



MUSLIM ARTS COLLEGE

(Affiliated to Manonjaya College)
 Thiruvithancode - 629174
 Tamil Nadu, India.



National Seminar
 On

**RECENT TRENDS IN AQUATIC AND
 TERRESTRIAL BIOLOGY**

22nd April - 2022

Organized by

P.G and Research Department of Zoology

CERTIFICATE

This is to certify that Prof. / Dr. / Mr. / Ms. /
 M. Thiruvath... Fatima... Quraishi, Asst. Professor, Dept. of Zoology
 has participated / delivered an invited Lecture / presented a
 paper entitled *Studies on the effect of natural antioxidants
 on the pesticides accumulated mulberry leaves and silkworm Bombyx
 mori L.*
 in the National Seminar on Recent Trends in Aquatic and
 Terrestrial Biology held on 22nd April 2022, organized by the
 P.G and Research Department of Zoology, Muslim Arts College,
 Thiruvithancode, Kanyakumari - 629174, Tamil Nadu, India.

Dr. T. Kumaran
 Organizing Secretary

Dr. M. Romani Bai
 Head of the Department

Dr. G. Edwin Sheela
 Principal

Dr. Lion H. Mohamed Ali
 Secretary / Correspondent

PROCEEDINGS OF NATIONAL SEMINAR ON

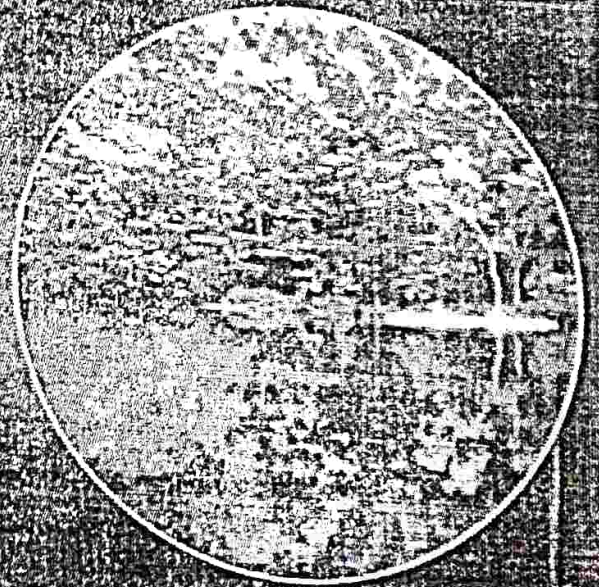
RECENT TRENDS IN AQUATIC AND TERRESTRIAL BIOLOGY

Edited by

Dr. T. Kumaran

Dr. C. Christo Queensly

Dr. M. Thilsath Fathima Quraiza



22nd April, 2022

Organised By



PG & RESEARCH
DEPARTMENT OF ZOOLOGY
MUSHIM ARTS COLLEGE
Thiruvithancode, Pin - 629174

Copyright © 2022 by Raj Pathippakam

All rights reserved.

Reproduction or translation of any part of this book by any means without prior permission from the publisher is unlawful. Requests for permission or further information should be addressed to the copyrighter.

The author of the book is fully responsible for the facts and figures presented in this book.

Further it is stated that the publisher is not responsible for the statements or opinions expressed by the author of the book.

