

Detailed Study on Deformity Effect of Diflubenzuron on Larvae of Black Hairy Catterpillar, *Pericallia ricini*

Lily Saroj Nathan^{1*}, A. K. Jaiswal¹ and Priyanka Vini Lall¹

DOI: 10.9734/bpi/cras/v5

ABSTRACT

The effect of diflubenzuron was evaluated on *Pericallia ricini* through oral and contact treatment under the laboratory condition. The results showed deformity in larvae and pupae to various degree and was correlated with concentration, but at higher concentration deformity rate was reduced due to high lethal action. Larvae were unable to moult and shrinkage was also exhibited due to the irregular chitin deposition. Abnormal larvae with reduced body size, unable to moult properly, with swollen larval body resulting into larval-pupal intermediates, due to incomplete metamorphosis.

Keywords: Larval-pupal intermediate; larval deformity; insect growth regulator; lepidoptera.

1. INTRODUCTION

Bihar hairy caterpillar. *Pericallia ricini* ((Fabricius), Lepidoptera:Noctuidae) is a serious pests of oilseeds, castor and cucurbitaceous crops. *Pericallia ricini* Fab. (Lepidoptera: Arctiidae) is a polyphagous pest of zinnia, balsam [1], castor, gingelly, cotton, country bean, drum stick, coccinia, banana, calotropis, sunflower, oleander, tea, sweet potato, pumpkin [2], brinjal, maize [3], and vanilla [4,5]. The female moths lay eggs in large number on the lower surface of leaf. The larvae feed on young and full grown plant leaves and fruits. In case of heavy infestation only stems and branches are left behind. Earlier some research workers have attempted to study the effect of diflubenzuron which is also chitin biosynthesis inhibitor [6], still adequate literature is lacking on the loss of crops by these pests which survive after sublethal exposure with these chemicals. Hence, the present study with the objective to assess the effective dose which causes deformity.

2. MATERIALS AND METHODS

Laboratory experiments were carried out, with diflubenzuron on 3rd and 5th instar larvae of *P. ricini*. The effect on deformity during moulting, metamorphosis and direct toxicity was assessed by treating the larvae through oral and contact (residual film). Five concentrations viz. 0.1, 1.0, 10, 50 and 100 ppm were tried for oral treatment and 0.002, 0.02, 0.2, 1.0 and 2.0 µg/cm² were tried with residual film and contact treatment against 3rd and 5th instar larvae of *Pericallia ricini*. The eggs of *Pericallia ricini* were collected from castor leaves and reared in the laboratory on castor leaves. Eggs were kept between two leaves in the wooden cages, (60x60x45cm) and fresh, clean fleshy leaves were provided daily as a food. After hatching, larvae started feeding on fresh leaves, the excreta and other waste were removed daily from cages. For the protection of larvae from ants, the rearing cages were placed on water filled pots (Earthen cups). Larvae were reared till it metamorphosed into pupa. Newly emerged adults were transferred to separate jars for oviposition. Honey mixed sugar solution (10%) soaked in a cotton ball, was provided in the plastic cavity (2x2x1 cm) for feeding the adults. Fresh castor leaves were placed in the glass chimney for egg laying. The females laid eggs on leaf surface. Such leaves along with eggs were transferred into another glass jar. The eggs were kept between fresh succulent castor leaves to provide food for hatching larvae easily and also to prevent leaves from rapid evaporation. Larvae were taken out from the cages and were starved for six hours. The

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Lac Insect Bionomics Its Natural Enemies and Lac Production

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DOI: 10.9734/bpi/rrab/v3

ABSTRACT

Kerria lacca Kerr. is the most common Indian lac insect of commercial importance. *Rangeeni* and *kusmi* are the two strains of *Kerria lacca*, both produce two crops in a year (bi-voltine). The lac insect belongs to the order Homoptera, family Tachardiidae (Kerridae) and, in the superfamily of Coccoidea. Therefore the structure and habit of young male lac insect differs significantly from its adult stage. The duration of different stages depends on strain of insect, season of the crop, species of host tree and location. The sex-ratio of male and female lac insect depends largely on lac crop and its season. The fertilized female lac prepares itself for oviposition (egg laying) inside the lac cell after long interval of time which differ from crop to crop. The lac insect shows ovo-viviparity i.e. it lays eggs, the young larvae after hatching remain inside the resinous lac cell. *Chrysopa* spp, and two lepidopteran, the *Pseudohypatopa pulvera* and *Eublemma amabilis* are the major insect-predators. Besides, *Tachardiaephagus tachardae*, *Coccophagus tschirchii*, *Aprostocetus purpureus*, *Eupelmus tachardiae*, *Parethrodryinus clavicornis* are the major parasitoid spp. Pruning of trees, lac insect inoculation, *phunki* removal, crop care and harvesting of mature lac crop are the major activities for lac cultivation.

Keywords: *Kerria lacca*; *Eublemma amabilis*; *Pseudohypatopa pulvereae*; *Chrysopa* spp; Shellac.

1. LAC INSECT

The lac insect a soft-bodied insect belongs to Coccoid group of order Homoptera. There are nine genera consisting of 88 species of lac insect found all over the world. There are two genera and 19 species observed in India. *Kerria lacca* Kerr. is the most common Indian lac insect of commercial importance. *Rangeeni* and *kusmi* are the two strains of *Kerria lacca*, both produce two crops in a year (bi-voltine). *Kusmi* strain prefers the *kusum* tree (*Schleichera oleosa*) and is also found on a few other trees but not on *palas* (*Butea monosperma*), whereas the *rangeeni* strain prefers the *palas* tree and is also found on a few other trees but not on *kusum*. The *rangeeni* strain insect matures once in October-November and thereafter in June-July, whereas the *kusmi* strain matures in January-February and then in June-July (Table 1).

