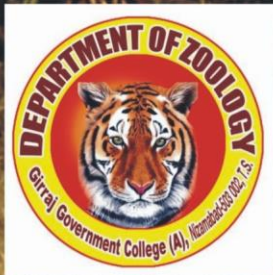


Proceeding of One Day National Seminar On MODERN APPROACHES IN ANIMAL SCIENCES AND APPLIED BIOLOGY

04-02-2016



Organized by
DEPARTMENT OF ZOOLOGY
Girraj Government College (A)
Reaccredited with "B" NAAC
Nizamabad

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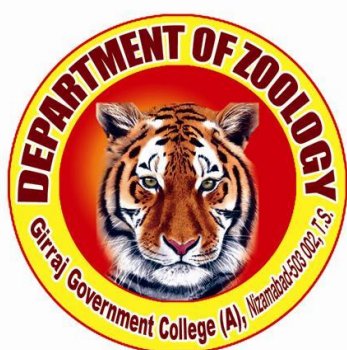


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MODERN APPROACHES IN ANIMAL SCIENCES AND APPLIED BIOLOGY

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**Sponsored by
UGC –Autonomy Grants**



Editors:

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ABOUT THE COLLEGE

Girraj Govt. College, an autonomous institution is affiliated to Telangana University. This institute is one among the government colleges of Telangana State with CPE status by UGC and NAAC Re-accredited with 'B'. The college was established in 1956 with pre university course and under graduate courses with objective of providing quality higher education to the needy students of Nizamabad and adjacent districts. Many philanthropists including Sri Girrajmal Agarwal extended their helping hand through donations to start this prestigious institution. The college was taken over by the government of A.P. in 1959. The present premises of college were constructed in 1969 on 29.6 acres of land. The college presently offers 19 UG & 7 PG courses with 3,500 students. The campus possesses equipped laboratories, Jawahar Knowledge centre, Sports & Gymnasia, National cadet corps, National social service, UG & PG Libraries, Study centres: Prof. G. Ram Reddy CDE, OU, Hyd., IGNOU, Dr. BRAOU, Hyd., Hostels for Boys & Girls that provides opportunity to pursue education in natural environment.

ABOUT THE DEPARTMENT

The Department of Zoology was established in 1956, since the inception of the college. In the beginning only one group B.Sc. (B.Z.C) was associated with the Dept., presently the students of B.Sc. Microbiology, Biochemistry opt the zoology one of the optional. So far many students confined to the subject areas brought laurels to the Dept. by elevating themselves to the national & international levels in the educational pursuits. The Dept. has offered M.Sc. zoology with specialization fisheries & aquaculture, comparative animal physiology from the academic year-2005-06. The faculty of the Dept is encouraging the M.Sc. students with update knowledge in the subject content that contribute them to enter the R&D. The Department has got linkages with National Fish Seed Farm, Animal disease diagnostic laboratory, Dist. Malaria Dept., and Govt. Medical College Nizamabad. The Dept. works in guidelines of Zoology Dept., Telangana, & Osmania University

for framing UG syllabus. An interdisciplinary elective subject-public health & hygiene is introduced in the Dept. under Choice Based Credit System.

OBJECTIVES OF THE SEMINAR

- To provide a congenial academic platform to the faculty, research scholars, and students to discuss, share and exchange of ideas, knowledge and to express difference of opinions in the newly emerging fields of biology particularly in animal sciences.
- To congregate the intellectual community of biological science at one place to know and understand recent technological advancements in undergoing research.
- To deliberate on recent achievements in Animal Science and their impact on Health care, Industry, Agriculture and Environment.

ABOUT THE SEMINAR

Animal science deals with the studying of the biology of animals that are useful and harmful to human kind. A development in animal science and applied biology due to considerable scientific efforts increases understanding the role of animals in the environment and their impact on human health care. It also solves the problem of demand of food and environmental problems due to the increased population. Recent trends in Animal Sciences and applied biology in a broad way include techniques like Animal cell culture, Transgenics, Stem cell therapy, Pharmacogenomics and Personalized medicine, Genomics, Proteomics and Metabolomics. These latest trends and technologies have a great impact in the fields of Health & Hygiene, Therapeutics, Live stock production, Agricultural Entomology, Aquaculture, Animal biodiversity and Environmental protection etc. Due to immense potential, many researchers have been taking up vigorous research in these areas of animal Science and applied biology and have come up with novel findings which are beneficial to mankind. Such emergence of new disciplines in life science enhances carrier opportunities to the rural and urban students in industries and laboratories. In view of this, the seminar is aiming to expose and educate the student of rural back ground about these naval trends and findings in these areas and to create enthusiasm among them towards the pursuing of research.

SUB THEMES OF THE SEMINAR

- Animal biodiversity & environmental issues
- Agriculture Entomology, Apiculture, Sericulture, Aquaculture, Dairy Technology, Animal husbandry & Poultry
- Insect vector control
- Parasitology
- Dietary management, Healthcare & Therapeutics
- Transgenic animals
- Human genome project
- Stem cell research
- Genomics, Proteomics & Metabolomics

PRINCIPAL MESSAGE

I felt happy for the ready acceptance and willingness to come forward and conducting one day National Seminar by the department of “Zoology” with the title “Modern Approaches in Animal Sciences and Applied Biology”.



The title selected by the organizers will bring out the contemporary advancements taking place in the field of Applied Biology across the globe which will have a direct bearing in the field of Human Health and Hygiene, Disease Diagnosis and Therapeutics. The modern Bio-technological approaches such as proteomics, DNA finger printing, 3D and Digital Radiography and other technological advancements co-related to Information Technology are playing a pivotal role in Animal and Human welfare.

These advancements still require communication to the rural society which is best possible through deliberations via student media, and cost effective therapeutics based on modern technological advancement are to be discovered for further enhancement of human healthcare.

Such seminars will provide a platform to the rural young scholars and researchers to update their knowledge on contemporary advancements and keeps them aware of global changes taking place in the field through the lectures of eminent resource persons.

This seminar may help the students to sensitize about the modern approaches in the village communities about the places of advanced technological facilities. I wish the conduct of this National Seminar will elevate the name of Department of Zoology in specific and the name of our Institution in general. I wish the organizers a great success in the conduct of National Seminar.

With best regards

Principal
Dr. V. Rajendra prasad

FOREWORD

I take to great privilege to organize a national seminar on “Modern Approaches in Animal Sciences and Applied Biology”. as in the present scenario enormous development takes place animal sciences and applied biology with the application of modern concepts and techniques includes conservation of biodiversity animal cell culture, transgenics, stem cell therapy genomics pharmacogenomics and personalized medicine, proteomics and Metabolomics, which gives great impetus in the field of livestock production agriculture and aquaculture apiculture , sericulture and dairy, poultry therapeutics and environmental protection.

