



**A.V.V.M. SRI PUSHPAM COLLEGE
(AUTONOMOUS),
POONDI – 613503, THANJAVUR – DT.
STAFF PROFILE as on : 31.01. 2022**



1. Name of the Staff : **Dr. K.KUMAR**
 2. Designation : ASSISTANT PROFESSOR
 3. Academic Qualification : M.Sc., M.Phil, Ph.D.,

Course	UG	PG	M.PHIL.	PH.D.
Year	2000 - 2003	2004-2006	2007-2008	2017
College & University	Rajah's Serfoji Govt, College, Bharathidasan University	A.V.V.M Sri Pushpam College, Poondi Bharathidasan University	A.V.V.M Sri Pushpam College, Poondi Bharathidasan University	A.V.V.M Sri Pushpam College, Poondi Bharathidasan University

4. Date of Birth & Age : 08-04-1982 – 39

5. Date of Appointment	Self – Finance	D	D	M	M	Y	Y	Y	Y
	FIP	0	8	0	7	2	0	1	0
	Aided	0	2	1	2	2	0	1	9

6. Total Service : 12 Yrs

7. Teaching Experience in completed years : UG 12 PG 12 M.Phil. 2

8. Residential Address : 5/37, A.Y.A. Nadar road, North Rohini Colony, North Gate(Po), Thanjavur – 613 008

Mobile Number : +91-9894373606

E-Mail Address : drsrikk@gmail.com

9. No. of Orientation / Refresher Courses and Training Programmes attended : 3

10. Whether FDP availed, if yes, furnish details : Nil

11. No. of Seminars attended : 14

12. No. of Papers Presented : 6

13. No. of Papers Published : 10

14. No. of Books Published : Nil

15. No. of Guest Lectures delivered in other institutions : Nil

16. No. of Research Projects undertaken : Minor Nil Major Nil Others (Specify) Nil

17. No. of Seminars organised : Nil

18. No. of. M.Phil. Scholars Guided : Completed -- Ongoing 01

19. No. of. Ph.D. Scholars Guided : Awarded Nil Ongoing Nil

20. Participation in Academic Research Bodies in other institutions : Nil

21. Service rendered in academic / Extra Curricular/ Extension activities within the College other than teaching : 2

22. Service rendered in Professional bodies outside the College : Nil

23. Honors / Awards received : 2

Note: Evidence should be produced at the time of verification of the Profile.

Signature of the Staff

ANNEXURE – I**DETAILS OF ORIENTATION, REFRESHER COURSES AND TRAINING PROGRAMMES ATTENDED:**

SL. NO.	COURSE	UNIVERSITY	PERIOD	TITLE
1.	Orientation Programme	IQAC A V V M sripushpam college. poondi	06.04.2015 to 18.04.2015	Special orientation programme for professors
2	Four week International Faculty Development Online Certificate Course	Department of Microbiology, Sacred Heart College (Autonomous), Tirupattur, Tamil Nadu, India in association with Microbiologists Society, India and Laboratory of Chemical and Biological Analysis (LAQB), Western Rio Janeiro State University (UEZO), Rio de Janeiro, Brazil	01 to 30, June 2020	MEDICAL BACTERIOLOGY
3.	FDP- Webinar Series III for Faculty	Centre for Research & Publication, Holy Cross College (Autonomous), Tiruchirappalli 620002, Tamilnadu, India	13 to 18 july 2020	UGC stride component – I capacity building of young Talent in Transdisciplinary Research of Sustainable Development of Society

SEMINARS/CONFERENCES, SYMPOSIA, WORKSHOPS, ETC ATTENDED

Sl. No	Name of the Seminars, Conferences, Symposia, Workshop,etc	Name of the sponsoring agency	Place	Date
1.	“Bioinformatics and genome Analysis”	UGC sponsored National Workshop	Centre for Bioinformatics, department of Zoology, at Nesamony Memorial Christian college, Marthandam	August 11-12, 2014
2	National level conference	Sponsored by Dept. of Science and Technology, UGC-Delhi, Tamil Nadu state council for science and Technology, Chennai, Flora people of biology	Dept. of Botany and Zoology, Chikkaiah Naicker college, Erode	March 9-10, 2012.
3.	The Science Academies Lecture Workshop on “Modern Trends in Zoology and Agriculture Microbiology ”	Indian Academy of Sciences, Bangalore, Indian National Science Academy, New Delhi And The National Academy of Sciences, Allahabad	Dept. of Zoology, Saiva Bhanu Kshatriya college, Aruppukottai	Feb. 7-8, 2017
4.	Seminar on modern approaches in zoology	Department of zoology	A V V M sripushpam college Poondi.	20.09.2013
5.	National Conference on Intellectual property Rights in Biodiversity and Biotechnology	DST – FIST	A.V.V.M. Sri Pushpam College Poondi	15& 16 Sep.2015
6.	National conference on Trends in Healthcare and Biotechnology : Opportunities & challenges	SERB	A.V.V.M. Sri Pushpam College Poondi	22&23 Jan.2016

7.	Seminar on Recent trends in Life Sciences.	Zoology Department	A.V.V.M. Sri Pushpam College Poondi	22 nd August 2016
8.	National conference on Healthcare and Biotechnology in India : Emerging Trends & challenges	UGC	A.V.V.M. Sri Pushpam College Poondi	17 & 18 August 2017
9.	Workshop on “Introductory course on surgical models of Ageing disorders- special emphasis on Brain and Heart”	DST-PUSE	Department of Biochemistry, Bharathidasan University	20.12.2021

ANNEXURE – IV

PAPERS PRESENTED IN SEMINARS/CONFERENCES, SYMPOSIA, WORKSHOPS, ETC

Sl. No	Title of the Paper	Level (State / National / International	Sponsoring Agency and Name of the Institution	Date
1.	“Studies on the 16s rRNA in the protease producing <i>Bacillus</i> in Earthworm (<i>Lampito marutii</i>) from the sewage water”	National level conference	Dept. of Science and Technology, UGC-Delhi, Tamil Nadu state council for science and Technology, Chennai, Flora people of biology.	March 9-10, 2012
2.	Supplementary effect of <i>Spirulina</i> on biochemical profile of Haemolymph in Silkworm <i>Bombyx mori</i> (L.)”,	National Conference on Intellectual Property Rights in Biodiversity	NABARD, National Biodiversity Authority India	15-16 Sep. 2015.
3.	Studies on the growth performance, biochemical estimation and antimicrobial activity of Silkworm <i>Bombyx mori</i> (L.) feed with <i>Spirulina platensis</i>	National Conference on Intellectual Property Rights in Biodiversity	NABARD, National Biodiversity Authority India	15-16 Sep. 2015.
4.	Study on the bioactive compounds and anti-pneumococcal activity of <i>Eichhornia crassipes</i> against <i>Klebsiella</i>	National Conference on Intellectual	NABARD, National Biodiversity Authority India	15-16 Sep. 2015.

