayfly *(Povilla sp)* nymph infestation of artisanal fishers' wooden infrastructure with increasing salinity from freshwater lagoon (56%) to marine (63%). This thus, suggest, that the rate of Mayfly *(Povilla sp.)* nymph.infestation is directly proportional to the increasing rate of salinity of the aquatic environment. (Fig.3) .

It was also found from the results of this study (Fig.3) that the rate of decline of wooden infrastructures (life span) is inversely proportional to the rate of mayfly *(Povilla sp)* nymph infestation within the three sample environments of freshwater (45% ) through brackishwater (41% ) to marine (38% ).

The results of this study reveal that most artisanal fishers (70%) manage their Mayfly *(Povilla sp)* nymph infested wooden crafts through sun-drying, others use shade-drying (20% ) while a few engage in water soaking of crafts (10%).

The average financial loss per fisher in Ogun State from the result of this study is N10,000.00 annually, implying a loss of at least N80,000,000.00 to the 8,000 strong fishers involved (Adekoya et al, 2000)

The fishers affected by Mayfly *(Povilla sp.)* nymph infestation salvage their wooden infrastructure by using: tar-painting; metal braiding/stripping; Rubber stripping; and aluminum sheet patching. (Plate 1). More often than not, the infested wooden crafts collapse as the network of perforations (Plate 2) surcharge the life span of the crafts by some 55% -62%.

**Table 1: Demographic and infrastructural characteristics of sampled fishing villages**

| Fishing Village | Approximate Size(km2) | Resident Population | Fishers' Population | Wooden Crafts No | Infested Wooden Crafts(No) |
|---|---|---|---|---|---|
| 1. Abigi+ | 0.9 | 5000 | 1000 | 40 | 22 |
| 2. Agamaden* | 0.2 | 300 | 250 | 50 | 26 |
| 3. Akere* | 0.5 | 600 | 200 | 80 | 45 |
| 4. Awodikora+ | 0.4 | 650 | 200 | 80 | 36 |
| 5. Igbeki | 0.5 | 450 | 250 | 100 | 68 |
| 6.Igbosere | 0.6 | 2500 | 1500 | 500 | 288 |
| 7. Iwopin+ | 1.2 | 3000 | 600 | 150 | 89 |
| 8. Izigi* | 0.3 | 800 | 500 | 150 | 91 |
| 9. Ode-omi+ | 0.6 | 1500 | 500 | 100 | 52 |
| 10 Wheke* | 0.3 | 250 | 75 | 25 | 14 |

**Source: Field Survey (2001)**
**+ Freshwater lagoon fishing villages**
*** Brackish water fishing villages**
**0 Marine fishing villages**

**Table 2: Socio-economic characteristics of sampled fishing villages**

| Fishing Villages | Average Annual Per fisher(₦) | Average Unit canoe Cost (₦) | Life span of normal Canoe(Yrs) | Life span of Mayfly infested canoe(Yrs) | Average annual cost of infestation |
|---|---|---|---|---|---|
| 1.Abigi+ | 50000.00 | 15000.00 | 8 | 4 | 1500.00 |
| 2. Agamaden* | 75000.00 | 20000.00 | 10 | 4 | 2000.00 |
| 3. Akere* | 85000.00. | 20000.00 | 10 | 4 | 2000.00 |
| 4. Awodikora+ | 55000.00 | 15000.00 | 8 | 4 | 1500.00 |
| 5. Igbeki0 | 150000.00 | 50000.00 | 8 | 3 | 3500.00 |
| 6. Igbosere0 | 180000.00 | 50000.00 | 10 | 3 | 3500.00 |
| 7. Iwopin+ | 50000.00 | 15000.00 | 10 | 4 | 1500.00 |
| 8. Izigi* | 80000.00 | 20000.00 | 8 | 4 | 2000.00 |
| 9. Ode-omi+ | 65000.00 | 15000.00 | 9 | 3 | 1500.00 |
| 10 Wheke* | 45000.00 | 20000.00 | | 4 | 2000.00 |

**Source: Field Survey (2001)**
**+ Freshwater lagoon fishing villages**
*** Brackish water fishing villages**
**0 Marine fishing villages**

## Discussion

From the results of this study, the following are recommended: That artisanal fishers should use non-wood fishing crafts and infrastructures to curtail the effects of Mayfly *{Povilla sp.)* nymph infestation.

That fishers involved with the use of wooden fishing crafts and infrastructures should employ the use of chemically-treated

wood in construction to reduce Mayfly *{Povilla sp.)* nymph infestation effects to the barest minimum.