Due to persistent scientific efforts in these areas increases understanding about role of animals in the environment and their impact on human health and hygiene. It also solved the problems of demand of food and environmental problems that are due to increased population. I hope the seminar should have provide a congenial academic platform to the faulty, research scholars and students to discuss share and exchange of ideas knowledge and also give awareness particularly among students of rural background and encourage them to pursue higher education and research

I express my sincere and honest graduate to our principal Dr. V. Rajendra Prasad who gave an immense support and encouragement during my task. My sincere thanks to the members of advisory committee, souvenir committee, and my colleagues and to all the persons directly or indirectly helped for successfully conducting of seminar. I also extend my thanks particularly to Dr. A. A. Haleem Khan, A. Sunil Kumar, N. Chandra Kumar and G. Srinivas Reddy for their moral support, helping hand in shaping of the souvenir

Dr. T. Venugopala Swamy
Convener & Organizing Secretary

PROGRAM SCHEDULE

04-02-2016

9:00-10:00: Registration

INAUGURAL SESSION

- Welcome Address by -**Dr. T. Venugopala Swamy, Convenor**
 - Message by Chief Patron-**Dr. V. Rajendra Prasad, Principal GGC(A)**
 - Message by Guest of honour-**Prof. R. Limbadri, Registrar, T.U.**
 - Inaugural Address by Chief Guest-Sri. **C. Parthasarathi, IAS, Hon'ble, Vice- Chancellor, T.U.**
 - Release of Souvenir
 - Felicitation of Guest
 - Vote of Thanks
-

TEA BREAK

Technical Session-I

Invited talk-I

Title: Animal models in Biotechnology research

Dr. N. Harishankar

Scientist -C, NIN

Invited Talk-II

Title: Recent Advances in Animal Sciences

Dr. J. Mahesh Kumar

Principal Scientist-CCMB

LUNCH

Technical Session-II

Invited talk-III

Title: Advances in Stem Cell Technology

Dr. Ravi Kumar Gutti

Assistant Professor, University of Hyderabad.

Invited Talk-IV

Title: Advances in Biotechnology

Dr. Y. Srinivasa Reddy

Scientist-C(proj.), NIN

Oral presentations & Poster presentation

Valedictory Session

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Advances in Biotechnology

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Since decade the paradigm shift in Biological Research has been significant. One such Pre-Historic “Science of Genetics” now known as “Biotechnology” is gaining wide acceptance especially in relation to early diagnosis of disease profile, development of therapeutic agents, vaccines, foods, improved agricultural productions etc.

Biotechnology as a powerful tool was not only predicted but became true in making remarkable changes in day to day life. In twentieth century, science and technology have provided immeasurable gains in the battle for human survival by increasing food production, improved agricultural productions, new therapeutic agents and rapid approaches in diagnosing the early disease conditions. Twentieth century Biotechnology has started bringing industry and agriculture together in 21st century biotechnology seems to be leading sudden new biology revolution and is considered as applied interdisciplinary science between biology and engineering. The completion of human genome project two years before its projected time is an indication of rapid growth in biotechnology.

It is known that population rising by 6 million every month and reaching to a total of ~9,000 million by 2050. In addition, modernization led to urbanization which affecting farming of crops or raising domestic animals. So, the impact of biotechnology on human life and economic progress of various nations all over world has given a major impetus to accelerate research development and application of this field in relevant socio-economic sectors. India holds a good advantage for development of biotechnology, due to varied diversity of flora, large population, distinct demographic area, seasonal variations.

In the world there are many GM crops like Maize, Cotton, and Soybean that are in use for the last few years. In India the success story of Bt cotton crop, has not only boosted the economy of farmer and country but given a scope to introduce new crops like Bt Brinjal, Bt Okra, Bt Rice etc., The field trial conducted with Bt Brinjal using Cry1Ac proteins is reduced 72% of fertilizers/insecticides and the yield was 116%.

However, the Bio-safety concern with reference to biodiversity and its safety for human consumption that are repeatedly questioned by public and NGO's needs to be addressed. In view of this the country's premier scientific agencies viz. ICMR, DBT, CSIR, ICAR, DST, Ministry of Health have been working collectively.

Animal Models in Biotechnology Research

N. Harishankar

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The selection an animal model for scientific study involves consideration for physiologic similarities of the model to humans with respect to the particular application being studied, relative cost, availability and husbandry aspects in laboratory. The most economical models are rodents, they are readily available and are easily propagated/managed in the laboratory animal facilities. Dogs, cats and pigs are more physiologically similar to humans than rodents, but they are expensive and their propagation and maintenance is difficult. The small animals like mice, rat, hamsters, gerbils, guinea pigs and rabbits play an important role in the understanding the mechanism involved in the control of diseases. These small animals will play a pivotal role in understanding the disease progression and helps in the development of new chemical entities and new drugs developed from recombinant technologies. Role of individual animal models role in the testing the safety and efficacy of biotechnology products.

Advances in Stem Cell Technology

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(Telangana), INDIA

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Stem Cells

Stem Cell is an undifferentiated cell of a multicellular organism which is capable of giving rise to indefinitely more cells of the same type, and from which certain other kinds of cell arise by differentiation. These are autologous cells having a long-term self-renewal ability that regenerates and differentiates into various cells, tissues, organs, and systems in the human body. Stem cell therapy is an amazing modern medical advancement that goes straight to the source of the problem and treats various disorders like muscular dystrophy, Alzheimer's disease, Atherosclerosis, Diabetes, Inflammatory Bowel Disease, Parkinson's disease, Rheumatoid Arthritis, acute lung injury and many others. Adult stem cells can

rapidly proliferate to regenerate the specialized tissues. Mesenchymal stem cell (MSC) is a type of stem cell has entered the scene as a developing therapy. Recently, mesenchymal stem cells have been found in skin, liver and other tissues. Mesenchymal stem cells are the conventional terms used to describe the collection of poorly defined multipotent mesenchymal stromal cells, which can differentiate into a variety of cell types, including osteoblast, chondroblast, myoblast and adipoblast.

History of Stem Cell Research

Stem cells have an interesting history that traces from mid of 1800 to the date, and it remains the most controversial topic of research even today.

- In 1878 attempts were made to fertilize mammalian eggs outside the body
- In 1952 Briggs and King cloned tadpoles.
- In 1954 John Enders received a Nobel Prize in Medicine for growing polio virus in human embryonic kidney cells.
- In 1959 First animals made by in-vitro fertilization (IVF).
- In 1960's that physician knew enough about HLA compatibility to perform transplants between siblings who were not identical twins.
- In 1968 the first human egg is fertilized in vitro.
- In 1968 the first bone marrow transplant (adult stem cells) was successfully used in treatment of SCID.
- In 1970s EC cells injected into mouse blastocysts make chimeric mice. Cultured cells are explored as models of embryonic development in mice.
- In 1973 a team of physicians performed the first unrelated bone marrow transplant.
- In 1978 the first IVF baby is born.
- In 1981 Mouse Embryonic stem cells are derived from the inner cell mass of blastocysts.
- In 1994 Human blastocysts are generated and the inner cell mass is maintained in culture. ES like cells form in the center and retain stem cell like morphology.
- In 1998, James Thompson (University of Wisconsin - Madison) isolated cells from the inner cell mass of early embryos, and developed the first embryonic stem cell lines.
- In 2000 Scientists derive human embryonic stem cells from the inner cell mass of blastocysts.