Table 1. Different crops and their life period

Strain/ biotype	Crop	Season	Period		Approx. duration (Months)
			Raised (Inoculated)	Mature (Harvested)	
<i>Rangeeni</i>	<i>Katki</i>	Rainy	June-July	October- November	4
	<i>Baisakhi</i>	Summer	October- November	June-July	8
<i>Kusmi</i>	<i>Aghani</i>	Winter	June-July	January-February	6
	<i>Jethwi</i>	Summer	January-February	June-July	6
Trivoltine		Winter	October- November	March-April	5
		Summer	March-April	July-August	4
		Rainy	July-August	October- November	3

Source: Jaiswal et al. [1]

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Multiculturalism: A Model of Peaceful Coexistence

Sanjay Kumar Shukla*

I

The traditional notion of culture (*Sanskriti*) refers to the refinement of the human nature in a broad sense. There are three obvious and interconnected dimensions of 'culture' in this sense. There is first the process of improvement (*Samskâra or Sâdhanâ*) effected in man as an individual. In the second place, culture would have the sense of an objective order of rules, goals and symbols belonging to a specific society of men, which impels and guides the transformation of the individual, and lastly there is the historical tradition of that society and of mankind in general within which the specific socio-cultural order subsists as a changing form or structure. Culture is the social expression of value seeking symbolically expressive human consciousness. Religion and ethics constitute the primary value system, while language, ritual and art illustrate its symbolization. It is pressing need to raise the issue that why we witness cultural clashes in a pluralistic society. They are not constituted merely by the innumerable individuals with differing beliefs and practices. The cultural conflict is mainly due to narrow identification which diverts the self from its essential character of seeking self-realization, and this spiritual derailment produces conflicts of interests and imperfect communication between different cultural groups. Cultural difference is expressed in the terminology of identity, togetherness and difference. Identity is a specific interrelationship between self and otherness. Ethnocentrism means inscribing positive

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Basic and Applied Zoology

Sanjay C. Masih
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Beekeeping: Scope and Future Prospects

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Abstract

Beekeeping is being practiced traditionally since long time in India and currently, scientific beekeeping is an important component of present day strategies for integrated rural development which creates huge employability to the rural youth, women, school drop outs and tribals.

Albert Einstein once said: "If the bee disappears from the surface of the earth, man would have no more than four years to live. No more bees, no more pollination no more men!" so let us persistently exist on earth with honeybees while keeping them with us.

History

In Indian subcontinent consumption of bees and honey are common from the pre-historic ages. In our country, Veda, Ramayana, Koran has mentioned different uses of honey. Former Kings and Sultans used the symbol of bee as a mark of glory.

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First Edition 2021

ISBN : 978-93-89996-28-9

Published by:

NARENDRA PUBLISHING HOUSE

Publisher and Distributor

C-21, Varun Apartments, Sector-9, Rohini, Delhi- 110085 (INDIA)

Ph: +91-11-45025794, +919717874875

Email: info@nphindia.com, nphindia@gmail.com

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GREEN SYNTHESIS, CHARACTERIZATION AND APPLICATIONS OF NANOPARTICLES

Edited by
Ashutosh Kumar Shukla
Siavash Irvani

Micro & Nano Technologies Series



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CHAPTER

Safe nano is green nano

2

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1 INTRODUCTION

There is no doubt technology has brought great benefits to human society, making life easier with good health and communication. But, in spite of these benefits, people are upset because of the underlying threats some technologies pose to life. Ultimately, the benefits are in favor of comfort. In the same way, nanotechnology has created similar concerns. There needs to be control with regard to miniaturization at the nanoscale level and development of a large number of nanodevices. The situation should not get out of control. Eric Drexler's "gray goo" threat created a red alert among scientists. Although Drexler has explained that his gray goo scenario is the wrong issue to focus upon, there are still serious questions about sustaining life without any alternate sources of energy. At the same time, it is difficult for us to give up new technology that develops new treatments for cancer, controls genetic flaws, and produces new organisms capable of cleaning up toxic chemicals. We find that there are two faces of the same coin. There may be some applications of nanotechnology that will be harmful, producing serious environmental and health issues. It is a moral imperative for scientists to monitor nanotechnology development and, if the harm outweighs the benefits, experimentation should be curtailed. Policies should be enacted regarding all nanotechnology, which is expected to bring huge net benefits to man and society, and applications toward these ends should be encouraged.

नैनो टेक्नोलॉजी

विकास अथवा क्रांति

डॉ. शारदा सुन्दरम् संजय



Sharda Sundaram Sanjay
Ashutosh Kumar Shukla

Potential Therapeutic Applications of Nano-antioxidants

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Nanoparticles in Medicine

Ashutosh Kumar Shukla
Editor

 Springer

ISBN 978-981-13-8953-5 ISBN 978-981-13-8954-2 (eBook)

<https://doi.org/10.1007/978-981-13-8954-2>

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Precautions to Avoid Consequences Leading to Nanotoxification

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Sharda Sundaram Sanjay

8.1 Introduction

As a relatively new field of science and technology, nanomedicine has recently received a great boost and attracted considerable attention. Nanotechnology is the art of creation and utilization of materials and devices at the atomic or molecular level and supramolecular structures in the size range of 0.1–100 nm. Through exploitation of the unique properties of materials and devices developed in this size range, hundreds of consumer products incorporating nanoparticles are now on the market, including cosmetics, sunscreens, sporting goods, clothing, electronics, baby and infant products, and food and food packaging. Because of their specific characteristics, nanoparticles may penetrate cell walls and become involved in intra- and intercellular molecular processes. This has resulted in intensive and diverse applications of nanoparticles and nanomaterials in human medicine, known as nanomedicine. The aims of nanomedicine are to monitor, control, construct, repair, defend, and improve human biological systems at the molecular level, with the help of nanodevices and nanostructures that operate reactively in parallel at the cell level, in order to achieve medical benefits.