	<i>pneumonia</i>	Property Rights in Biodiversity		
5.	Synthesis of Silk-Sericin Capped(SSP) nanoparticles and evaluation of their antimicrobial activity by using <i>Spirulina platensis</i> on Silkworm <i>Bombyx mori</i> (L.)”,	National Conference on Trends in “HealthCare and Biotechnology: Opportunities and Challenges (THBOC-2016	Sponsored by Dept. of Science and Technology, Govt. of India	Jan. 22-23 . 2016
6.	Comparative study of electricity generation in sugarcane and fish wastes using laboratory designed microbial fuel cell	National Conference on Trends in “HealthCare and Biotechnology in India: Emerging Trends and Challenges (HBIETC-2017	Sponsored by UGC, Govt. of India	August 17-18 . 2017
7.	Influence of <i>Spirulina platensis</i> supplementation With Mulberry Leaf on Reproductive Potentiality of Female Moth (<i>Bombyxmori</i> . L)	National conference On Wetland biodiversity and its conservation staergy	NBA sponsored, Organized by PG and Research Dept. of Zoology and Biotechnology, A.V.V.M. Sri Pushpam College (Autonomous), Poondi, Thanjavur,	January, 30-31. 2020
8.	Promotion of Livelihood & Entrepreneurship opportunity through Medicinal and Aromatic Plants,	National	NABARD Sponsored National Conference Department of Botany, Vivekanandha College of Arts and Science for Women, Thiruchengode	18 th & 19 th Feb 2020

RESEARCH PAPERS PUBLISHED:

Sl. No.	Title of the Paper	JOURNAL			Page Number
		Name	Volume	Year / Month of Publication	
1.	Studies on the impact of <i>Spirulina platensis</i> on the mulberry silkworm <i>Bombyx mori</i>	<i>Int. J. Res. Phytochem.pharmacol</i> ISSN: 2231-010X	3 (2)	2013	99-102
2.	Studies on the Nutritional supplementation of <i>Spirulina</i> treated MR2 mulberry leaves fed by V th instar larvae of Silkworm <i>Bombyx mori</i> (L), in relation to feed efficacy and growth rate	<i>Int.Journal of research in Zoology</i>	4 (2)	2014	13-18
3.	Supplementary effect of <i>Spirulina</i> on lipids and enzymes in Silk gland of Silkworm <i>Bombyx mori</i> (L.),	<i>Journal of Entomology and Zoology studies</i>	2(4)	2014	279-282
4.	Effect of <i>Spirulina</i> supplementation on nutritional indices parameters in Silkworm <i>Bombyx mori</i> (L.),	<i>world journal of Science and Research,</i>	1(2):	2015	41-48
5.	Seasonal variation of serum enzymes of Indian freshwater Eel <i>Aquila bicolor</i> (Mc Cleland),	<i>International Journal of Fisheries and Aquatic studies;</i>	3 (2)	2015	50-54
6.	Length- Weight relationship, Haematocrit and Haematological parameters of Indian freshwater Eel <i>Aquila bicolor</i> (Mc Cleland)	<i>International Journal of Fisheries and Aquaculture,</i>	5(3)	2015	128-139

7.	Microbial population and activity on vermicompost of <i>Eudrilus eugeniae</i> and <i>Eisenai fetida</i> in different concentrations of tea waste with cow dung and kitchen waste mixture	<i>Int. J.Curr.Microbiol. App.Sci</i> ;	4 (10) :	2015	496-507
8.	Analysis of Micro and Macro nutrients on vermicomposting of <i>Eudrilus eugeniae</i> and <i>Eisenai fetida</i> by using industrial tea waste with cow dung and kitchen waste mixture.	<i>World journal of Science and Research</i> . ISSN: 2455-2208.	1 (2)	2016	50-62
9.	Growth performance and hatchling rate of <i>Eudrilus eugeniae</i> and <i>Eisenai fetida</i> by using industrial tea waste with cow dung and kitchen waste mixture.	<i>Asian Journal of International Research</i> . ISSN: 2455-7285	1 (1) :	2016	46-52
10.	Synthesis of Silk Sericin Capped (Ssp) Silver Nanoparticles And Evaluation Of Their Antimicrobial Activity	The International journal of analytical and experimental modal analysis.	Volume 12 (5).	2020	1312-1322
11.	Impact of different concentration of spirulina supplemented diet on the biochemical profile of haemolymph of silk <i>Bombyx mori</i> L..	International journal of Entomology Research.	Volume 5 (5).	2020	126-128

ANNEXURE – XV

HONORS AND AWARDS RECEIVED

- Received BEST essay writing award (Second place) on Tamil Nadu Forest Department, Thanjavur. (30.09.2001).
- Participated in the Annual wild Life Census program of Pointcalimere Wildlife Sanctuary, Thanjavur.



To Learn & To Serve
Sri Pushpam Institute For Compassion



A.V.V.M. SRI PUSHPAM COLLEGE (AUTONOMOUS),

POONDI, THANJAVUR DT., TAMIL NADU.

Special Orientation Programme for Professors

06.04.2015 - 18.04.2015

Certificate

This is to certify that

Dr./ Prof. K. KUMAR

Assistant professor of zoology

has participated in the Special Orientation Programme for Professors

organized by the Internal Quality Assurance Cell [IQAC],

A.V.V.M. Sri Pushpam College (Autonomous), Poondi, Thanjavur Dt,

Tamil Nadu *from 06.04.2015 to 18.04.2015.*


Organizing Secretary
IQAC Co ordinator


Convenor
Principal


Patron
Secretary & Correspondent



**DEPARTMENT OF MICROBIOLOGY
SACRED HEART COLLEGE (AUTONOMOUS),
TIRUPATTUR - 635 601, TAMIL NADU, INDIA**

In association with

MICROBIOLOGISTS SOCIETY, INDIA

&

WESTERN RIO JANEIRO STATE UNIVERSITY (UEZO), BRAZIL

CERTIFICATE OF COMPLETION

is awarded to

Dr. K. KUMAR

*Assistant Professor, Department of Zoology, A.V.V.M Sri Pushpam
College (Autonomous), Poondi, Thanjavur, Tamil Nadu, India*

for participating in the Four week International Faculty Development
Online Certificate Course on **"MEDICAL BACTERIOLOGY"** organized
by the Department of Microbiology, Sacred Heart College
(Autonomous), Tirupattur, Tamil Nadu, India in association with
Microbiologists Society, India and Laboratory of Chemical and
Biological Analysis (LAQB), Western Rio Janeiro State University
(UEZO), Rio de Janeiro, Brazil from 1st - 30th June 2020 and has
successfully completed with **DISTINCTION**.