- In 2001 Human embryonic stem cell lines are shared and new lines are derived, more research groups are focusing attention on the differentiation of cells in vitro.
- In 2004 First human cloned blastocyst created – later proved to be fraudulent.
- In 2004 to 2005, when Hwang Woo-Suk, a Korean researcher, claimed to have produced human embryonic stem cell lines from unfertilised human eggs.
- In December 2006: ISSCR Release Guidelines for stem cell research.
- In 2008 NAS Release New Guidelines for stem cell research.
- In 2008 ISSCR Releases Guidelines for Clinical Translation.
- In 2010 Clinical Trial of Human Embryonic Stem Cell-Based Therapy was initiated. .
- In 2011 Israeli scientist Inbar Friedrich Ben-Nun led a team which produced the first stem cells from endangered species, a breakthrough that could save animals in danger of extinction.

Stem Cell Classification

Stem cells can be taken from variety of sources like bone marrow, cardiac cells, liver, skin, umbilical cord blood, muscle, peripheral blood the inner cell mass of blastocysts etc.

Umbilical cord blood contains circulating stem cells and the cellular contents of these cells are distinct as compared to bone marrow and adult peripheral blood. Cord blood stem cells are Multipotent and can differentiate into various cells. The number of umbilical cord blood hematopoietic stem cells equals or exceeds that of adult bone marrow and they are known to produce large colonies in vitro, have different growth factor requirements, have long telomeres and can be expanded in long term culture.

Several research groups are focused on the development of protective drugs for the treatment of various diseases. Most diseases have complex pathological processes and the regenerative medicine need to find the cure. Intense efforts are involved in the understanding of the concepts of regenerative processes to protect physiological functions in disease conditions and the cell based therapies are best examples.

There are three sources of stem cells: adult stem cells, embryonic/fetal stem cells and cord blood. Adult bone marrow possesses stem cells that are mesenchymal and hematopoietic in origin. Bone marrow stem cells have more plasticity and versatile because they are Multipotent and can be differentiated into many cell types both in vitro and in vivo. The bone marrow based cell therapy has some disadvantages such as it requires correcting human

leukocyte antigens (HLA) match, and collection of bone marrow stem cells is uncomfortable, painful and tedious.

Embryonic stem cells are pluripotent derived from the inner cell mass of the blastocyst. These cells proliferate indefinitely and have ability to differentiate into most adult cell types. Cell therapy derived from human embryonic stem cells would be allogeneic by nature but is unacceptable due to ethical issues.

Cord blood is the richest source of stem cells and is ethically acceptable. UCB transplants are less prone to rejection than either bone marrow or peripheral blood stem cells. This is because these cells have not yet developed the features that can be recognized and attacked by the recipient's immune system. Multipotent non-embryonic stem cells are present in umbilical cord blood. These cells give rise to cells obtained from the ectodermal, mesodermal and endodermal lineages. Along with hematopoietic stem cells cord blood contain non-hematopoietic cells that have been demonstrated by differentiation of UCB, MLPC, MSC and EPC into neuronal, cardiac, epithelial and hepatic lineages.

Is Stem Cell Therapy The Future of Regenerative Medicine?

Regenerative Medicine deals with replacement or regeneration of human cells, tissues or organs, to restore or establish the normal function. In regenerative medicine, the uses of stem cells are therapeutically valuable for the regeneration of diseased tissues and organs. Researchers suggest that adult stem cells are crucial for all physiological tissue renewal and regeneration after injury or disease. Another theory says that the bone marrow cell injected secretes cytokines that promote angiogenesis and consequently, osteogenesis is induced on the necrotic area by increasing angiogenesis, suggesting that stem cells can heal necrotic tissue. Some study suggests that MSC showed a fibroblast-like morphology and can be differentiated in vitro into osteogenic lineages. Adult human stem cells have also been isolated or identified from human kidney, breast, pancreas, mesenchyme, liver and prostate. These stem cells can be used for regeneration treatment. Researchers proved that distal airway stem cells (DASCs), a specific type of stem cells in the lungs, are involved in forming new alveoli to replace and repair damaged lung tissue, providing a firm foundation for understanding lung regeneration. Italian and Spanish scientists have provided the evidence to show that meninges, the membrane which envelops the central nervous system, is a potential source of self-renewing stem cells to treat spinal cord injuries. Several clinical trials utilizing

bone marrow derived progenitor cells to repair damaged myocardium have been completed with positive result. According to the researcher at the western university in Australia, human breast milk has the potential to treat diseases like Parkinson's and diabetes. High concentrations of stem cells are required for the tissue repair technology, such as reconstructed skin. For this purpose, stem cells can be cultured in media. Stem cell therapy holds a great promise for the repair of injured organs, including kidney. Stem cell populations with high aldehyde dehydrogenase (ALDH) enzymatic activity from cord blood and bone marrow can be used as a therapy to treat cardiovascular diseases. Adipose tissues are valuable sources of adipose stem cells which can be used as a pharmacological tool for the treatment of various degenerative diseases. Cumulative evidence demonstrates that bone marrow stem cells contribute to cardiac repair in vivo and prevent ventricular remodeling and alleviate cardiac symptoms. Stem cells have been intensively investigated as a potential source of liver stem cells and as a means to regenerate the cirrhotic liver.

Alterations in enzyme activities in the tissues of *Ctenopharyngodon idella* due to the impact of polluted Pulong canal water

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Studies on impact of polluted pulong canal water on Succinate Dehydrogenase (SDH), Lactate Dehydrogenase (LDH) and Glutamate Dehydrogenase (GDH) activities in the tissues such as gill, muscle and liver of *Ctenopharyngodon idella* were carried out. The SDH and GDH activities were found decreased in all the tissues. The depletion of SDH and GDH activities shows significantly different from the controls. Liver showed maximum SDH activity followed by gill, and muscle. LDH activity is more in gill when compared to muscle and liver.