The specific definition of nanomedicine that was compiled by the Medical Standing Committee of the European Science Foundation (ESF) is "the science and technology of diagnosing, treating, and preventing disease and traumatic injury, of relieving pain, and of preserving and improving human health, using molecular tools and molecular knowledge of the human body" (ESF 2004). The five main disciplines of nanomedicine that the committee defined are (1) analytical tools; (2) nanosensing; (3) nanomaterials and nanodevices; (4) novel therapeutics and drug delivery systems; and (5) clinical, regulatory, and sociological issues. The US National Institutes of Health Roadmap for Medical Research in Nanomedicine (National Institutes of Health 2006)

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© Springer Nature Singapore Pte Ltd. 2020
A. K. Shukla (ed.), *Nanoparticles in Medicine*,
https://doi.org/10.1007/978-981-13-8954-2_8

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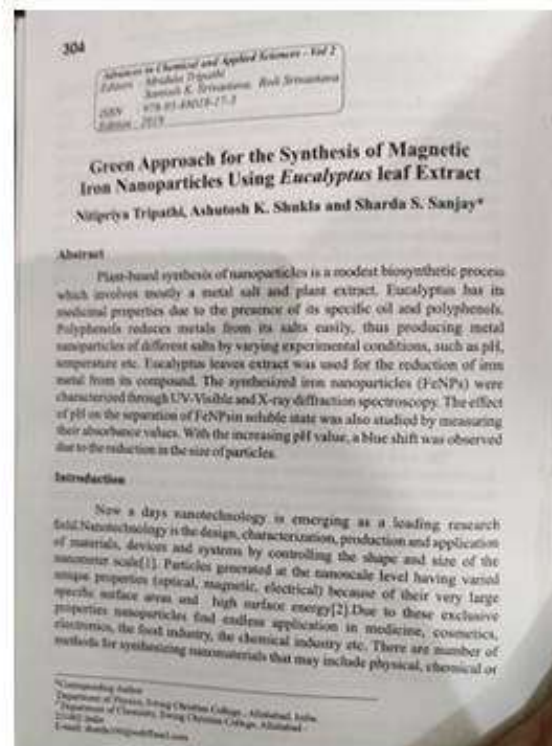
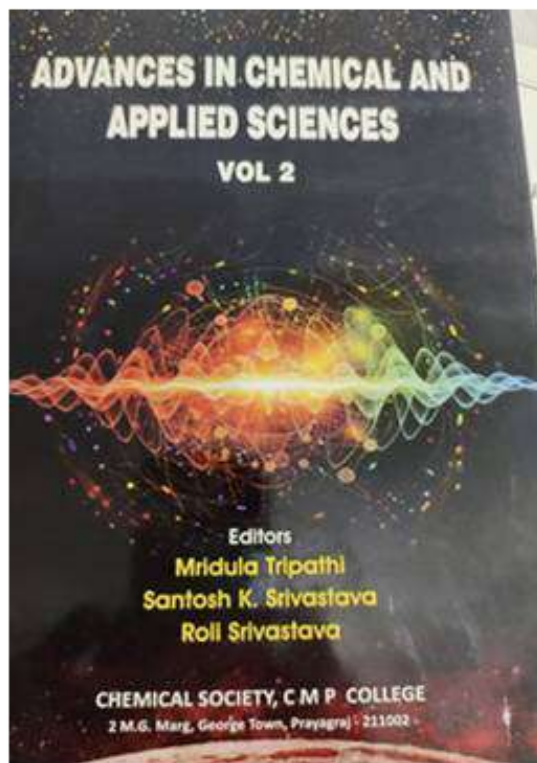
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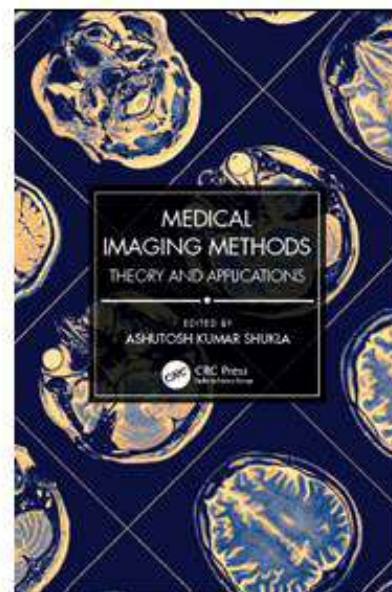
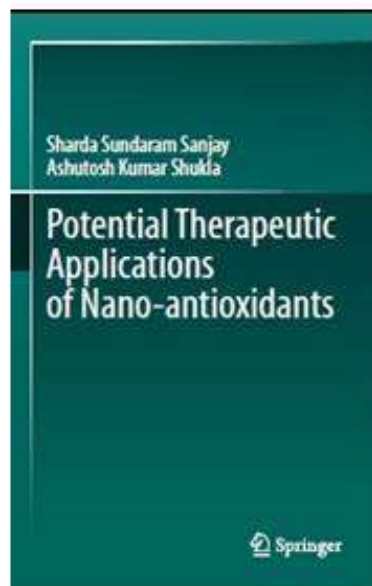
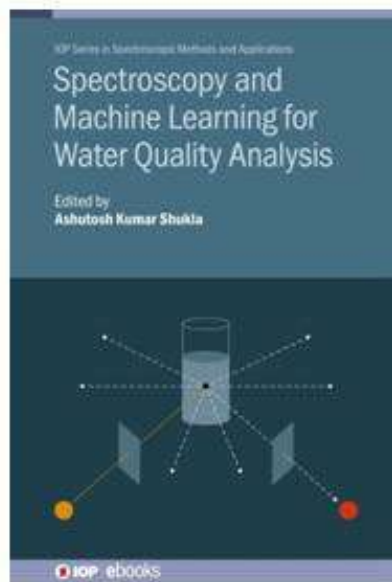
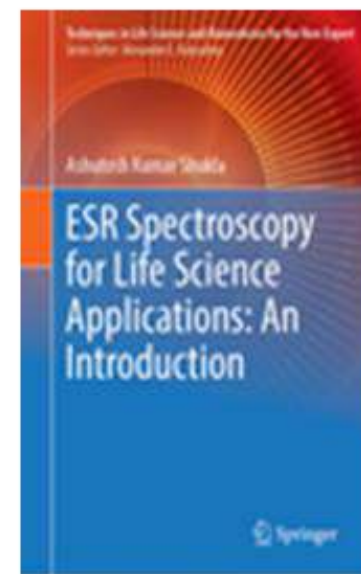
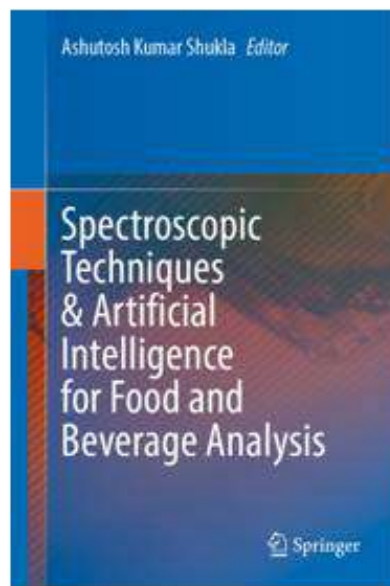
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Future Teachers Perspective about Various Concepts and Issues Related to Environmental Education

Justin Pradeep Sahae

Education is defined as the process of development, and environment is the aggregate of all the external conditions and influences affecting the life and development of man and other living organisms. Every organism has its own environment. In the context of Human beings, it consists of the physical as well as the social environment. Through Education the quality of the individual's environment can be modified to bring a desirable positive change in one's behavior.