Dr. P. Saranraj

*Head, Dept. of Microbiology,
Sacred Heart College (Autonomous)
Tirupattur, India*

Dr. A. M. Deshmukh

*President
Microbiologists Society,
India*

Dr. Alexander Machado Cardoso

*Pro-Rector of Research & Post Graduate,
Laboratory of Environmental Biotechnology,
Western Rio Janeiro State University, Brazil*

Rev. Dr. D. Maria Antony Raj

*Principal
Sacred Heart College (Autonomous)
Tirupattur, India*



Center for Research & Publications
Holy Cross College (Autonomous)

Affiliated to Bharathidasan University
Nationally Accredited (4th Cycle) with A++ Grade (CGPA 3.75/4) by NAAC
College with Potential for Excellence
Tiruchirappalli - 620 002, Tamilnadu, India.

UGC STRIDE COMPONENT 1

Capacity Building of Young Talent in Transdisciplinary Research for a Sustainable Development of Society

FDP WEBINAR SERIES - III

Certificate of Participation

Awarded to


Dr.K.KUMAR

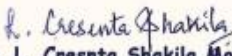
Assistant Professor

A.V.V.M.Sri Pushpam College

(Autonomous) Poondi, Thanjavur

for participation in the FDP Webinar Series III
for Faculty, Research Scholars and Students held during 13th - 18th July 2020


Dr. Sheila Cristopher
Project Coordinator
UGC - STRIDE


Dr. L. Cresanta Shakila Motha
Project Co - Coordinator
UGC - STRIDE


Dr. (Sr.) A. Christina Bridget
Principal
Holy Cross College (Autonomous)
Tiruchirappalli

ANNEXURE - III



SINCE 1954

National Level Conference
"Recent trends in Exploration, Achievement and
Developments in Biological Sciences"
("READ - 2012")

CHIKKAIAH NAICKER COLLEGE

ERODE - 638004

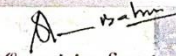
March 9th and March 10th, 2012.



ज्ञानः विज्ञानं विमुक्तये

This is to certify that Mr./Mrs./Dr. K.Kumar, Dept. of Zoology, A.V.V.M.
Sri pushpam college, Poondi has Participated and presented a paper in National Level
Conference on "Recent trends in Exploration, Achievements and Developments in Biological Sciences" organized by University Grants Commission,
New Delhi, Department of Science and Technology, New Delhi, Tamilnadu State Council for Science and Technology, Chennai and Flora (People of
Biology) at Chikkaiah Naicker College Erode - 638004, Tamil Nadu, India on March 9th and 10th 2012


Co organizer


Organizing Secretary


Principal



Indian Academy of Sciences
Bangalore



Indian National Science Academy
New Delhi



The National Academy of Sciences
Allahabad



SAIVA BHANU KSHATRIYA COLLEGE

(Aruppukottai Nadargal Uravinmurai Pothu Abiviruthi Trustukku Pathiyapattathu)

ARUPPUKOTTAI - 626 101

DEPARTMENT OF ZOOLOGY

Science Academies Lecture Workshop on "Modern Trends in Zoology and Agriculture Microbiology"

ATTENDANCE CERTIFICATE

This is to certify that Mr./Ms./Dr. K. KUMAR, Asst. Professor, Dept. of Zoology & Biotech
of A.V.V.M. SRI PUSHPAM COLLEGE, POONDI has participated in
the Science Academies Lecture Workshop on "Modern Trends in Zoology and Agriculture Microbiology" organized by the
Department of Zoology, Saiva Bhanu Kshatriya College, Aruppukottai held during 7th & 8th February 2017.

Dr. Ga. Sakavathiappan
Co-ordinator

Dr. N. Muthuselvan
Principal



A. VEERIYA VANDAYAR MEMORIAL SRI PUSHPAM COLLEGE (AUTONOMOUS)

POONDI - 613 503, THANJAVUR -Dt. Tamil Nadu.

(NAAC-Re-Accredited with 'A' Grade with 3.38 points)



PG & RESEARCH DEPARTMENT OF ZOOLOGY AND BIOTECHNOLOGY

UGC

NATIONAL CONFERENCE ON HEALTHCARE AND BIOTECHNOLOGY IN INDIA : EMERGING TRENDS AND CHALLENGES (HBIETC-2017)

Sponsored By
UNIVERSITY GRANTS COMMISSION

Certificate

This is to certify that Mr./Ms./Prof./Dr. K. KUMAR, Assistant Professor of zoology,
A.V.V.M. Sri Pushpam college (A), Poondi has participated / presented a paper / poster / delivered a
special lecture entitled _____

in the National Conference On "Healthcare And Biotechnology In India : Emerging Trends And Challenges (HBIETC-2017)"
organized by PG and Research Department of Zoology and Biotechnology held on 17th & 18th August, 2017 at
A.V.V.M Sri Pushpam College, (Autonomous) Poondi - 613 503, Thanjavur (Dt.), Tamil Nadu, India.

Dr. S. GANESAN
Organising Secretary

Dr. R. RAJAKUMAR
Convener

Dr. V.S. NAGARETHINAM
Dean of Sciences

Dr. R. DAMODARAN
Principal



A. Veeriyar Vandayar Memorial Sri Pushpam College (Autonomous)

Reaccredited by NAAC 'A' Grade 3.58 CGPA
Poondi - 613 503, Thanjavur Dt., Tamil Nadu, India



PG AND RESEARCH DEPARTMENT OF ZOOLOGY & BIOTECHNOLOGY

NATIONAL CONFERENCE ON
TRENDS IN HEALTHCARE AND BIOTECHNOLOGY: OPPORTUNITIES & CHALLENGES (THBOC-2016)

Sponsored by
SCIENCE AND ENGINEERING RESEARCH BOARD (SERB), NEW DELHI

Certificate

This is to certify that /Mr./Ms./Prof./Dr. K. KUMAR, Asst. Professor of Zoology
And Biotechnology, A.V.V.M. Sri Pushpam College, Poondi
has participated/presented a paper/poster/ delivered a special lecture entitled

..... in the
National Conference on "Trends in Healthcare and Biotechnology: Opportunities and Challenges (THBOC-2016)" organized by
PG and Research Department of Zoology and Biotechnology held on 22nd & 23rd January, 2016 at A.V.V.M. Sri Pushpam College
(Autonomous), Poondi - 613 503, Thanjavur (Dt.), Tamil Nadu.