Key Words: Succinate Dehydrogenase, Lactate Dehydrogenase, Glutamate Dehydrogenase, Gill, Muscle, Liver

Integrated Pest Management in Indian Agriculture: An Overview

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Over the next three decades, production of food grains in India has to increase at least 2 million tonnes a year to meet the food demand of the growing population (Paroda and

Kumar, 2000). In the past, agricultural production increased through area expansion and increasing use of high yielding seeds, chemical fertilizers, pesticides and irrigation water. Now, prospects of raising agricultural production through area expansion and application of existing technologies appear to be severely constrained. Land frontiers are closing down, and there is little, if any, scope to bring additional land under cultivation. Green revolution technologies have now been widely adopted, and the process of diminishing returns to additional input usage has set in. The declining trend in pesticide use in agriculture during the 1990s can be attributed to central government's fiscal policy and technological developments in pest management. During 1990s, taxes were raised on pesticides and phasing out of subsidies was initiated. Programmes on training of both the extension workers and farmers in the Integrated Pest Management (IPM) were started throughout the country. In fact, the Government of India had adopted IPM as a cardinal principle of plant protection in 1985. Notwithstanding these initiatives, adoption of IPM has not been encouraging as bio pesticides capture hardly 2 percent of the agrochemical market. This overview provides a synthesis of the papers presented at the workshop and identifies technological, socio-economic, and institutional and policy issues important in making IPM work under field conditions.

Ichthyo faunal Bio diversity in the Meghadrigedda Reservoir at Visakhapatnam, Andhra Pradesh: India

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Fish faunal bio diversity in the Meghadrigedda reservoir was studied from September-2014 to August-2015. Fish samples were collected bimonthly with help of local fishermen by using local fishing Craft and Gear. A total of 55 species of fishes were belonging to 9 orders such as Osteoglossiformes (01 species), Cypriniformes (24 species), Ciprinodontiformes (01 species), Siluriformes (13species), Angulliformes (01 species), Beloniformes (01 species), Channiformes (03 species), Mastacembaliformies (03 species) and Perciformes (08 species). The number and percentage composition of population status were calculated to 36.36% common, 29.09% abundant, 20.0% moderate, and 14.55% rare species were identified in the Meghadrigedda reservoir. During this study 42 species of fishes are least concerned (LC), 05 species were near threatened (NT), 04 are not evaluate (NE), 02 species of fish is vulnerable (VU), each 01 is endangered (ED) and data deficient (DD) were reported. IUCN (2004.2), CAMP (1998) status and Shannon-Weiner diversity (H-), Evenness (E), $H_{max} =$

$\ln(S)$ Maximum diversity possible and species richness (S) for different months were calculated.

Key words: Fish diversity, Shannon-Weiner diversity, species richness (S), $H_{\max} = \ln(S)$ Maximum diversity possible, IUCN and CAMP.

Antispermatic activity of methanolic leaf extract of *Cocculus hirsutus* in male albino rats

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Aim: To investigate the effect of Methanolic leaf extract of *cocculus hirsutus* (Menispermaceae) on the reproductive activity of male albino rats.

Methods: collect the leaves of *cocculus hirsutus* and air dried in shade after make it powder and to prepare the methanolic crude drug with soxlet technique. And maintain the albino rats three groups each group having the six albino male rats one group for control another two groups of rats were treated with 200mg/Kg body weight and 400mg/Kg body weight of Methanolic leaf extract of *cocculus hirsutus* for four weeks respectively. At the end of each experimental period, animals were killed and organ weights, sperm characteristics, histology of testis and fertility were assessed.

Results: Methanolic leaf extract of *cocculus hirsutus* did not cause any changes in body and somatic organ weight, but significantly increased the testis weight ($p < 0.05$). The sperm motility, viability and epididymal sperm count of rats treated for four weeks were significantly reduced ($p < 0.05$). sperm morphological abnormalities are increased significantly ($p < 0.05$), damaged seminiferous tubules of testis significantly in treated group rats.

Conclusion: Methanolic leaf extract of *cocculus hirsutus* has antispermatic properties.

Risk of Ebola virus transmission and assessment

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Ebola virus (EBOV) is the single member of the species *Zaire ebolavirus*, which is the type species for the genus *Ebolavirus*, family *Filoviridae*, order *Mononegavirales*. It causes a severe and often fatal hemorrhagic fever in humans and other mammals, known as Ebola virus disease (EVD) or Ebola hemorrhagic fever (EHF). As the virus spreads through the body, it damages the immune system and organs. Ultimately, it causes levels of blood-clotting cells to drop. This leads to severe, uncontrollable bleeding killing upto 90% of people

who are infected. Epidemics of Ebola virus have occurred mainly in African countries including Zaire (now the Democratic Republic of Congo), Gabon, Uganda, the Ivory Coast, and Sudan. Although EBOV is transmitted by unprotected physical contact with infected persons. It is concluded that EBOV is shed in a wide variety of bodily fluids during the acute period of illness but the risk of transmission from fomites in an isolation ward and from convalescent patients is low when currently recommended infection control guidelines for the viral hemorrhagic fevers are followed.

Ebola virus disease (EVD) is an acute viral syndrome that presents with fever and an ensuing bleeding diathesis that is marked by high mortality in human and nonhuman primates. Fatality rates are between 50% and 100%. Due to its lethal nature, this filovirus is classified as a biological class 4 pathogen. The natural reservoir of the virus is unknown. As a result, little is understood about how Ebola virus is transmitted or how it replicates in its host. Although the primary source of infection is unknown (but is believed to be bats, particularly fruit bats), the epidemiological mode of transmission is well defined. A variety of tests have proven to be specific and useful for Ebola virus identification. There is no FDA-approved antiviral treatment for EHF. Incubation ranges from 2 to 21 days. Patients who are able to mount an immune response to the virus will begin to recover in 7 to 10 days and start a period of prolonged convalescence. Supportive management of infected patients is the primary method of treatment, with particular attention to maintenance of hydration, circulatory volume, blood pressure, and the provision of supplemental oxygen. Since there is no specific treatment outside of supportive management and palliative care, containment of this potentially lethal virus is paramount. In almost all outbreaks of EHF, the fatality rate among health care workers with documented infections was higher than that of non-health care workers.

Keywords: EBOV; EVD; EHF; palliative care

HGP and recent advances in biology
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The Human Genome Project (HGP), which operated from 1990 to 2003, provided basic information about the 3 billion chemical base pair sequences that make up human DNA. It was further intended to improve the technologies needed to interpret and analyse

genomic sequences, to identify all the genes encoded in human DNA, and to address the ethical, legal, and social implications that might arise from defining the entire human genomic sequence. The HGP has not only transformed the practice of medicine, but change the course of human history forever. The HGP has had a substantial influence on the social sciences and humanities fields involved in studying contemporary science as well.

The HGP has transformed biology through its approach to deciphering a reference human genome sequence along with the complete sequences of key model organisms. The project exemplifies the power, necessity and success of large, integrated, cross-disciplinary efforts directed towards complex major objectives. In many ways this ambitious endeavour led to the development of novel technologies and analytical tools, and brought the expertise of engineers, computer scientists and mathematicians together with biologists. It established an open approach to data sharing and open-source software, thereby making the data resulting from the project accessible to all. The genome sequences of microbes, plants and animals have revolutionised many fields of science, including microbiology, virology, infectious disease and plant biology. Moreover, deeper knowledge of human sequence variation has begun to alter the practice of medicine. The Human Genome Project has inspired subsequent large-scale data acquisition initiatives such as the International HapMap Project, 1000 Genomes, and The Cancer Genome Atlas, as well as the recently announced Human Brain Project and the emerging Human Proteome Project.