That steel and ferroconcrete structures should be preferably used for the construction of jetties, wharves and jetty-poles in order to considerably reduce the effects of Mayfly *{Povilla sp.)* infestation.

That fishers should generally desist from the practice of water- soaking of fishing crafts in order to control the infestation activities of Mayfly *{Povilla sp.)* nymph in water.

That more research work should be done to provide appropriate biological control methods for arresting the present level of Mayfly *{Povilla sp.)* nymph infestation of wooden infrastructures in many fishing villages.

## *Conclusion*

Whereas, the annual financial loss to Mayfly *{Povilla sp.)* infestation of the wooden crafts and infrastructures of artisanal fishers is colossal, they are best advised to adopt appropriate management strategies available for controlling the pest which constitutes a menace to their livelihood.

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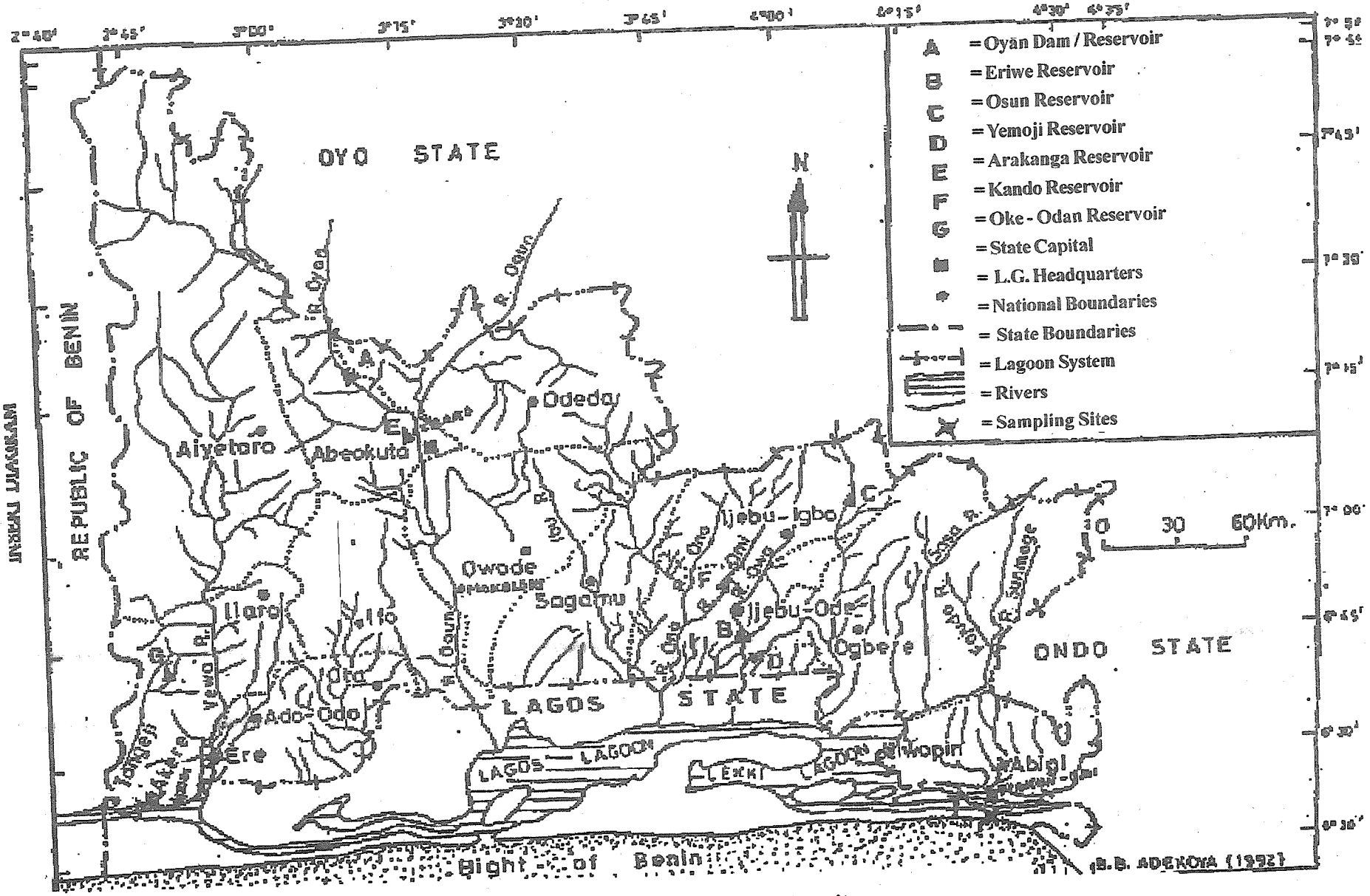