Dr. S. Ganesan
Organizing Secretary

Dr. R. Damodaran
Convener

Dr. C. Robert Alexander
Dean (Sciences)

Dr. S. Udayakumar
Principal



BHARATHIDASAN UNIVERSITY

(Accredited with A+ grade by NAAC in third cycle)

School of Lifesciences, Department of Biochemistry

Organized

DST-PURSE Sponsored One day Workshop on "Introductory course on
surgical models of Ageing disorders - special emphasis on Brain and Heart"

This is to certify that Mr./Ms./Dr. KUMAR, K
has participated/Volunteered in Organizing One day workshop on "Introductory course on surgical
models of Ageing disorders- special emphasis on Brain and Heart" on 20th December 2021
held at Department of Biochemistry organized by the Molecular Neurogerontology Laboratory,
Bharathidasan University, Tiruchirapalli-620024, Tamilnadu, India.

Dr. G. Gopinath
Registrar

Dr. N. Thajuddin
DST-PURSE Co-ordinator

Dr. V. Ravikumar
Head of the Department

Dr. M. Anusuyadevi
Organizing Secretary

Dr. K.S. Jayachandran
Co-ordinator

Dr. K. Mahesh
Co-ordinator

**National Conference on
INTELLECTUAL PROPERTY RIGHTS IN BIODIVERSITY AND BIOTECHNOLOGY (IPRBB-2015)**

Supported and
Sponsored by

Organized by

PG AND RESEARCH DEPARTMENT OF ZOOLOGY & BIOTECHNOLOGY

(DST-JIST sponsored Department)

A.V.V.M. SRI PUSHPAM COLLEGE (Autonomous)

Reaccredited by NAAC with 'A' Grade 3.38 CGPA (3rd Cycle)

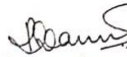
Poondi - 613 503, Thanjavur, Tamilnadu, India


Certificate



This is to certify that Dr./Mr./Ms./Mrs. K. Kumar Asst. Prof.
Department of Zoology has participated / presented a research paper / delivered
a guest lecture entitled in the
National Conference on "Intellectual Property Rights in Biodiversity and Biotechnology (IPRBB-2015)" organized by
PG and Research Department of Zoology and Biotechnology, A.V.V.M. Sri Pushpam College (Autonomous), Poondi - 613 503,
Thanjavur (Dt.) on 15th - 16th September, 2015.


Dr. R. Kaleswarar
Organizing Secretary


Dr. R. Damodaran
Convener


Dr. C. Robert Alexander
Dean (Sciences)


Dr. S. Udayakumar
Principal



SRTLS - 2016

**A. VEERIYA VANDAYAR MEMORIAL
SRI PUSHPAM COLLEGE (AUTONOMOUS)**

POONDI - 613 503, THANJAVUR -Dt. Tamil Nadu.

(NAAC-Re-Accredited with 'A' Grade with 3.38 points)

**P.G & RESEARCH DEPARTMENT OF ZOOLOGY AND BIOTECHNOLOGY
SEMINAR ON RECENT TRENDS IN LIFE SCIENCES**

(SRTLS - 2016)



Certificate

This is to certify that Prof/Dr/Mr/Ms K. KUMAR
Assistant Professor of Zoology has participated / presented a paper entitled

.....
in the **SEMINAR ON RECENT TRENDS IN LIFE SCIENCES (SRTLS-2016)** organized by the P.G & Research
Department of Zoology and Biotechnology, A.V.V.M Sri Pushpam College (Autonomous), Poondi ,
Thanjavur District, on 22nd August - 2016.


Dr. R. RAJAKUMAR
Organising Secretary


Dr. S. UDAYAKUMAR
Principal

Available online at <http://www.harmanpublications.com>**World Journal of Science and Research**

Harman Publications. All rights reserved



Research Article

Zoology

EFFECT OF SPIRULINA SUPPLEMENTATION ON NUTRITIONAL INDICES PARAMETERS IN SILKWORM, *BOMBYX MORI* (L.)K. Kumar¹, U. Balasubramanian²,¹Research scholar, P.G and Research Department of Zoology and Biotechnology,

A.V.V.M. Sri Pushpam College (Autonomous), Poondi-613 503, Thanjavur Dt.

²Department of Zoology, A.V.V.M. Sri Pushpam College (Autonomous), Poondi-613 503, Thanjavur Dt. Tamil Nadu, South India.³Corresponding author: kumartamizhan-kumar@gmail.com**ABSTRACT**

To find out the effect of Spirulina on nutritional indices in silkworm. In the study of bioenergetics profile, it was found that the consumption, assimilation, metabolism, rate of consumption, assimilation and metabolism were found to decrease in *Spirulina* supplementation. The production, production rate, assimilation efficiency (AE), the efficiency for conversion ingested food (ECF) and conversion of digested food (ECD) were found to increase in *Spirulina* supplementation. In other words the larvae consumed less mulberry leaves were supplemented with *Spirulina*, a higher quantum of tissue production was noted. A possible explanation for this phenomenon is that larvae that fed on mulberry leaves supplemented with *Spirulina* allocated minimum energy for maintenance and channelled maximum energy towards tissue production. It is hoped that the results of this study on supplementation of 5% *Spirulina* to silkworm to be beneficial to sericulture industry in India by ultimately increasing the quantum of quality silk production economically.

Chien: Kumar K and Balasubramanian U (2015) Effect of *Spirulina* supplementation on nutritional indices parameters in silkworm, *Bombyx mori* (L.) World Journal of Science and Research 1(2): 41-48.

Article Info:

Received on 09 Oct. 2015

Accepted on 25 Nov. 2015

Keywords:Metabolism, Silkworm, *Spirulina*, Nutritional indices, Bioenergetics***Corresponding author**U. Balasubramanian
Department of Zoology,
A.V.V.M. Sri Pushpam
College (Autonomous),
Poondi-613 503,
Thanjavur Dt.**INTRODUCTION**

Geographically, Asia is the main producer of silk in the world and produces over 90% of the total global output. Sericulture in India is practiced predominantly in tropical environmental regions such as Karnataka, Tamil Nadu, Andhra Pradesh, and West Bengal and to a limited extent in the temperate environment of Jammu and Kashmir (Kumar *et al.*, 2011). The silk worm is a beneficial insect reared for the valuable commodity silk. The silk industry plays

an important role in the Indian rural economy, so research on silkworm and mulberry crop enhancement is of high importance (Hware, 2001).