Keywords: HGP; International Hap Map Project; 1000 Genomes; The Cancer Genome Atlas; Human Brain Project; Human Proteome Project

Biological control studies on *Aedes aegypti* (Diptera: Culicidae) by the parasitic nematode:
Mermithid

Mallikarjun .T, I. Suryakala

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A laboratory evaluation was carried out to determine the parasitic capacity of the nematode *Romanomermis iyengari* on III and IV instar larvae of the mosquito *Aedes aegypti*, applying a dose of 5 nematodes larva-1. The effectiveness of *R. iyengari* in larvae of *Aedes aegypti* was evaluated. *R. iyengari* efficiently parasitizes III and IV instars larvae of mosquito. The III instar larvae of the *Aedes aegypti* of mosquito were more susceptible to parasitism than the IV instar larvae. In comparison the larvae of *Aedes aegypti* were found the most susceptible to infestation by *R. iyengari* (84.9–95.8%). The larvae of *Anopheles*

stephensi were the most susceptible to infestation by *R. iyengari* (85.8–96.7%), *Ae.aegypti* (80.0-88.3%) and *Culex quinquefasciatus* (80.8-91.7%) Julio, 2004 Pochulta, Mexico. Adults from larvae parasitized during III and IV died 3-6 days after emergence. The development of the parasitic phase of the nematode normally took place during the pupal and adult stages of the mosquito.

Key words: Biological control, *Aedes aegypti*, Instars, *Romanomermis iyengari*, *Anopheles stephensi*, *Culex quinquefasciatus*

Studies on helminth parasites in freshwater fish *Wallago attu* with special reference to population dynamics

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Present study was conducted to investigate population dynamics of Helminth parasites in freshwater fish *Wallago attu* collected from Nanded, Maharashtra State during February 2011 to January, 2012. Four helminth parasites *Gangesia sp.* (Cestode), *Proteocephalus sp.* (Cestode), *Camallanus sp.* (Nematode), *Isoparorchis sp.* (Trematode) were collected from intestine, liver and stomach of the infected fish host *Wallago attu*. A total of 136 (56.66%) hosts were found to be infected from 240 fishes sampled. Forty Eight fishes were infected with *Gangesia sp.* with a prevalence rate of 20%, Thirty Four (14.16%) fishes were infected with *Proteocephalus sp.* Twenty Nine (12.08%) fishes were infected by *Camalanus sp.* while the Trematode (*Isoparorchis sp.*) infected Twenty Five (10.41%) fishes. *Gangesia sp.* and *Proteocephalus sp.* exhibited highest prevalence in the month of May, *Camalanus sp.* recorded highest in month of April while *Isoparorchis sp.* recorded peak prevalence in March. High incidence, Density and Index of infection of Helminth parasites of *Wallago attu* were reported in Summer followed by Winter whereas infection was low in monsoon. This report summarizes the data on incidence, intensity, density and index of infection of helminth parasites in fish host *Wallago attu*.

Keywords- *Camalanus sp.*, *Gangesia sp.*, Helminth parasites, *Isoparorchis sp.*, *Proteocephalus sp.*, *Wallago attu*.

Studies on hold-fast organs of Cestode parasites of certain Vertebrates

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The present study deals with hold-fast organs of Cestode parasites of certain vertebrates collected from different localities of Maharashtra State India. Hold-fast organs of Cestodes are important for attachment and adhesion. These organs of attachment are in the form of muscular suckers, rostellum, spines, hooks, tentacles etc. The work on hold-fast organs of cestode parasites of vertebrates is essential for taxonomy and histopathological research. Hence, the present study was undertaken on the role and status of diversity of holdfast organs with special reference to histopathology of Cestodes of certain vertebrates viz. Piscean and avian hosts collected from Maharashtra State, India. Cestode parasites were collected and studied from certain fishes and birds from different localities of Maharashtra.

Key Words: Hold-fast organs, Maharashtra, Piscean and Avian Cestodes, Vertebrates.

Taxonomic studies on cestode genus *Senga* (Dollfus, 1934) (Ptychobothridae, Luhe, 1902) from *Mastacembelus armatus* (Lacepede, 1800) with description of a new species”

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Present investigation deals with taxonomic studies of Pseudophyllidean cestode *Senga rostellata* sp. nov. collected from the intestine of *Mastacembelus armatus* (Lacepede, 1800) at Nanded (M.S.) India during the period of February, 2011 to January, 2013. Worm comes closer to all known species of this genus in general topography of organs but differs in having triangular scolex, narrow anteriorly and broad posteriorly, having pair of bothria, which is sessile, extends from the anterior end to posterior end of the scolex, rostellum oval to rounded in shape, armed with 20-22 hooks, neck long, mature proglottids three times broader than long, testes 25-30 in number, pre-ovarian, scattered in two groups, cirrus pouch cylindrical, vagina thin tube, runs posteriorly, ovary bilobed, Gravid proglottids are 4-5 times broader than long, uterus sacular filled with 30-35 eggs and vitellaria follicular.

Keywords: *Mastacembelus armatus* (Lacepede, 1800) Ptychobothridae Luhe, 1902, *Senga* Dollfus, 1934, Taxonomic Studies.

Analysis of water quality parameters of Alisagar Lake - A Fresh Water Reservoir of
Nizamabad District. T.S.

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The present study was carried out to assess the impacts of industrial activities on the water quality in and around the Nizamabad town. The quality was assessed in terms of hydro chemical parameters. Water samples were collected from five sites in the lake throughout the six months. Water quality parameters such as pH (8.35+0.21), EC(668+0.39 mmhos/cm), Turbidity (1 NTU) TDS (400.5+106.67 mg/l), total hardness (143+14.60 mg/l), alkalinity (180+27.58 mg/l), calcium (35+10.58 mg/l), magnesium (14+2.29 mg/l), Sodium (82+3.3 mg/l), chloride (68.5+4.81 mg/l), sulphate (48+14.63 mg/l), Silica (12+2.2 mg/l), Nitrate (14+1.5 mg/l) and fluoride (1.21+0.15 mg/l) were analyzed to know the present status of water quality. The results show that all the parameters were recorded under permissible limit (IS: 10500-2012)

Keywords: Physico – Chemical Parameters of Alisagar Reservoir Nizamabad Dist. (TS)

Dietary Management – Role in Prevention of Diabetes Mellitus

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Diabetes Mellitus is a hyperglycaemic condition which is due to decreased secretion or production of insulin from beta cells of pancreas. It leads to increased blood glucose levels in the body. It also reflects on various health effects like increasing body weight and increasing cholesterol levels in the body. Dietary management which helps in prevention of higher blood glucose levels in the body. Natural foods approach to managing diabetes, advocating “fresh is best” and avoiding artificial sweeteners, instead substituting measured amounts of fresh fruit or raw sugar. Healthy eating helps keep your blood sugar in your target range. It is a critical part of managing your diabetes, because controlling your blood sugar can prevent the complications of diabetes. Diabetes diet is simply a healthy-eating plan that will help you control your blood sugar. Here's help getting started, from meal planning to exchange lists and counting carbohydrates.