ISBN : 978-93-84737-33-7



ISBN 978-93-84737-33-7

Published by

Raj Pathippakam,
3E, North Street,
Kurusady,
Nagercoil - 4

28.	A STUDY ON SOURCES AND EFFECTS OF PHARMACEUTICAL POLLUTION S. NIRMALI AND T. KUMARAN	89
29.	STUDIES ON THE EFFECT OF NATURAL ANTIOXIDANT IN THE PESTICIDES ACCUMULATED MULBERRY LEAVES AND SILKWORM, <i>BOMBYX MORI</i> L. G. CHITHRA AND DR. M. THILSATH FATIMA QURATZA	91
30.	EFFICACY OF MEDICINAL PLANT EXTRACTS ON PROTEIN ANALYSIS IN SILKWORM, <i>BOMBYX MORI</i> L. JAISY PRABHA, J.P. JESPA AND DR. M. THILSATH FATIMA QURATZA	94
31.	AN ANALYSIS OF EDIBLE FROG SPECIES IN NORTH EAST INDIA (NAGALAND) J. VINCY VILLA AND VIVOVINU VISA	96
32.	PREVENTIVE EFFECT OF EGG YOLK IMMUNOGLOBULIN (IGY) ON <i>AEROMONAS HYDROPHILA</i> INFECTION IN A FRESHWATER FISH G. SINDHU KUMARI AND T. KUMARAN	100
33.	ANTIOXIDANT AND PROXIMATE ANALYSIS IN CARROT AND RIDGE GOURD PEEL POWDER MRS. K. ROSY, DR. T. RENISHEYA JOY JEBE MALAR, AND MS. S. RAJA LAKSHMI	104
34.	STUDIES ON THE GROWTH AND ECONOMIC PARAMETERS OF SILKWORM <i>BOMBYX MORI</i> L. FED WITH RIBOFLAVIN TREATED MULBERRY LEAVES D. MELBA AND C. CHRISTO QUEENSLY	107
35.	CYCLODEXTRINS IN SUPRAMOLECULAR COMPLEXES - A REVIEW R. PERIASAMY	110
36.	BIOLOGICAL INFLUENCE OF PHTHALATE ON HUMAN HEALTH M. RUDR JENITA.	114
37.	EFFECT OF DIETARY SUPPLEMENTATION OF SEAWEED (<i>ULVA LACTUCA</i>) ON GROWTH, SURVIVAL AND TOTAL SKIN CAROTENOID OF KOI CARP, <i>CYPRINUS CARPIO</i> . R.L. DIHANYA MOL, DR. M. PRABU AND N. RAJESWARI	117
38.	EFFECT OF HERBAL EXTRACT AGAINST MICROBIAL PATHOGENS CAUSING DISEASES IN THE MULBERRY SILKWORM <i>BOMBYX MORI</i> L. T. CHRISTOPHER RANJITH SINGH, DR. G. HEPZIBAH BEAULAH, AND DR. I. JANSI RANI	121
39.	HEMOCYTE TYPES IN A FRESHWATER CRAB, <i>PARATELPHUSA</i> SP. T. JUDHANA, G., AND SHYLA SUGANTHI, A.	126
40.	MICROBIAL ANALYSIS ON ICE CREAM ENRICHED WITH EGG WHITE AND FOX NUTS (<i>NELUMBINIS SEMEN</i>) MRS. C. BATHYALAKSHMI, MRS. A. MARITHANGAM, DR. T. RENISHEYA JOY JEBE MALAR AND MS. P. ROSHINI	129
41.	A COMPREHENSIVE EXAMINATION OF DRUG DESIGN SOFTWARE AND APPLICATIONS NINHA RALS, SEKARAN, S., S. SARITHA SADANANDAN PILLAI, BANU S. HUSSAIN, MOHAMMED YASIR, B. V. VIBALA, ANOOJ E.S., SWARNA BHARATHILD	132

STUDIES ON THE EFFECT OF NATURAL ANTIOXIDANT ON THE PESTICIDES ACCUMULATED MULBERRY LEAVES AND SILKWORM, *BOMBYX MORI* L.

Recent Trends in Aquatic and Terrestrial Biology

G.S.Chithra¹ and Dr.M. Thilash Fatima Quratza*

¹Ph.Dscholar, Reg.No.19123092192007, Department of Zoology, Muslim Arts College, Thiruvithancode, Affiliated to Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli.
*Assistant professor in Zoology, Muslim Arts College, Thiruvithancode, Affiliated to Manonmaniam Sundaranar University, Abishekapatti Tirunelveli.

Abstract

Mulberry is the sole food for the silkworm (*Bombyx mori* L.). The healthy growth of the silkworm and economic traits are mainly influenced by the nutritional status of mulberry leaves fed to silkworm. Irrigation of water with pesticides leads to the depletion of nutrients in mulberry and cause toxicity to silkworm. Application of natural antioxidant rich water to mulberry crop not only increase the nutritional quality of mulberry leaves in turn influence the mulberry leaves growth and its economic traits of *B.mori*. Application of natural antioxidant significantly stimulated plant growth and improve cocoon parameters of *B.mori*.
Keywords: *Bombyx mori*, Natural antioxidant, Pesticides and Economic traits.