In developing countries like India, agriculture and agro-based industries play a vital role in the improvement of rural economy. The limited availability of land, the limited cash returns, and agriculture being confined to one or two seasons in the year, have made villages to look for supporting



ISSN: 2257-3229
(IJFAS) Impact Factor: 3.42
(SJIF) Impact Factor: 6.302
IJFAS 2015; 3(2): 50-54
© 2015 IJFAS
www.ijfashournal.com
Received: 21-07-2015
Accepted: 29-08-2015

R SripriyaP.G. and Research Department
of Zoology and Biotechnology,
A.V.V.M. Sri Pushpam college
(Autonomous), Poondi, 613 503,
Thanjavur Dt., Tamil Nadu,
India.**K. Kumar**P.G. and Research Department
of Zoology and Biotechnology,
A.V.V.M. Sri Pushpam college
(Autonomous), Poondi, 613 503,
Thanjavur Dt., Tamil Nadu,
India.**R. Rajendran**P.G. and Research Department
of Zoology and Biotechnology,
A.V.V.M. Sri Pushpam college
(Autonomous), Poondi, 613 503,
Thanjavur Dt., Tamil Nadu,
India.**Seasonal Variation of Serum Enzymes of Indian Freshwater Eel *Anguilla bicolor* (McClelland)**

R Sripriya, K. Kumar, K. Rajendran

Abstract

Serum enzymes are important aspects in the management of live species such as *Anguilla bicolor*. The objective of this survey was to discuss the serum enzymes. From this investigation the acid phosphatase of *A. bicolor* showed a slight seasonal fluctuation, the ACP was found maximum value (5.66 ± 0.49 IU/L) was obtained in summer 2011 and minimum value (3.9 ± 0.32 IU/L) in monsoon 2010; ALP, it was found high (150.56 ± 1.58 IU/L) in post monsoon 2011 and low (107.4 ± 1.32 IU/L) in premonsoon 2011; SGOT the minimum values (23.51 IU/L) was obtained in postmonsoon 2010 and maximum (31.51 IU/L) in summer 2011; SGPT showed a slightly the highest value (33.6 ± 1.21 IU/L) was recorded in monsoon 2010 and lowest value (23.9 ± 1.01 IU/L) in summer 2010; LDH was found to be higher value (77.7 ± 1.58 IU/L) was recorded in summer 2010 and lowest value (61.2 ± 1.21 IU/L) in monsoon 2010 was marked seasonal variations during the two years of the study period. Hence, the present study suggested that this fish are important sources and good for human health.

Keywords: *Anguilla bicolor*, ACP, ALP, SGOT, LDH, SGPT

1. Introduction

The eels are considered as a luxury food and consumed as a delicacy in several Asian and European countries. The Japanese eel, *Anguilla japonica* is cultured commercially in Japan, Taiwan, and South Korea and the European eel, *Anguilla anguilla* in Italy, Denmark, West Germany, France and Holland. Like all living species, fish too need nutritious food. There are a number of varieties of fish food available in the stores today. The feeding of fish and their nutrition is one of the most important factors in keeping them healthy. The study on enzyme characteristics with reference to acid and alkaline phosphatase, SGPT, SGOT and LDH, in fishes have been extensively studied by many workers (Heggen, 2005; Weiskler *et al.*, 2007; Mandal *et al.*, 2010 and Kumar *et al.*, 2012) [1, 2, 3, 4, 5]. It is invariably observed that the enzyme activities of fishes increased with fish size and diet (Srivastava *et al.*, 1989; Lamas *et al.*, 1991; Rostad *et al.*, 1993; Madhala *et al.*, 1997; Saravanan *et al.*, 2012) [6, 7, 8, 9]. Enzyme activity was found to be more or less when good quality of water is maintained in aquaculture practice (Siddik *et al.*, 1990; Modha *et al.*, 1993; Sripriya *et al.*, 2012a) [10, 11, 12]. Effect of physico-chemical parameters and seasonal variation on enzyme activities of fishes have also been reported (Singh and Srivastava, 1999; Gabriel *et al.*, 2012) [13, 14]. Acute and chronic effect of toxicants on enzyme activity of various fish species (*Channa punctata* (Sastri and Malik, 1981) [15], *Channa striata* (Sudha *et al.*, 1985) [16], *Labeo rohita* (Rajan, 1990) [17], *Sarotherodon murrembicus* (Goparadda *et al.*, 1992 and Shalika *et al.*, 1993) [18, 19], *Clarias garipinatus* (Digaigi Ghazikhan and Azra, 2007) [20] have been documented. Activity of LDH in the brain and liver of *Labeo rohita* have been studied (Das and Kishore, 2002) [21]. Kapila *et al.* (2002) [22] studied the impact of temperature variation on serum enzyme of *Schizothorax richardsoni*. Activity of acid and alkaline phosphatase in fresh water fish *Ceriodon marginatus* have been reported (Das *et al.*, 2004) [23]. Azei (2005) [24] observed ALP activity in freshwater fish *Oreochromis niloticus* exposed to cadmium. Activity of phosphatase in air breathing catfish *Heterotis niloticus* have been studied (Palanisamy *et al.*, 2012) [25]. Magar and Aliur Shauk (2013) [26] reported effect of Malathion on acid phosphatase activity of fish *Channa punctata*. Though, information is available on haematology and enzymes of fishes all over the world, the works pertaining to seasonal changes in haematology, haematocrit, and enzymes of eel fishes is meagre. Hence the present investigation is aimed to study the enzymes of fish *Anguilla bicolor*.

ISSN 2220-7012
JES-2014-2(4)-278-282
© 2014 JES
Received: 25/06/2014
Accepted: 10/07/2014

K. Kumar
Research scholar, P.G. and Research
Department of Zoology and
Biotechnology, A.V.V.M. Sri
Pushpan College (Autonomous),
Poonchi-613 503, Thanjavur Dt.,
Tamil Nadu, India.

U. Balasubramanian
Dean, Faculty of Sciences, A.V.V.M. Sri
Pushpan College (Autonomous),
Poonchi-613 503, Thanjavur Dt.,
Tamil Nadu, India.

Correspondence
K. Kumar
Research scholar, P.G. and Research
Department of Zoology and
Biotechnology, A.V.V.M. Sri
Pushpan College (Autonomous),
Poonchi-613 503, Thanjavur Dt.,
Tamil Nadu, India.

Supplementary effect of *Spirulina* on lipids and enzymes in silk gland of silkworm, *Bombyx mori* (L.)

K. Kumar, U. Balasubramanian

Abstract
Silk gland is the organ for synthesizing and secreting silk protein. This organ's growth reflects ability of silk production, both in quality and quantity. The present study conducted to investigate the supplementary effect of *Spirulina* on lipids and enzymes in salivary gland of silkworm, *Bombyx mori* (L.). The silkworm larvae were fed with different concentrations (1, 3 and 5%) of *Spirulina*. At the end of the experimental period, the silk gland was dissected out and weighed. Prepared silk gland homogenate was used for analysis of various biochemical parameters such as triglycerides, phospholipids, total lipids, protein and enzymes lipase and alkaline phosphatase activity. All the biochemical and enzymatic parameters were observed in positive correlation in 5% supplemented *Spirulina* as compared with 1 and 3 % supplementation thus indicating the positive effect of *Spirulina* due to enriched nutrient content.