Organized by

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Economics of Eri Silkworm *Samia cynthia ricini* (Lepidoptera: saturnidae) in relation with
castor genotypes

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A study was undertaken to evaluate the cocoon parameters of eri silkworm *Samia cynthia ricini* during three seasons by feeding with the leaves of five types of high yielding castor genotypes viz. DCS-9, 48-1, DCH-519, DCH-177 along with local castor. The larval, cocoon and grainage characteristics were found to be better in normal temperature and larval development of eri silkworm during winter was prolonged than rainy and summer season. The results have shown significant variations during three seasons as cocoon weight was higher during winter season and lower during rainy and summer season, silk ratio was higher comparatively in rainy season than winter and summer season. This study reveals that of the five castor genotypes DCH-519 cultivation would be more beneficial to the castor farmer for eri culture as it yields more after local castor variety as Eri culture has been proven double beneficial and gainful employment. This study also reveals that season was associated in economics of eri silkworm.

Keywords: castor genotypes, cocoon parameters.

A study on carp fishes due to ectoparasite infection by *Argulus sps* at Kanayapally water
body, Mahbubnagar district, Telangana state.

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Argulosis caused by crustacean ectoparasites of the genus *Argulus* is one of the parasitic diseases that pose a major threat to freshwater aquaculture industry, data obtained from the survey conducted at Kanayapally fish culturing water body. This research work has been conducted to show that the carps are mainly affected with parasites like *Argulus* sp. and also reveal the prevalent and unforeseen parasitic infection in commercially available carp fishes which may credit to their marketable value. During the period of one year study, around 144 fishes have been examined; ectoparasites have been isolated from the skin and gills of carp fishes. Clinical signs in infected fish include scratching on edges of tank, stems of submerged plants, rocks, erratic swimming, and stunted growth. It causes pathological changes due to direct contact of parasite and leads to secondary infections. In the present study, it has been

noticed that crustacean parasitic infections were more dominant during pre-monsoon season but their intensity was very less compared to other seasons of the year.

Key words: *Argulus*, Ectoparasite, Clinical signs, secondary infections.

Assessment of Zooplankton Fauna of Saroornagar Lake, Hyderabad, Telangana. State
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The aquatic ecosystems of India covers vast areas and the organisms residing in it are under the influence of its water quality parameters. The occurrence and abundance of zooplankton species depends on its productivity, which in turn is influenced by abiotic factors of the lake and the level of nutrients present in the soil. The freshwater zooplankton forms an important group in aquatic ecosystems like Lakes and reservoirs and become part of food chain on which the existence of life forms dependent on it. Investigating the diversity of zooplankton forms of Saroornagar lake was studied for two years in season wise i.e premonsoon, monsoon and post monsoon. The zooplankton diversity of this lake was represented by 5 different groups viz. protozoa, rotifera, cladocera, copepoda and ostracoda. At all 4 sites around 32 zooplankton genera representing above groups were found in the Lake. Maximum species were recorded in post-monsoon season with high abundance of rotifers, while minimum were recorded in monsoon. The abundance and distribution of zooplankton species in the saroornagar lake highlighted it's enriched with high nutrients due to anthropogenic activities, sewage and prevailing of zooplankton in the lake area.

Keywords: Abundance, Zooplankton forms, Saroornagar lake,

Ichthyo fauna and Hydrophytes floral Bio diversity in the Lower Manair Dam at Karimnagar district; Telangana State: India

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Fish and Hydrophytes bio diversity in the Lower Manair Dam was studied from November-2014 to October-2015. Fish samples were collected bimonthly with help of local fishermen by using fishing Craft and Gear. A total of 66 species of fishes belonging to 9 orders such as Cypriniformes (27 species) Siluriformes (13species), Perciformes (15 species), Channiformes

(4 species) Beloniformes(2 species), Anguilliformes (2 species) Osteoglossiformes (one species) Cyprinodontiformes (One species) and Mogiliformes(one species). The number and percentage composition of population status were calculated to 32.81% common, 29.69% abundant, 21.86% moderate, and 15.63% rare species were identified in the Lower Manair Dam. Of these, 52 species of fish are least concerned (LC), 5 are data deficient (DD), 3 are near threaten (NT), 3 are not evaluate (NE), 2 species of fish were endangered (ED) and 1 species of fish is vulnerable (VU). Forty eight different species of aquatic macrophytes were recorded in 04 classes, 20 orders and 26 families, which include five free floating macrophytes, ten submerged, and thirty three emergent species of weds were recorded. The percentage composition of class, order and families were calculated during this period. IUCN (2015.4), CAMP (1998) status and Shannon-Weiner diversity (H-), Evenness (E), $H_{max} = \ln(S)$ Maximum diversity possible and species richness (S) for different months were calculated.

Key words: Fishes diversity, Macrophytes, Free floating, Submerged, Emergent, Shannon-Weiner diversity (H-), Evenness (E) and species richness (S), $H_{max} = \ln(S)$ Maximum diversity possible.

Study of the use of Mulberry and Bamboo in the sericulture sector in Telangana

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Use of silk originated in China over 2200 years B.C and came to India via Tibet around 140 B.C. Leaves of mulberry form ideal food for the silkworm larve. They spin the cocoon through glands and these forms silk. Out of about 17000 tonne of mulberry, silk produced annually in India, about 87% are produced in the South Indian state of Karnataka, Andhra Pradesh, Telangana and Tamilnadu. Over 3,30,000 farm families cultivate about 28,000 ha of mulberry to make a living by selling cocoons reared by them. Traditionally, bamboo equipment has been used in sericulture. Baskets for gathering mulberry leaves, trays for feeding leaving to larvae, mountages for production of cocoons, trays for cocoon storage, stifling baskets for steaming of cocoons and some woven mats are the main uses of bamboo in sericulture. Although all aspects of Species, Management, Agency for felling, Storage, Marketing are properly studied, documented and have subjected to research due to the importance of silk in the economics of the country. The present study is aimed to importance

of mulberry and bamboo to sustain sericulture as an industry and necessity to overcome problem in quality, quantity and sustenance of smooth supply of raw material for manufacture of equipment of silk industry.