Introduction

Pests are a serious threat to agricultural crops. Nearly 1/3 of world's food production is affected by pests. Application of pesticides to food crops, commercial crops, fodder crops and silkworm crops leave a lot of problems to consumers. Pesticides sprayed leaves of mulberry plant on consumption pose a serious threat to *B.mori* larvae. Even a very dilute dose of some of the pesticides if applied and if their residues reside on leaves (Kunbayasi, 1988) it affect the physiological process in the silkworm. A number had traced the effects of pesticides on other silkworm eri, tassar and muga.

Nutritional efficiency was reported to vary in silkworm fed with pesticides treated leaves (Mahadeva and Shree 2006), residual effect of silkworm was reported (Bhosale et al., 1987). As the pesticides influenced on the nearby fields, gardens and mulberry plants may influence the biological economical characteristics of silkworms, when they feed on pesticides affected leaves an attempt has been made to find out their impact, when natural antioxidant applied over mulberry leaves and it improve economic parameters of silkworm.

Materials and methods

Field experiment were carried out after first pruning of mulberry crop during 2018-2020. This study was carried out the impact of irrigation with pesticides for growth and it in turn to economic parameters of *B.mori*. The source of irrigation water in the pond was analysed for P^H, Turbidity, EC, TDS, TSS, Chloride, Ca, magnesium and Nitrate.

Experimental design: In this V₁ mulberry raised in the experimental field. After 6 months old mulberry plants were irrigated with pesticides mixed water. It was considered as station II. Control mulberry plant considered as station I. After 6 months the experimental plants were treated with natural antioxidant treatment. Rice water is the natural antioxidant, which was used as treatment of experimental mulberry plant (Two times per day). One set of experiment, treated and control leaves were collected for leave analysis. Another set of leaves are used for silkworm rearing. The cocoons were harvested on the fourth day after spinning and the cocoon economic parameters were recorded in control, experiment and treated groups (Sonwalker, 1993) The experimental data recorded was subjected to statistical analysis by Zar (1984).

Result and discussion

Station I was considered as the control. Table 1 shows the water contain turbidity (8.167), pH(6.9), EC(80.15), TDS(10.1), TSS(9.4), Chloride (18.20), Ca(0.184), mg(0.54), DO(4.71), nitrate (0.114). Water quality index in control area was good (36.66). Table 2 shows that the water containing pesticide and it was considered as experimental water. The turbidity was decreased in pesticide mixed water sample is (10.17) when compared to control (8.167). P^H(6.9), EC(204.83)TDS(259.56), chloride(49.58), Ca(0.85)mg(1.315), DO(3.98), COD(70.91), nitrate (0.23). The water quality index in pesticides area was poor(90.67) when compared to control

Growth rate of tender, middle, and mature leaves of mulberry are given in table 3. The length and width of tender leaves are significantly increased (19.69 and 10.42) when compared to control (-16.72 and -20.85). The positive result was recorded in the length (15.06) and width (20.61) of mature leaves. This report was supported by Roy et al.(2010), who suggested that the rice bran oil as a natural antioxidant for mulberry.

Table 1: Water Quality Analysis in station I

Parameter	Standard value	Observed value	Wn	Qn	Wn log Qn
Turbidity	5	8.167	0.048	163.34	0.106
pH	6.5-8.5	6.9	0.03	2	0.009
EC	300	80.15	0.00081	26.72	0.0011
TDS	500	105.12	0.00048	21.04	0.00064
TSS	500	94.04	0.00048	18.81	0.00061
Chloride	250	18.20	0.00096	7.28	0.00082
Ca	100	0.184	0.0024	0.184	0.0018
Mg	30	0.54	0.008	1.8	0.0020
DO	4 to 6	4.71	0.04	115	0.082
COD	<4	1.85	0.06	48	0.101
Sulphate	250	0.513	0.00096	0.21	-0.00065
Nitrate	0.30	0.114	0.8	38	1.26