Fig. Ogun State showing sampling sites

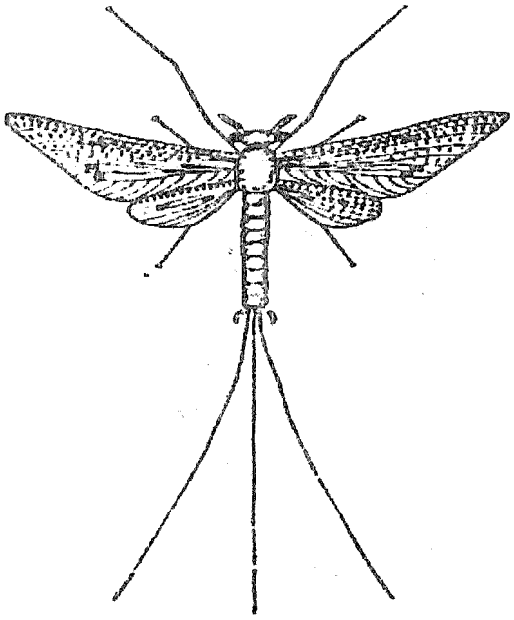

Fig. 2: The Adult Mayfly (Povilla sp.)

A = Mayfly infestation levels
B = Wooden craft decline levels (life span)