Keywords: Sericulture, Mulberry, Bamboo, Telangana

Evaluation of the Andrographolide's role and its Indoleamine 2, 3 dioxygenase inhibitory potential and attendant molecular mechanism against STZ induced Diabetic rats
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In the present study we look into Andrographolide's role with regard to its Indoleamine 2,3 dioxygenase (IDO) inhibitory potential and its molecular mechanisms against streptozotocin (STZ) diabetic retinopathy (DR) in Wistar rats. Oxidative stress markers, kynurenine metabolites, retinal histopathological changes have been studied. Further, IDO gene expression study and docking studies have been performed. Andrographolide treated rats have been found to have decreased TBARS and protein carbonyls, kynurenine metabolites along with betterment of GSH levels and expression of IDO as revealed by morphological changes in inner and outer nuclear layers of retina. Our docking studies have provided crucial information concerning the operation of the Andrographolide in the binding pocket of IDO. Our results explains, involving IDO and Andrographolide would constitute an attempt to identify natural products with therapeutic value and further studies in this direction would be of immense significance in the management of diabetes and its associated complications.

The Inhibitory effect of Isoflavones isolated from *Caesalpinia pulcherrima* on Aldose Reductase in STZ Induced Diabetic Rats.

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Increased aldose reductase activity has been implicated in the development of retinopathy due to accumulation of intracellular sugar alcohol, i.e. sorbitol. In this study, the compounds isolated from the *Caesalpinia pulcherrima*, have been examined for its inhibitory

effects on Aldose Reductase (AR), which plays a major role in diabetic retinopathy. 3,6,7,4',5'-Pentamethoxy-5,3'-dihydroxyflavone has shown significant inhibition of rat retina AR with an IC₅₀ value of 16.24 ± 0.046 µg/ml in a non – competitive manner. Molecular docking study results are steady with the pattern of AR inhibition by compound 2 and its specificity. The supplementation of compound 2 suppresses sorbitol accumulation in retina by decreased AR activity in STZ induced diabetic rat in dose dependent manner. Besides this, rat fed with compound 2 have shown improved levels of antioxidant enzymes. This study revealed that compound 2 has pharmacologically active component with a potential to inhibit rat retina AR and affecting the delaying process of diabetic retinopathy in STZ induced diabetic rats.

Prevention and controlling of diabetic cataract in STZ induced diabetic rats by

Hemidesmus indicus

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Cataract is the opacification in eye lens and leads to 50% blindness worldwide. The aim of the study was to investigate *in vivo* antioxidant activity potential and delay oxidative stress in eye lens by *Hemidesmus indicus* (Hi) ethanol extract in STZ-induced diabetic rats due to its anti-hyperglycaemic and anti-cataract effects. Ethanolic extract of *Hemidesmus indicus* root investigated biochemical parameters were estimated and histopathological studies performed. Furthermore, plant extract was administered orally (250mg/kg and 500mg/kg body weight) then evaluate effect of extract on an enzymatic and non-enzymatic antioxidants. *Hemidesmus indicus* (Hi) significantly shown great antioxidant activity through *in vivo* studies and prevents weight loss, reduce blood glucose level and delay cataract in eyes of treated rats. Histopathological studies revealed lens of diabetic rats, but not seen in treated rats. The plant root extract also prevent oxidative stress in organs and restore antioxidant enzyme levels. The data provide evidence for the safety and potential effect of Hi in the management of experimental diabetic cataract rats.

Renewable Source of Energy – Green Alternatives

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Due to rapidly expanding population the amount of biowastes is also increasing in the environment. In metropolitan cities in India thousands tonnes of wastes are generated every day. It has threatened an alarm to the environment. In recent years various technologies are being developed to utilise the biomass and waste to generate different forms of energy so that people's energy requirement can be met and environment can be protected from the possible hazards. India has a vast supply of renewable energy resources it has one of the largest programme in the world for deploying renewable energy products and systems. The only country in the world to have an exclusive Ministry for Renewable Energy Development. The Ministry of Non-conventional Energy sources (MNES). The ministry has launched one of the world largest and most ambitious programme as renewable energy. The alternative source of energy has become very important and relevant to today's world. These sources such as the sun and wind can never be exhausted and therefore are renewable. Most of the renewable sources of energy are fairly non-polluting and considered clean through biomass. Biomass based energy has been fulfils the human need. There is a basic need to develop technologies and standardized techniques to reach to village level among the various non conventional sources of energy. Forest biomass plays a significant role in solving the fuel wood crisis. India is the biggest fuel wood producing country in the world. Many countries are promoting research and development activities in biomass energy. FAO, IDRS, UNEP, UNIDO, WHO are also engaged in bioenergy research programmes. In addition to non-fossil energy sources such as wind, hydro, waves, ocean thermal, geothermal and tidal. In Gujarat CEA at Kutch Tidal Power Project doing specific areas of the Indian Coastline that 900 MW electricity can be generated. Energy from wind can also be utilized by technological breakthrough in many states wind mills are setup for various purposes.

Key Words: - Energy sources, Biomass, MNES

Medicinal Plants used in the Treatment of Animal Diarrhoea Dietary Management,
Healthcare and therapeutics
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There may be plants growing in our garden used to care for livestock. Simple to treat when we know which plant to use. The use of medicinal plants in the treatment of diseases has generated interest in herbal preparations are increasingly used in animal healthcare systems. Diarrhoea is one of the clinical sign of gastrointestinal disorders in important livestock. 207 respondents (83.47%) used of herbs in diarrhoea management from which 57(43.18%) were scientifically identified and classified into Fabaceae, Combretaceae, Having the highest occurrence. The herbal drugs contain multiple constituents such as Alkaloids, Glycoside, Flavonoids, Tarpons, and Tannins etc. Some of the plants used by Farmers are *Acacia albida*, *Acacia sieberiana*, *Adansonia digitata*, *Adina microcephala*, *Aloe buettneri*, *Azadirachta indica*.

Physico-chemical seasonal analysis of Kothacheruvu of Vinjapally, Karimnagar Dist.,
Telangana State. (India)

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Kothacheruvu is very old and minor reservoir. It is used for irrigation as well as fish culture by fishermen society. Physico - chemical features of the water are extremely valuable in the assessment of quality of pollution status. The present piece of research work has been carried out to investigate the limnology of kotha cheruvu minor reservoir one of the greatest fresh water bodies and main source of water for various purposes specially fish culture of fishermen society . The monitoring of Kothacheruvu has been seasonally. Therefore the aim of the present study is to have knowledge of the water quality and productivity of tank of Vinjapally and to explore possibilities for better management of fish culture. In the present study various physico-chemical factors such as colour, water temperature, transparency, turbidity, conductivity, pH, Total alkalinity, Dissolved oxygen, free carbon dioxide, chloride, total hardness, nitrate, nitrite, phosphate, silicate, calcium, potassium, magnesium were found to be interrelated. These factors also indicate that the reservoir is quite suitable for fish culture and proper awareness of its culture in scientific ways should be taught to the

fisherman for its proper utilization and exploitation. The present study will be beneficial not only academically but also to improve the socio economic importance of the water body.