Keywords: Silkworm, Silk gland, *Spirulina*, lipids

1. Introduction

Silkworm is an economically important insect which produces silk filament. It is used as the model insect for establishing the mechanism of both inside hormones and outside hormones and their analogues [1]. In past several decades, entomologists studied the roles of different hormones and their analogues to use these hormones to regulate insect growth and development [2].

Silk gland is the organ for synthesizing and secreting silk protein. This organ's growth reflects ability of silk production, both in quality and quantity. Reports on available on some kind of hormone administration such as juvenile hormone that will increase the growth of silk gland and improve the cocoon quality, i.e., cocoon weight, shell weight, and shell ratio [3]. Various hormones have been reported to exert profound influence on carbohydrate and lipid metabolism of insects [4]. Lipid concentration in pupal hemolymph of different races of *Antheraea mylitta* was studied [5]. The mulberry silkworm, *Bombyx mori* has a pair of salivary glands arising from the mandibular segment, in addition to the labial silk glands which are generally considered as modified salivary glands. The two independent salivary glands made up by 330 cells, grow about 1000 fold during larval development. The silk glands are functionally divided into three distinct compartments, the anterior (ASG), middle (MSG) and posterior (PSG) silk glands. PSG synthesizes the silk structural proteins, the fibroin I and II chains and fibroinase (formerly known as P25), whereas the MSG synthesizes the glue proteins, sericin 1 and 2. The ASGs serve as ducts to carry the silk protein to the silk spinning apparatus [6].

The alkaline and acid phosphatase activity of silkworm was reported by Srithara and Iliat [7]. The alkaline phosphatase activity was low during larval molting stage and increased gradually after molting [8]. The activity of ALKP exhibited positive relationship to the cocoon quality of silkworm. Therefore, ALKP may be used as biochemical index to evaluate health and economic characters of the silkworm [9].

The quality of the leaves has a profound effect on the superiority of silk produced by the *B. mori* L. Hence, in the present study, an attempt has been made to analyze the effect of different concentrations (1, 3 and 5%) of *Spirulina* on the growth and lipid profiles of silk gland, the mid-gut biochemical composition of silkworm, *B. mori* L.

~ 278 ~

World Journal of Science and Research. 1(2): 50-62 (2014)

ISSN: 2455 2208



Available online at <http://www.harmanpublications.com>

World Journal of Science and Research

Harman Publications. All rights reserved



Research Article

Zoology and Biotechnology

ANALYSIS OF MICRO AND MACRO NUTRIENTS ON VERMICOMPOSTING OF *Eudrilus eugeniae* AND *Eisenia fetida* BY USING INDUSTRIAL TEA WASTE WITH COW DUNG AND KITCHEN WASTE MIXTURE

G. N. Emperor*, K. Kumar

P.G. and Research Department of Zoology and Biotechnology,
A.V.V.M. Sri Pushpan college, poonchi-613 503, Thanjavur (Dt),
Tamil Nadu, India

*Corresponding Author: emperor96@yahoo.in

ABSTRACT

From the present investigation it could be suggested that the underutilized tea waste, cow dung, kitchen waste can also be profitably utilized for the production of nutrient. Further, from the nutrient analysis of the vermicompost it could be deduced that not all the concentrations of TW+CD+KW are equally accepted and processed by *E. eugeniae* and *E. fetida* as a consequence resulting in differential mineralization rate between the treatment concentrations. The pH, EC, TOC, C:N ratio, macro and micro nutrients in different concentrations of industrial tea waste, cow dung and kitchen waste mixtures. Initial, worm inoculated natural compost (control) and vermicompost of *E. eugeniae* and *E. fetida* were analyzed. The observation of chemical analysis of the different mixtures of industrial tea waste, cow dung and kitchen waste before vermicomposting revealed N,P,K, Ca, mg, Na, Zn, Fe, Cu & Mn to be more in T-4 and T-5 treatment than the other treatments (T1 – T2). Hence, it can be concluded that the quality of vermicompost partly depends upon quality of organic wastes used for vermicomposting and partly upon the rate of degradation of organic wastes by the combined effects of earthworm and microbial activities.

Keywords: G. N. Emperor and K. Kumar (2014). Analysis of micro and macro nutrients on vermicomposting of *Eudrilus eugeniae* and *Eisenia fetida* by using industrial tea waste with cow dung and kitchen waste mixture. World Journal of Science and Research. 1 (2): 50-62.

Article Info:

Received on 10th June 2014
Accepted on 07th July 2014
Online July 2014

Keywords:
Vermicompost,
Eudrilus eugeniae and
Eisenia fetida, Na,
NPK, Mg, EC

*Corresponding author
G. N. Emperor, P.G. and
Research Department of
Zoology and
Biotechnology,
A.V.V.M. Sri Pushpan
college, poonchi-613
503, Thanjavur (Dt),
Tamil Nadu, India.

INTRODUCTION

Vermicomposting is an effective biological process for conversion of organic wastes into a stable end product, where in microbial activity plays an essential role. Increasing civilization and urbanization has led to an increase in the generation of wastes, there by polluting environment from various sources. Disposal and environmental friendly management of these wastes has become a serious global problem. Much attention has been paid in recent years to develop efficient low input

technologies to convert nutrient rich organic wastes into value-added products for sustainable land practices (Kale *et al.*, 1982; Daniel *et al.*, 1999; Padma *et al.* 2002; Garg and Kanishk, 2005).

Researchers from various part of the world have contributed to the knowledge of vermicomposting technology and benefits of vermicomposting organic wastes originated from animals, plants, agriculture, agroindustries, plant based industries, urban sewage etc. The research



ISSN 2278 -1358

Original Article

STUDIES ON THE NUTRITIONAL SUPPLEMENTATION OF SPIRULINA TREATED MR2 MULBERRY LEAVES FED BY V INSTAR LARVAE OF SILKWORM, *BOMBYX MORI* (L.) IN RELATION TO FEED EFFICACY AND GROWTH RATE

K. Kumar¹, U. Balasubramanian²,

¹Research scholar, P.G. and Research Department of Zoology and Biotechnology,

A.V.V.M. Sri Pushpam College (Autonomous), Poondi-613 503, Thanjavur Dt.,

²Dean, Faculty of Sciences, A.V.V.M. Sri Pushpam College (Autonomous), Poondi-613 503, Thanjavur Dt. Tamil Nadu, South India.