According to UNESCO Working Committee (1970), "Environmental Education is the process of recognizing values and clarifying concepts in order to develop skills and attitude necessary to understand and appreciate the interrelatedness among man, his culture and his bio-physical surroundings. It also entails practice in decision making and self formulation of a code of behavior about problems and issues concerning environmental quality." Thus it prepares the individual and communities for life, through an understanding of the major problems of the interaction of the biological, physical, social, economic and cultural aspects of the individual and communities. It provides skills and attitudes needed to play a productive role in improving life and values, in order to enable people to enjoy good health and high quality of life. Hence, it is a process of providing learning experiences to obtain Knowledge, Understanding, Skills and Awareness with desirable attitudinal changes about man's relationship with his natural and manmade surroundings which includes the relation of population, pollution, resource allocation, transportation technology and rural-urban planning to the total human environment. It should help learners to discover the symptoms and real causes of environmental problems and thus to develop critical thinking and problem solving skills. It should

A Comparative Study of the two year B.Ed. programme: Annual System vs. Semester System

* Dr. Justin Pradeep Sahae

** Dr. Mahendra Mishra

INTRODUCTION

Teaching as a profession is as old as human race. Though it has been with us for such a long time, the professional preparation of teachers is probably a little less than two centuries old. It developed gradually and in different stages over these years. The traditional programmes, by and large, aim simply at initiating or inducting the would-be teachers to the tricks of the trade rather educating him in what makes the strength of a wholesome teacher, who may be alive to his role as teacher, who may also possess requisite attitude towards the profession and who may also possess requisite professional competencies and pedagogical perfection. As a result, most universities have modified these teacher training courses particularly with the intention of making teacher training more effective and meaningfully functional. Internship in teaching provides each student with comprehensive experiences for the development of his teaching competence and other skills. The system of internship in teaching may not be in the case of one year courses as it may be in the case of integrated courses of longer duration. Indeed, the move to make the teacher training programmes of longer duration gained momentum during post-independence period. Among the major problems concerning Teacher Education is the deficiency

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Awareness About Women Empowerment in Teacher Trainees

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Received : 02/06/2021

1st BPR : 10/06/2021

2nd BPR : 14/06/2021

Accepted : 18/06/2021

ABSTRACT

Social Stratification or Social Inequality is one of the stark realities of human society. It is existing in Indian Society since generations. Gender Inequality is one of the most prevalent social evil. After Independence, this discrimination is still continuing in spite of many democratic rights and laws. Women Empowerment is the need of the hour and many sincere efforts are being taken by the government and the general society, in large. Women Empowerment means emancipation of women from the grips of social, economical, political, caste and gender-based discrimination. It means developing a social environment free from the fear of exploitation, apprehension, discrimination and the feeling of persecution in a male dominated society. An important facet of Women Empowerment is Education which helps to develop the innate potential present in women and equips them with the skills, knowledge and training to raise their social and economic status. Thus the role played by Teachers becomes very important and crucial in strengthening women in society. Thus a very important part of the teacher education curriculum is to sensitize the future teachers i.e. teacher trainees about the various aspects of Gender Inequality, Gender Discrimination and Women Empowerment. Thus the paper attempts to analyze the awareness among future teachers about issues related to Women Empowerment. It may also throw some light on issues related to Girl child Education and its need and importance. It also tries to give suggestions about how the would-be-teachers can be sensitized about the need of Women Empowerment.

Introduction

One of the stark realities of human society is inequality or what the sociologists call social stratification. It has been existing in some form or other in all societies. In India, inequality of educational opportunities is a reality that has been existing for generations. There are three main sources of inequality in Indian Society: Caste, Class and Gender. Among these gender is the most universal because it is prevalent in caste and class also. Gender inequality, in simple words, may be defined as discrimination against women based on their sex. They are traditionally considered by the society as weaker sex. Women has been exploited, degraded, violated and discriminated both in our homes and in outside world. Women in India have made a considerable progress after Independence, but still they are struggling against many social evils in the male-dominated society. Many evil forces are still prevailing in the modern Indian society which hinder the progress of women and force them to struggle. Hence, in order to achieve the status of a developed country, India needs to transform its colossal women force into an effective human resource and this is possible only through the empowerment of women. Women Empowerment means emancipation of women from the grips of social, economical, political, caste and gender-based discrimination. It means, granting women the freedom to make life choices. It means strengthening her to participate in all activities with parity to men. It also means uplifting the status of women and making them feel safe against all forms of violence in the society. It means replacing patriarchy with parity. It means developing a social environment free from the fear of exploitation,

