Contents

Abbreviations i
List of Table ii
List of Figures iii-xiv
List of Appendices xv-xvi

Chapter I
Introduction 1-15
Objectives 16

Chapter II
Review of literature 17-36

Chapter III
Methodology
A. Procurement and maintenance of fish 37-38
B. Procurement of pesticides 38-40
C. Acute toxicity tests 42
D. Sublethal or chronic toxicity tests
   1. Measurement of growth 43
E. Estimation of acetylcholinesterase (AChE) activity 44-45
F. Morphological changes
   1. Estimation of caudal bending 45
   2. Sample preparation for radiological studies 45-46
   3. Sample preparation for SEM 46
G. Recording of behavioural changes in pesticide exposed Channa punctatus Bloch.
   1. Recording of opercular movements 46
   2. Recording of surfacing 47
   3. Documentation of behavioural changes using Tracker 4.81 47-49
   4. Fractal analysis 49
Chapter IV  
Results

A. Acute toxic effects on survival  51-60
B. Sublethal toxic effects on growth  61-69
C. Sublethal effects on acetylcholinesterase activity  70-83
D. Sublethal effects on morphology
   I. Caudal bending  84-97
   II. Changes in gill morphology as
        Revealed by SEM
           1. Acute effects  98-101
           2. Chronic toxicity study  102-113
E. Sublethal effects on behaviour
   I. Opercular movement  114-122
   II. Surfacing  123-127
   III. Video analysis of movement of
        the pesticide exposed fish using
        Tracker 4.81.
        128-186
   IV. Determination of path tortuosity
        of the fishes by fractal dimension
        using Image J  187-203

Chapter V
Discussion  205-228
Summary and conclusion  229-233
References  234-265
Appendix  266-271