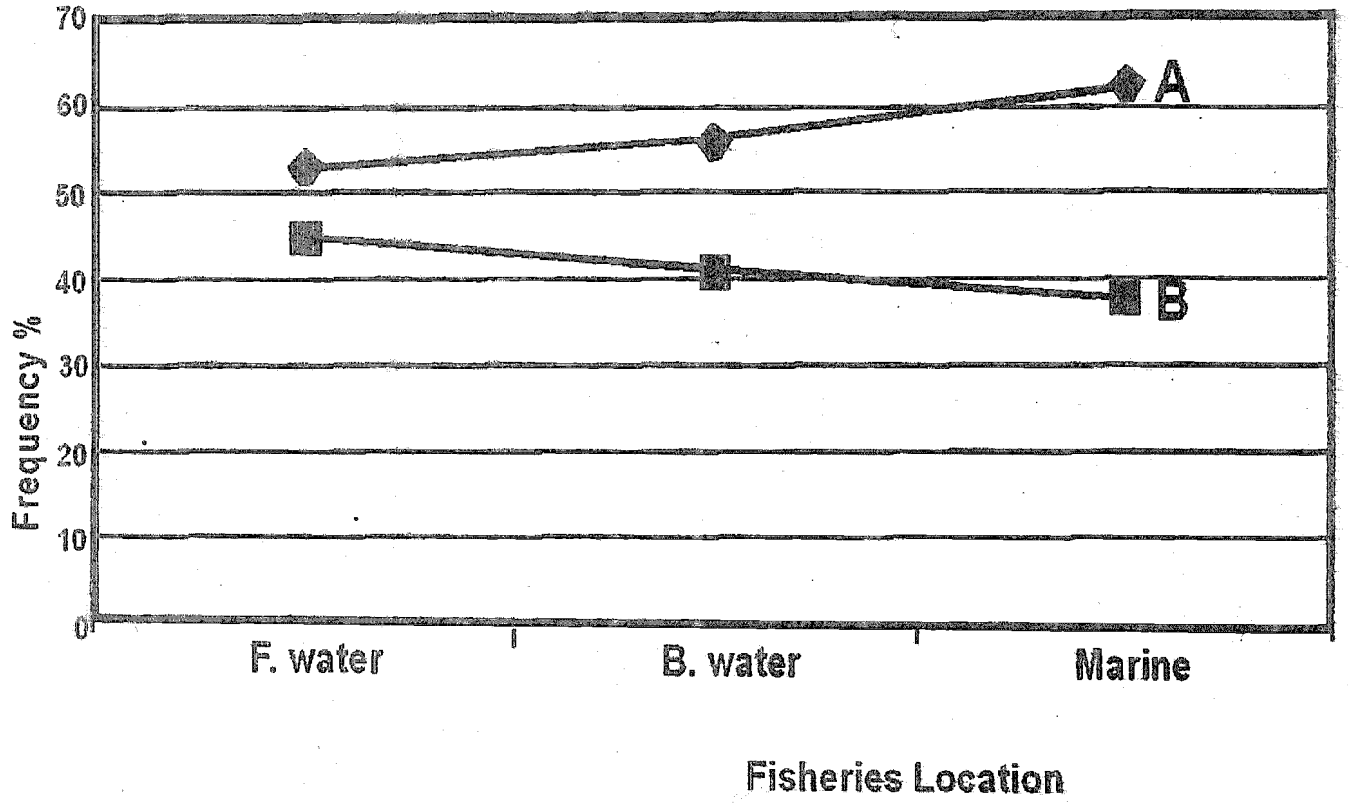


Fig. 3: Pictorial Analysis of Mayfly infestation characteristics across freshwater, brackishwater and marine fisheries locations

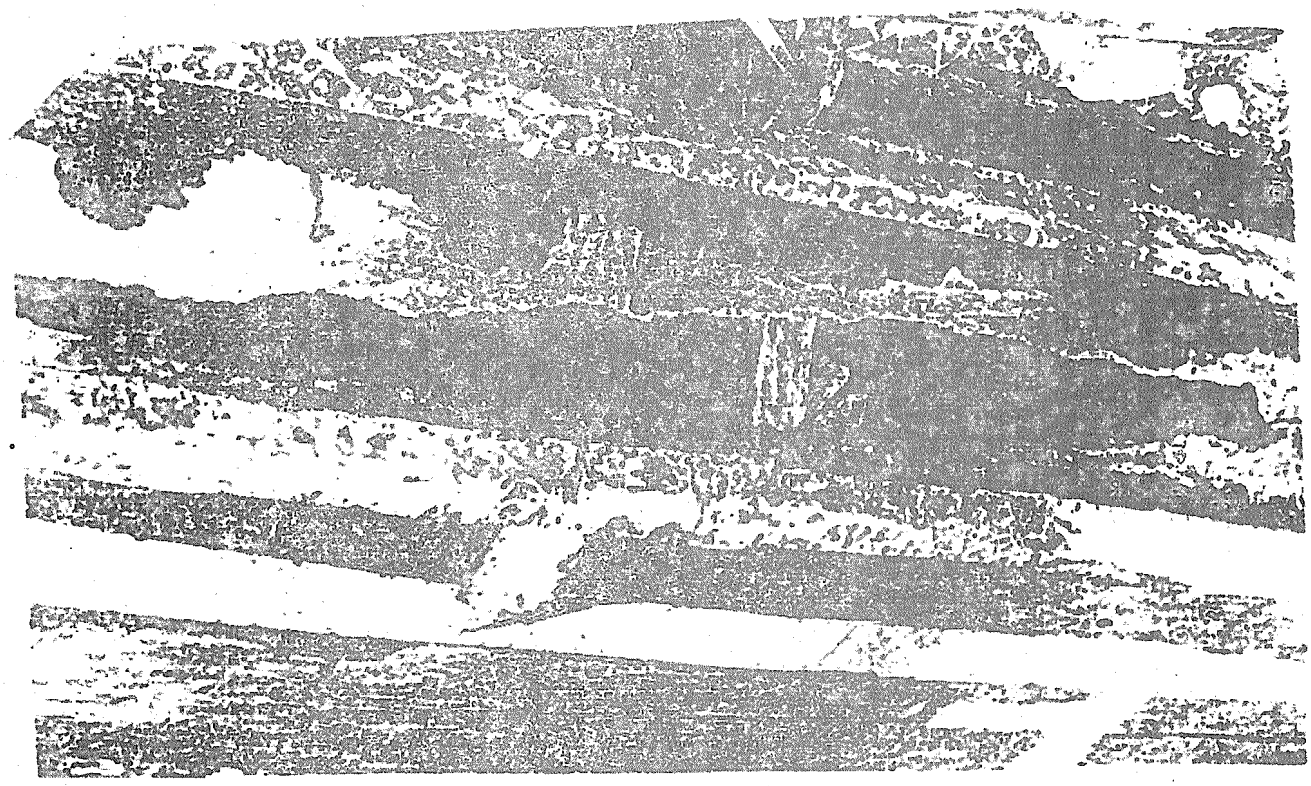

**Plate 1:** Washed wooden canoe with Mayfly (Povilla sp.) nymph infestation

**Plate 2:** Network of perforated wooden craft materials after Mayfly (Povilla sp.) infestation