Sangam Lal Pandey : Depth Epistemology

Dr. Sanjay Shukla

I

Sangam Lal Pandey (1929-2002) is a well known Advaitic scholar, as he attempts to reformulate Āmkāra's Advaita Vedānta by purging it from certain shortcomings and inadequacies that had crept into it during the course of time. He is well trained and deeply rooted in the Indian philosophical tradition, but at the same time he has a perfect understanding of Western philosophy. His style of philosophizing is argumentative coupled with the distinct trait of comparative philosophy. He has joined the philosophy department as lecturer (1953) in Allahabad University and retired as Professor and Head (1990). He was appointed U.G.C. Emeritus Fellow in 1990 for two years. His philosophical contribution is immense and diversified as ranging from ontology, epistemology, ethics, aesthetics, logic, socio-political philosophy, philosophy of religion etc. *'Pre-Āmkāra Advaita Philosophy'*, *'Whither Indian Philosophy'*, *'Existence, Devotion and Freedom'*, *'Kānt Kā Darūana'*, *'Spinozā Kā Darūana'*, *'Nītiūāstra Kā Sarveksana'*, *'Ādhunika Darūana Kī Bhūmikā'*, *'Tarkauāstra Kā Paricay'*, *'Berkley Samgraha'*, *'Perennials of Comparative Philosophy'*, *'Dynamics of Indian Society'*, *'Vedāntic Social Philosophy'*, *'Samāj Darūana Kī Ek Pranāli'*, *'Rānāde Kā Darūana'*, *'Nīti Vighraha'*, *'Rāmāyana vidyā'*, *'Ādhunika Vyāvahārika Manovigyāna'*, *'Mūla Āmkāra Vedānta'* are prominent philosophical writings of Professor Pandey. Apart from this his several serious research papers have been published in the leading journals of philosophy. Professor S.L. Pandey had missionary zeal to promote the cause of philosophy and this can be easily substantiated by this fact that he was the founder member of Akhil Bhārtīya Darūana Parisad and established Uttara Bhārat Darūana Parisad. He was the moving spirit behind the launching of journals such as *Darūanika Traimāsika*, *Review of Darūana* and *Samdarūana*. He has made an exemplary effort to combine the merits of Advaita Vedānta and socialism. Depth epistemology is a seminal concept

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प्रथम संस्करण : 2021 ई.

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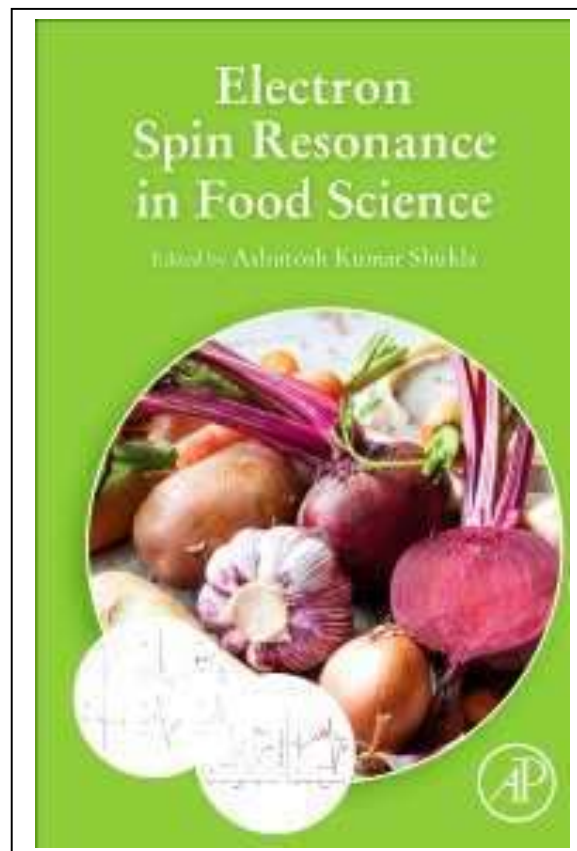
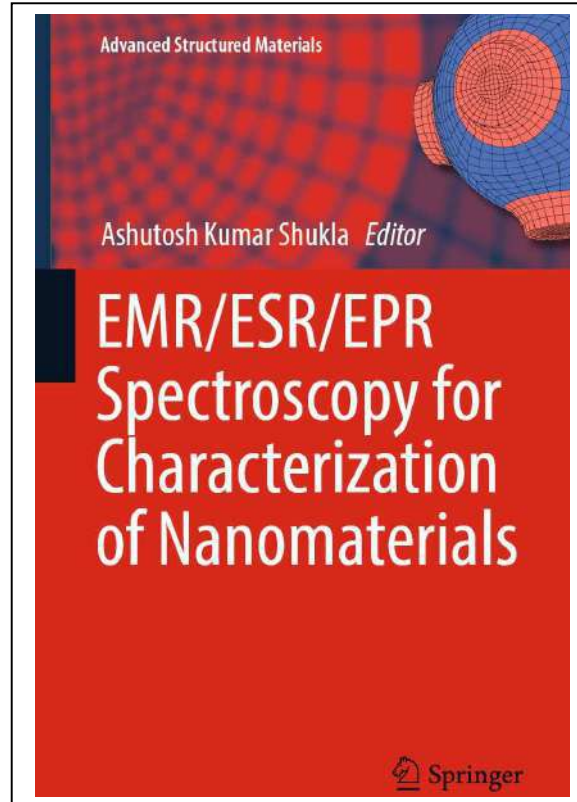
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1. Siavash Irvani and Ashutosh Kumar Shukla, Plant protein based nanoparticles and their biomedical applications in “Nanomaterials and plant Potential”, Azamal Husen and Muhammad Iqbal (Eds.), Springer(2019), pp 177-191, eBook ISBN 978-3-030-05569-1, Hardcover ISBN 978-3-030-05568-4

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1. Green Approach for the Synthesis of Magnetic Iron Nanoparticles Using Eucalyptus leaf Extract, Niti Tripathi, Ashutosh K. Shukla, Sharda S. Sanjay in Advances in Chemical and Applied Sciences, Vol 2, 2020, Ed(s) Mridula Tripathi, Santosh K. Srivastava, Roli Srivastava, ISBN 978-93-88018-17-3