³Corresponding author: kumartamizhan.kumar@gmail.com

Received 11 April 2014; accepted 08 May 2014

Abstract

Geographically, Asia is the main producer of silk in the world and produces over 90% of the total global output and the life of many people is dependent on it. Increase of larval feed efficacy and growth rate would result better economics for silk industry and meet the production needs. Silkworm *B. mori* is an important economic insect and also a tool to convert leaf protein into silk protein. This study was carried out to determine the feed efficacy and growth rate of silkworm *B. mori* (V instar larvae) fed by MR2 mulberry leaves and different concentrations of spirulina treated MR2 mulberry leaves. Group I larvae received MR2 mulberry leaves sprayed with distilled water and served as control, group II, III and IV larvae received 1%, 3% and 5% spirulina sprayed MR2 mulberry leaves, respectively. Fresh MR2 mulberry leaves were sprayed by each concentration and were fed to silkworms, V instar larvae, four feedings/day. To evaluate the physiological traits like food consumption rate, food utilization rate, digestibility rate, food consumption index and coefficient of food utilization, growth rate of larval, larval duration, spinning days and pupal parameters were analyzed by using one way analysis of variance (ANOVA) followed by Duncan's multiple range tests. In the present study, it has been observed that the feed efficacy and growth rate of silkworm larvae (V instar), enhanced by 5% spirulina treated group than control and other Spirulina treated groups (1% and 3%). This study has been indicated that the Spirulina exhibits the presence of certain growth stimulant activity and can be used to increase the feed efficacy in commercial silkworm rearing with reference to sericulture.

© 2014 Universal Research Publications. All rights reserved

Key words: *Bombyx mori*, Mulberry, Spirulina, Feed efficacy, Growth rate.

1. INTRODUCTION

Silkworm *Bombyx mori* is an important economic insect for silk production and also a tool to convert leaf protein into silk. The industrial and commercial use of silk, the historical and economic importance of production and its application in all over the world finally contributed to the silkworm promotion as a powerful laboratory model for the basic research in biology [1]. The leaves of *Morus* species are the sole source of the food for silkworm, *Bombyx mori*. L. Nutritional quality of leaves plays a vital role in determining the health and growth of the larvae. The feeding of nutritionally enriched leaves showed better growth and development of silkworm larvae, as well as

directly influence on the quality and quantity of silk production [2]. Nearly 70% of the silk proteins produced by silkworm are directly derived from the protein of mulberry leaves [3]. The silkworm larvae are highly sensitive and respond sharply to the changes of the leaf quality. Variations in the quality of the mulberry leaves and climatic factors are many times reflected on the performance of the cocoon production.

Mulberry leaf supplemented with *Spirulina* as a feed to *B. mori* L. (Lepidoptera: Bombycidae) orally found to be effective in enhancing the larval and cocoon characters. *Spirulina*, blue-green algae contains 18 amino acids viz., glutamine, glycine, histidine, lysine, methionine,

13

International Journal of Research in Zoology 2014; 4(2): 13-18

Int.J.Curr.Microbiol.App.Sci (2015) 4(10): 496-507

International Journal of Current Microbiology and Applied Sciences
 ISSN: 2319-7706 Volume 4 Number 10 (2015) pp. 497-506
<http://www.ijcmas.com>



Original Research Article

Microbial Population and Activity on Vermicompost of *Eudrilus eugeniae* and *Eisenia fetida* in Different Concentrations of Tea Waste with Cow Dung and Kitchen Waste Mixture

G. N. Emperor* and K. Kumar

P.G. and Research Department of Zoology and Biotechnology, A.V.V.M. Sri Pushpam College, Poondi-613 503, Thanjavur (Dt), TamilNadu, India

*Corresponding author

ABSTRACT

Microorganisms are essential part of biodiversity and play a significant role in structuring and functioning of the ecosystem on the environment. In the present investigation an attempt was analysed in the vermicompost microbial population such as Bacterial, fungal and Actinomycetes and its activities. From the present work was found to the total microbial population of vermicompost of *Eudrilus eugeniae* and *Eisenia fetida* from T1-T4. Among the different treatment T4 and T3 treatments were found to have significantly ($P < 0.05$) higher microbial population than T2 and T1 treatments. In the present analysis the microbial activity of vermicompost obtained from all the treatments T1-T4 were increased significantly ($P < 0.05$) and especially in T4 of *E. eugeniae* (7.32 ± 0.31) and *E. fetida* (6.92 ± 0.59) and T3 of *E. eugeniae* (6.60 ± 0.05) and *E. fetida* (5.95 ± 0.63) treatments were found to be significantly ($P < 0.05$) higher than T2, T1 treatments. The present study also the fungal population is found to be significantly higher in the fresh vermicompost obtained from treatments T1-T4. The bacterial population was found to be significantly greater in the fresh vermicompost obtained from the treatments T1-T4. The actinomycetes population was found to be significantly greater in the fresh casts obtained from the treatments T4.

Keywords

Vermicast,
 Bacteria, Fungi,
 Actinomycetes,
 TW, CD, KW,
Eudrilus eugeniae,
Eisenia fetida

Introduction

Microorganisms are essential part of biodiversity and play significant role in structuring and functioning of the ecosystem on the environment. The microorganisms (mainly bacteria, fungi, actinomycetes) are the primary decomposer of organic wastes. The microorganisms not only mineralize complex substances (organic waste) into plant available form but also can synthesis whole series of biologically active

substances (Pramanik *et al.*, 2007). Microbes are responsible for the biochemical degradation of the organic matter. Earthworms are the important drivers of the process, conducting the substrate (organic wastes), producing congenial conditions for the activities of microbes and altering biological activity (Aira *et al.*, 2002).



Impact of different concentrations of spirulina supplemented diet on the biochemical profile of haemolymph of silk *Bombyx mori* L.

K. Kumar^{1*}, S.V. Bakkiya Lakshmi²

^{1,2} Assistant Professor, P.G. and Research Department of Zoology and Biotechnology, A.V.V.M. Sri Pushpam College (Autonomous) (Affiliated to Bharathidasan University) Poondi, Thanjavur District Tamil Nadu, India

Abstract

Silkworm (*Bombyx mori*) is a highly domesticated and economically important insect which is the primary producer of silk. Apart from silk production *Bombyx mori* had a lot of applications in biological and scientific research. Hemolymph is the circulating fluid of insects, similar to mammalian blood, which moves through the open circulatory system, directly bathing the organs and tissues. The mulberry silkworm, *Bombyx mori*, has been raised for more than 5000 years in Asian countries, and is a major economic resource for many families. In the present investigation an attempt was made to study the effect of different concentrations (1, 3 and 5%) of Spirulina as supplementary diet on the silk production and biochemical profile of haemolymph of silk *Bombyx mori* L. In the study biochemical parameters such as glucose, protein, cholesterol, ALT and AST were found to be significantly increased in haemolymph that had been fed on Spirulina supplemented. The increased content of this biochemical parameters had positive relationship to physiological function of the insects.