$\sum Wn \log Qn = 1.564$ $WQI = 36.66$

Table 2 : Water Quality Analysis in station II

Parameters	Standard value	Observed value	Wn	Qn	Wn log Qn
Turbidity	5	19.17	0.048	383.4	0.1240
pH	6.5-8.5	6.9	0.03	20	0.039
EC	300	204.83	0.0008	68.27	0.0015
TDS	500	259.58	0.00048	51.91	0.00082
TSS	500	308.17	0.00048	61.63	0.00086
Chloride	250	49.58	0.00096	19.83	0.0012
Ca	100	0.85	0.0024	0.85	-0.00016
Mg	30	1.315	0.008	4.38	0.0025
DO	4 to 6	3.98	0.04	123.48	0.084
COD	<4	70.91	0.06	1772.75	0.194
Sulphate	250	1.398	0.00096	0.559	-0.00024
Nitrate	0.30	0.23	0.8	76.66	1.509

$\sum Wn \log Qn = 1.957$ $WQI = 90.67$

Table 3 : Effect of antioxidant on the growth parameters of mulberry leaves

	Tender (cm)		Middle (cm)		Mature (cm)	
	Length	Width	Length	Width	Length	Width
Control	5.38±0.192	3.28±0.207	8.38±0.130	4.66±0.207	9.42±0.248	5.14±0.646
Pesticides	4.48±0.192 (-16.722)	2.5±0.192 (-20.85)	7.26±0.288 (-13.36)	4.32±0.363 (-7.07)	7.88±0.432 (-16.33)	4.18±0.376 (-18.67)
Treated	6.44±0.207 (19.69)	3.6±0.23 (10.42)	9.62±0.342 (14.79)	5.18±0.258 (11.15)	10.84±0.623 (15.06)	6.2±0.418 (20.61)

Table 4 : Effect of antioxidant on the economic parameters of silkworm *B.mori*

	Cocoon Weight (mg)	Pupal Weight (mg)	Shell Weight (mg)	Shell Ratio (%)
Control	1650±1.581	1340±1.783	310±16.4	18.78±0.12
Rice	1680±1.581 (1.81)	1334±1.581 (17.11)	350±1.581 (12.58)	20.83±1.07 (10.82)

Conclusion

This study indicate that the mulberry leaves when applied with pesticides free natural antioxidant improve the quantity of silk as revealed from enhancement of cocoon shell. According to the overall results of this investigation the natural antioxidant is highly recommended for rearing silkworms because of its beneficial effects on silkworm biological and economic productivity.

References:

- ❖ Gangopadhyay (2009), "Sericulture Industry in India - A Review", *Indiascience and Technology*.
- ❖ KerenhappW.(2007), "Biochemical and bioassay studies on the influence of different organic manures on the growth of Mulberry Variety V1 and silkworm, *Bombyx mori* Linn.", *Caspian J. Env. Sci.*, 5(1): 51-56.
- ❖ Roy, L. G, Delouge , S A & UroojA (2008), ' Antioxidant efficacy of mulberry (*Morus indica* L.) leaves extract and powder in edible oil', *International Journal of Food Properties*, Vol.13 pp.1-10.
- ❖ Mahesh, D. (2014), "Effect of different organic manures on growth and yield of mulberry and cocoon productivity".M.Sc Thesis, UAS, GKVK, Bengaluru, pp.1-100.
- ❖ Ram Rao, D.M., Kodundurmalaji (2007), "Effect of VAM fungi and bacterial bio fertilizers on mulberry leaf quality and silkworm cocoon characters under semiarid conditions". *Caspian J. Env. Sci.* Vol. 5 No.2 pp. 111-117.
- ❖ Ramakrishna (2011), "Investigation On The Sources Of Organics For Mulberry And Its Impact On Quantitative Traits Of The Silkworm, (*Bombyx Mori*L.)".I.J.S.N., Vol. 2(1): 114-117.
- ❖ Sakthivel,N.(2014) "Organic farming in mulberry, Technical bulletin Regional sericultural research station 'Tamil Nadu ,India".
- ❖ Sonwalker T.N.(1993), 'Hand book of silk technology', Taylor & Francis.