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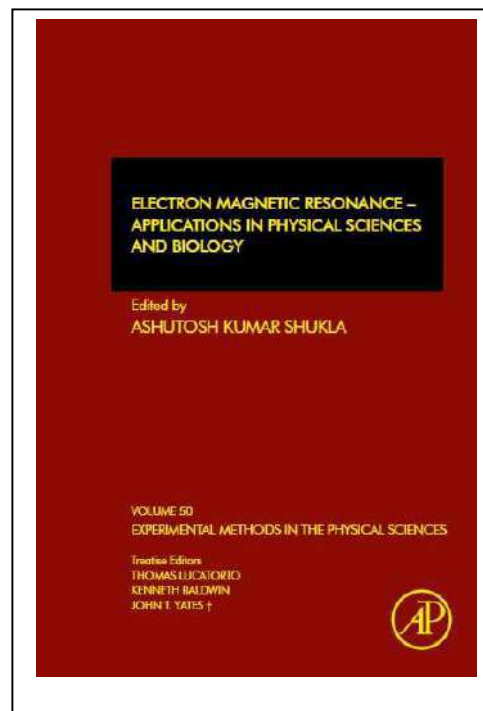
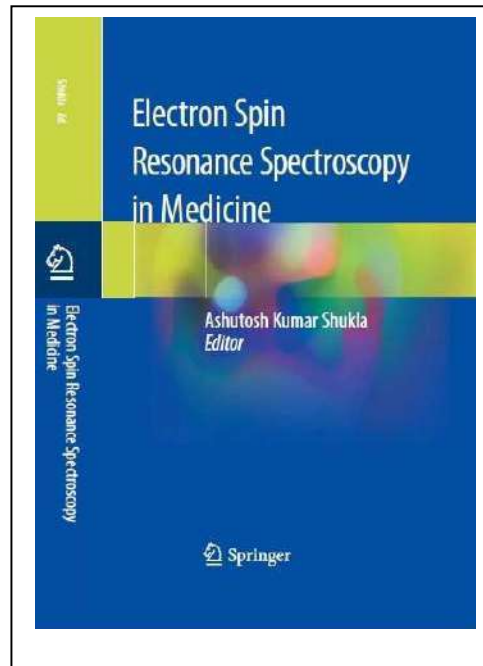
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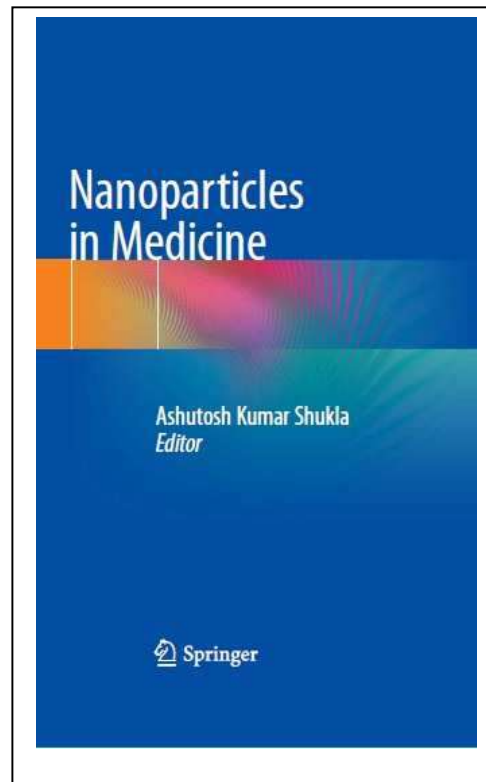
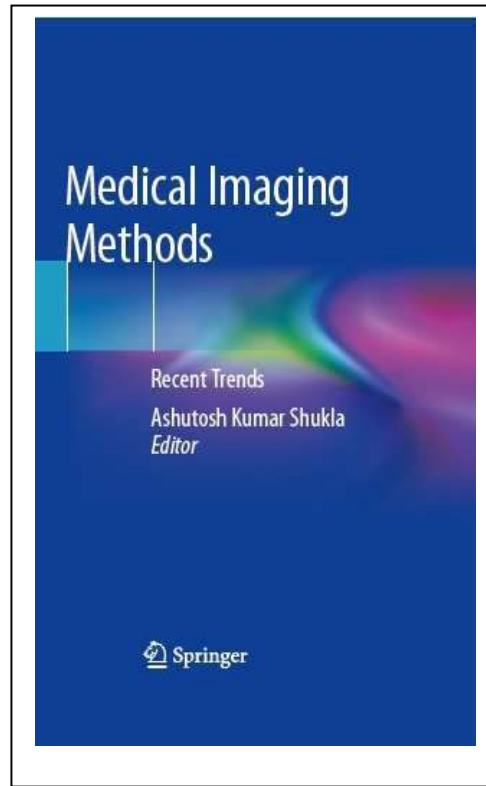