Keywords: silkworm, *Bombyx mori*, haemolymph, biochemical profile

1. Introduction

Silkworm (*Bombyx mori*) is a highly domesticated and economically important insect which is the primary producer of silk. Apart from silk production *Bombyx mori* had a lot of applications in biological and scientific research. The silk industry plays an important role in the Indian rural economy, so research on silkworm and mulberry crop enhancement is of high importance^[1]. Silks are fibrous proteins synthesized in specialized epithelial cells that line glands in these insects^[2]. The silkworm larva has a high medicinal value and is usually used to reduce blood pressure, diabetes, nerve disorder and heart problems, in addition, the major uses of its larvae for silk production^[3].

The silkworm has an open circulatory system containing hemolymph, which surrounds the tissues of the silkworm with blood. Hemolymph is the circulating fluid of insects, similar to mammalian blood, which moves through the open circulatory system, directly bathing the organs and tissues. Compared with mammalian blood, insect hemolymph differs in the absence of erythrocytes and has a high concentration of several types of free amino acids. The mulberry silkworm, *Bombyx mori*, has been raised for more than 5000 years in Asian countries, and is a major economic resource for many families. The haemolymph of insects performs several physiological functions such as immunity, transport and storage reserve. It serves as a transport milieu for the exchange of essential materials between cells and tissues and storage of many materials and essential for a variety of bodily functions such as molting and reproduction^[4]. In the present investigation an attempt was made to study the effect of different concentrations (1, 3 and 5%) of Spirulina as supplementary diet on the silk production and biochemical profile of haemolymph of silk *Bombyx mori* L.

2. Material and Methods

2.1 Mulberry leaves procurement

Mulberry includes a number of species and varieties. They differ in their suitability for silkworm rearing because of their varying nutritious value and palatability of the silkworm larvae. The mulberry plantation at Tamil Nadu Sericulture Training Centre, Nanjikkottai, Thanjavur is being well established with MR2 variety of mulberry, maintenance of which is through standard horticulture techniques. The mulberries were procured from this garden as per requirement.

2.2 Experimental animals

The egg cards of silkworm *B. mori* (cross breed: Local, a multivoltine x NB4D2, a bivoltine) were obtained from State Grainage Centre, Trichirappalli and Tamil Nadu Sericulture Training Centre, Nanjikkottai, Thanjavur, India. Silkworms were reared under standard conditions at 26±2°C. The mulberry leaves harvested at the irrigated mulberry garden were used as food for silkworms. Larvae were reared in plastic trays (70 larvae/tray) and were exclusively fed on mulberry leaves. Fresh mulberry leaves of MR2 variety were collected early in the morning and stored in wet gunny bags. They were chopped prior to feeding. The leaves were fed four times per day (6.30, 11.30, 16.00 and 22.00 hrs).

2.3 Spirulina

Spirulina platensis (*Arthrospira platensis*) powder was purchased from PARRY Nutraceuticals (Division of EID Parry (India) Ltd. at Panangudi, Pudukkottai Dist. Tamil Nadu, India and to prepare the experimental dose for 1, 3 and 5% concentrations.

126



JNROnline Journal
ISSN: 2320-3358 (e)
ISSN: 0972-5547 (p)

Journal of Natural Remedies
Vol. 21, No. 6(S1), (2020)

EVALUATION OF ANTIMICROBIAL ACTIVITY OF SILK SERICIN CAPPED SILVER NANOPARTICLES SYNTHESIZED FROM SILKWORM COCOONS SUPPLEMENTED WITH SPIRULINA

K. Kumar^{1*} and S. V. Bakkiya Lakshmi²

¹Assistant Professor, P.G. and Research Department of Zoology and Biotechnology, A.V.V.M. Sri Pushpam College (Autonomous) (Affiliated to Bharathidasan University) Poondi-613 503, Thanjavur District Tamil Nadu, India

²P.G. and Research Department of Zoology and Biotechnology, A.V.V.M. Sri Pushpam College (Autonomous) (Affiliated to Bharathidasan University) Poondi-613 503, Thanjavur District Tamil Nadu, India

*Corresponding author

ABSTRACT

Sericulture or silk farming is the rearing of silkworms for the production of raw silk. The silk worm is a beneficial insect reared for the valuable commodity silk. Sericin is a fine, horny, translucent, yellowish fiber. It is synthesized in different parts of middle divisions of silk glands. It belongs to a family of proteins having high content of hydroxyl amino acids. In the present study, anti-bacterial activity of SS-capped AgNPs against gram-positive and gram-negative and compared with the standard. The silk sericin (SS)-capped AgNPs were successfully synthesized in 1, 3 and 5% concentrations of Spirulina supplemented silkworm cocoon and SS-capped AgNPs showed potent antimicrobial activity against various gram-positive and negative bacteria and fungi. The highest activity was found to be in 5% concentrations of Spirulina supplemented silkworm cocoon. We therefore introduced the SS-capped AgNPs as a safe candidate for antimicrobial applications.

KEYWORDS: Silk glands, Silk sericin (SS)-capped AgNPs, Anti-bacterial activity

1. INTRODUCTION

Sericulture or silk farming is the rearing of silkworms for the production of raw silk. The silk worm is a beneficial insect reared for the valuable commodity silk. The silk industry plays an important role in the Indian rural economy, so research on silkworm and mulberry crop enhancement is of high importance^[1]. The silkworm larva has a high medicinal value and is usually used to reduce blood pressure, diabetes, nerve disorder and heart problems, in addition, the major uses of its larvae for silk production^[2].

The metallic nanoparticles are most promising as they show good antibacterial properties due to their large surface area to volume ratio, which is coming up as the current interest in the researches due to the growing microbial resistance against metal ions, antibiotics and the development of resistant strains^[3]. Silver nanoparticles used as drug disinfectant have some risks as the exposure to silver can cause argyria and argyria also; it is toxic to mammalian cells^[4]. Sericin is a fine, horny, translucent, yellowish fiber. It is synthesized in different parts of middle divisions of silk glands. It belongs to a family of proteins having high content of hydroxyl amino acids. The high polarity differentiates sericin from fibroin. Sericin is composed of serine (30%), aspartic acid and glutamic acid. It is readily soluble in hot water and dilute in alkali solution. It gets dissolved during the process of boiling of cocoons^[5]. In the present study, anti-bacterial activity of SS-capped AgNPs against gram-positive and gram-negative and compared with the standard.

2. MATERIAL METHODS