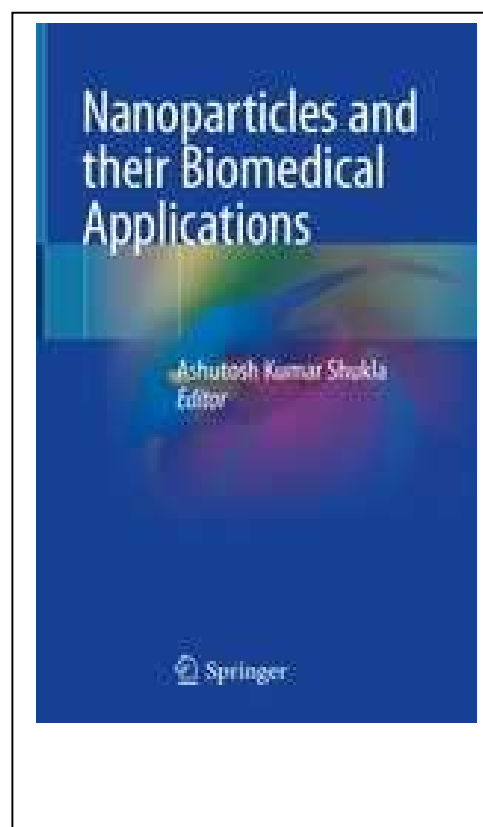
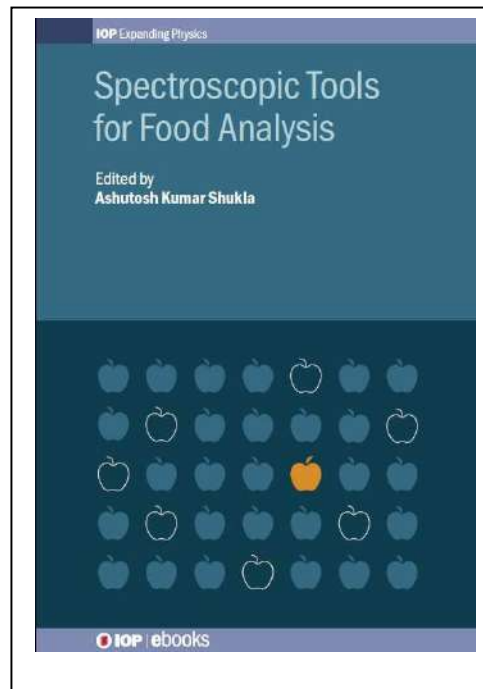
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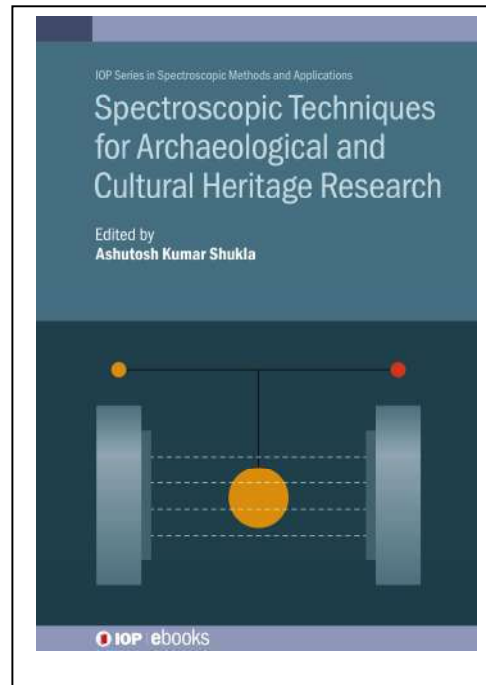
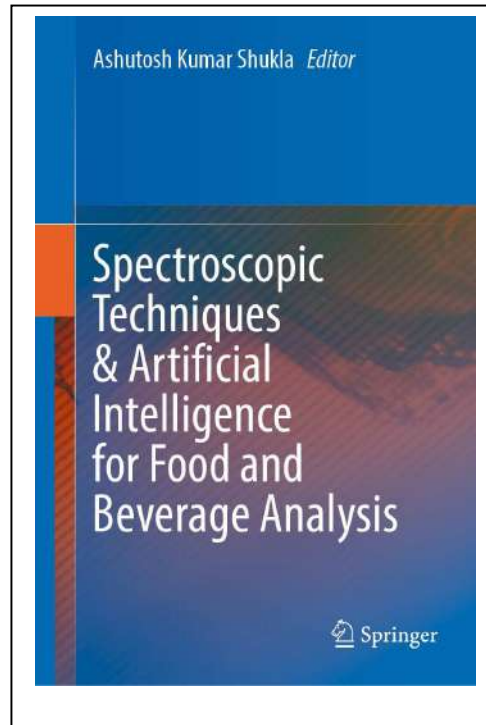
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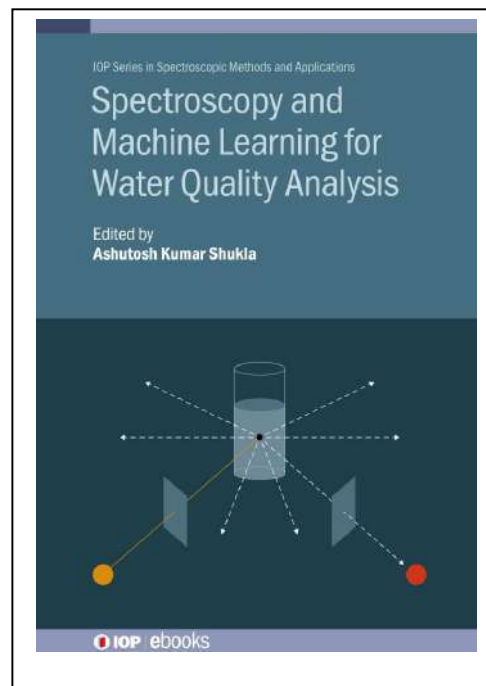
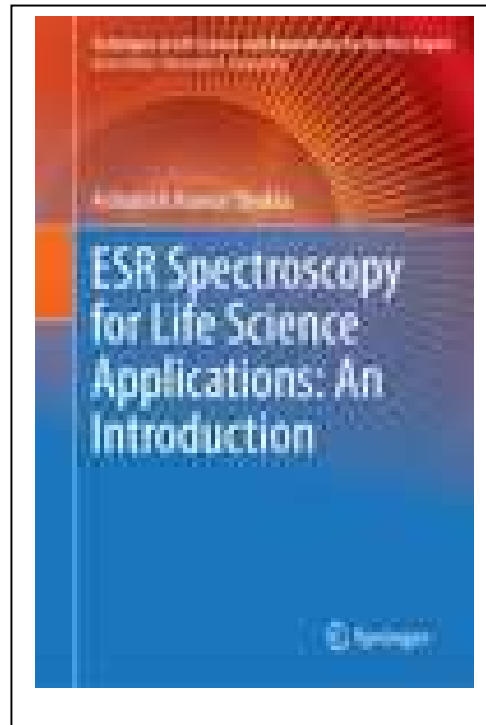
Micro & Nano Technologies Series











Chapter 6

Plant Protein-Based Nanoparticles and Their Biomedical Applications



Siavash Iravani and Ashutosh Kumar Shukla

6.1 Introduction

The plant protein-based nanoparticles (NPs), such as soy proteins, zein, and wheat gliadins, have several benefits and are widely available, compared to the animal-derived proteins. They can be used as drug carriers for lipophilic or anticancer drugs and as delivery systems for bioactive ingredients (Wan et al. 2015; Malekzad et al. 2017). These proteins can be used to encapsulate drugs in order to protect them from a rapid degradation by environmental stress. These carriers are biodegradable and metabolizable and can be prepared under soft conditions without the use of toxic and hazardous organic solvents or materials. They can incorporate a wide variety of drugs in a relatively non-specific fashion. Moreover, these NPs may offer various possibilities for surface modification and covalent attachment of drugs and ligands. Corn, wheat, and soybeans contain proteins, which are readily available, biodegradable, and considerably less allergic in contrast to animal proteins such as bovine collagen (Malekzad et al. 2017). Plant protein-based NPs can be used in drug delivery and gene delivery systems, in bioactive compound delivery, and in improvement of oral bioavailability of drugs. Moreover, they have applications in food industry and tissue engineering. Some important advantages of plant protein-based NPs have been summarized in Table 6.1.

Plant proteins are generated as coproducts when cereal grains are processed for food or fuel and have limited non-food applications. Zein, soy proteins, and wheat proteins (gluten, gliadin, and glutenin) are the major plant proteins. Peanuts, sorghum, millets, and other cereal grains also contain some lesser amounts of proteins.

S. Iravani

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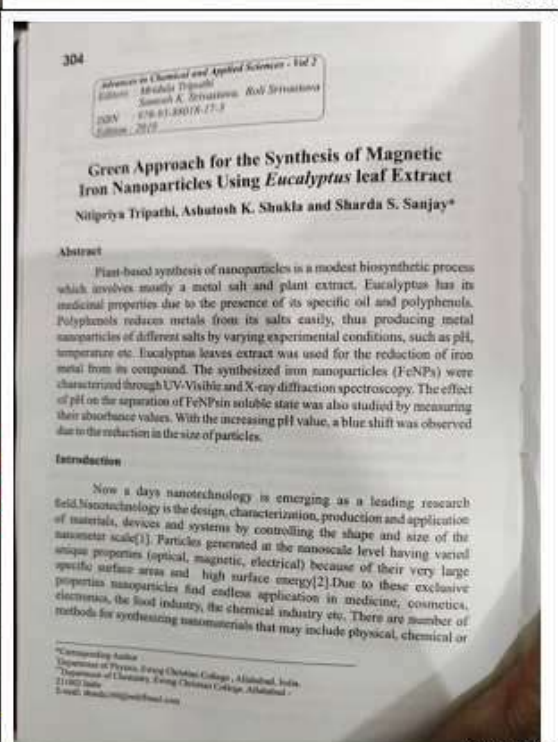
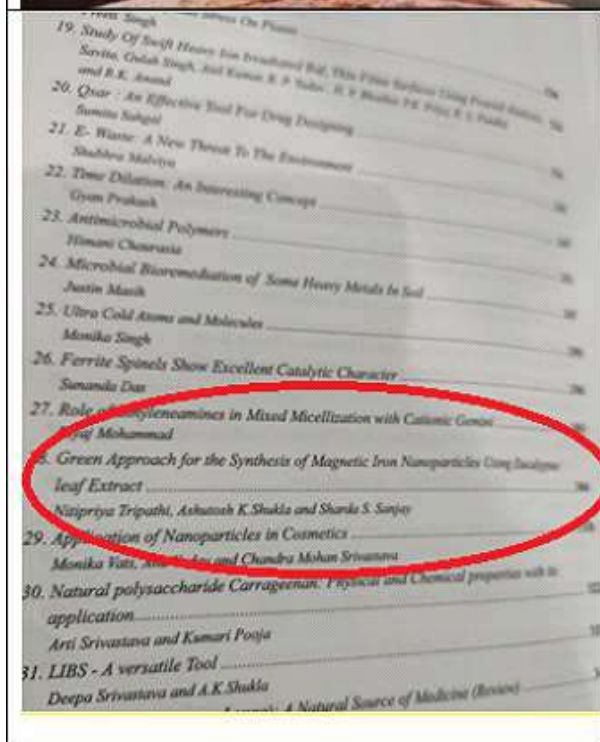
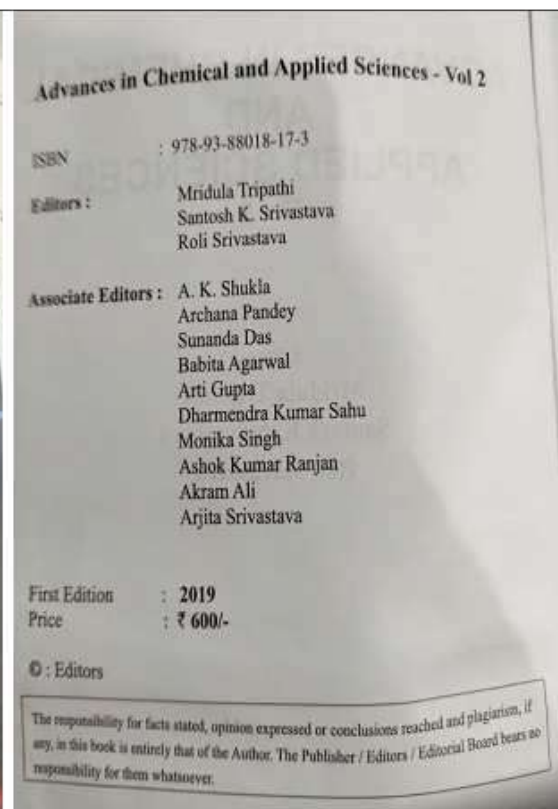
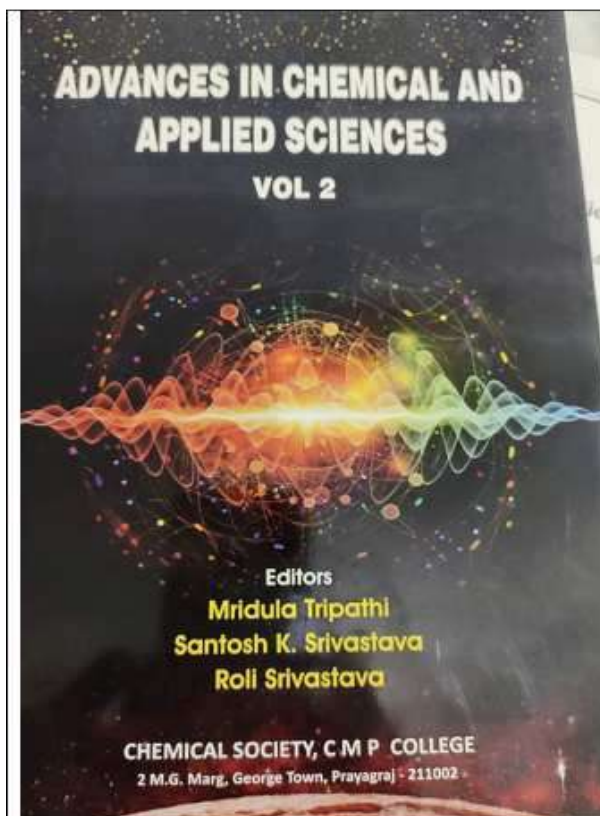
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A. Husen, M. Iqbal (eds.), *Nanomaterials and Plant Potential*,
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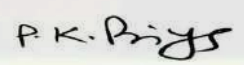
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