Key Words: Kothacheruvu, Physico-Chemical, Fish culture, Conductivity, Disolved oxygen

The role of vector control in stopping the transmission of Malaria: Threats and Opportunities

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Malaria control, and that of other insect borne diseases such as dengue, is heavily dependent on our ability to control the mosquito populations that transmit these diseases. The major push over the last decade to reduce the global burden of malaria has been driven by the distribution of pyrethroid insecticide-treated bednets and an increase in coverage of indoor residual spraying (IRS). This has reduced malaria deaths by a third. Progress towards the goal of reducing this further is threatened by lack of funding and the selection of drug and insecticide resistance. When malaria control was initially scaled up, there was little pyrethroid resistance in the major vectors, today there is no country in Africa where the vectors remain fully susceptible to pyrethroids. The first pyrethroid resistance mechanisms to be selected produced low-level resistance which had little or no operational significance. More recently, metabolically based resistance has been selected, primarily in West Africa, which in some mosquito populations produces more than 1000-fold resistance. As this spreads the effectiveness of pyrethroid-based bednets and IRS will be compromised. New public health insecticides are not readily available. The pipeline of agrochemical insecticides that can be re-purposed for public health dried up 30 years ago when the target product profile for agricultural insecticides shifted from broad spectrum, stable, contact-acting insecticides to narrow spectrum stomach poisons that could be delivered through the plant. A public-private partnership, the Innovative Vector Control Consortium, was established recently to stimulate the development of new public health pesticides. Nine potential new classes of chemistry are in the pipeline, with the intention of developing three into new insecticides. While this has been successfully achieved, it will still take 6-9 years for new insecticides to reach the market. Careful management of the resistance situation in the interim will be needed if current gains in malaria control are not to be reversed.

Key words: pyrethroid , Vector, resistance & insecticides.

Growth impact of Indian Major Carp *Catla catla* (Hamilton) in control, polluted & treated Hussainsagar Water, Hyderabad, Telangana State, India.

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Growth of *Catla catla* with three different types of waters estimation of the biochemical parameters in different parts of fish. Analysis of activity of different enzymes and heavy metals in different fish parts & fish growth in three exposures. The fishes were exposed to the Top water, Hussainsagar water and Treated Hussainsagar water for a period of two years. The polluted Hussainsagar lake water is treated based on Prof. C. Venkateswar technology (patent) formulation (Patent no. C-B-R-no.10279, serial no. 009526) converted in to portable water standards of WHO/IS which is confirmed by third party analysis of treated Hussainsagar lake water. Collection of the tissue (fish tissue) like gill, muscle, brain, liver and kidney has been dissected out and the analysis of different enzymes and biochemical parameters was estimated. The same tissue is used for bioaccumulation study. The above studies were carried out once in monsoon wise for two years and calculated the mean. The Treated Hussainsagar lake water has shown improvement in growth parameters of yield fresh and dry weights this results are co inside with the fish grown with bore well drinking water. Whereas the fish grown with untreated (Polluted) Hussainsagar lake water has shown reduction in morphological and biochemical study further accumulation of heavy metals in all the fish parts studied like muscle, brain, liver, kidney and gills.

Key words: - Hussainsagar water, Treated Hussainsagar water, *Catla catla*, Fish growth, Heavy metals

Effect of Chlorpyrifos (an organo phosphate) on biochemical constituents of fresh water Cat Fish *Heteropneustes fossilis* (Bloch)

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The present study was carried out to investigate the effect of chlorpyrifos, an organophosphate compound (OP), on biochemical constituents of fresh water cat fish *H. fossilis*. The fish were exposed to sub lethal concentration of the toxicant chlorpyrifos, and

the variations were observed in biochemical constituents in different tissues i.e. gill, liver, intestine, brain and muscle of the fish. The quantitative variations were observed in proteins, carbohydrates and ninhydrine positive substances at different time intervals i.e., 24, 48, 72 and 96 hrs. The results revealed that the components of proteins, carbohydrates and ninhydrine positive substances were found to be decreased significantly at 24, 48, 72 and 96hrs time interval of chlorpyrifos, exposure on different tissues of fish compared to control. The maximum decrease in proteins followed by ninhydrin positive substances (free amino acids) and carbohydrates was observed at 72hrs and 96hrs compared to 24hrs and 48hrs time interval in different tissues of fish *H. fossilis* on exposure to chlorpyrifos,.

Key words: *Heteropneustes fossilis*, Carbohydrates, Ninhydrin positive substances, chlorpyrifos, Proteins.

Vitamins and minerals in women (Vitamin-D)

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Vitamins and minerals are essential because they are a part of the basic nutrients. Our body cannot synthesize them; they can be achieved by balanced nutrition. They are found in the foods. Vitamins are fat soluble and water soluble, minerals are micro and macro. If vitamin and mineral excess or deficiency leads to develop some diseases or malnutrition, vitamin and mineral supplements should be taking for healing. On the other hand, healthy peoples do not need to take additional vitamin and mineral supplements.

Comparative study of physico-chemical parameters to evaluate the pollution level of pulong canal, Nizamabad, TS

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The physico-chemical parameters of water samples from four locations of pulong canal irrigation canal that surrounds the Nizamabad city were comparatively studied. The sampling locations were selected on the basis of their possibility of pollution points. The physico-chemical parameter like PH, Dissolved oxygen (DO), Total Hardness, Calcium, Magnesium, Chloride, Nitrite, Nitrate, Carbonates, Bicarbonates and Phosphates of water samples was

determined. The results were compared with standards prescribed by WHO (1973 and 2012) ISI (10500-91). The present study indicates that the location II and III were more polluted. The different parameters values in these two locations were very high compared to the other locations under study

Key words: pH, dissolved oxygen, Total hardness, Calcium, Magnesium, Chloride , Nitrite Nitrate, Carbonates , Bicarbonates, phosphate

Gluten- free diet

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Gluten is a protein composite found in wheat, barley, rye and triticale. Gluten is actually composed of two different proteins: gliadin (a prolamin protein) and glutenin (a glutelin protein). Gluten proteins have low nutritional and biological value and are not essential in diet.

Gluten causes health problems which include coeliac diseases (CD), non-coeliac gluten sensitivity (NCGS), gluten ataxia, dermatitis and wheat allergy. Coeliac disease (CD), is chronic, immune mediated mainly intestinal process. Untreated coeliac disease may cause mal absorption, iron deficiency, osteoporosis, obstetric complications, increased risk of intestinal lymphomas and with some autoimmune diseases such as diabetes mellitus type-1, gluten ataxia etc. Non-coeliac gluten sensitivity symptoms are headache, migraine, dermatitis (skin rash) depression, anxiety, and peripheral neuropathy etc... Symptoms of wheat allergy are similar like coeliac disease and non-coeliac gluten sensitivity but wheat allergy has a fast onset.

Gluten free diets are endorsed by celebrities and some world class athletes who believe that diet can improve energy and health. People buy gluten free food because they think it will help them lose weight; they seem to feel better and mistakenly believe they are sensitive to gluten. But the risks are gluten free diet can lack the vitamins, minerals and fiber which are found in wheat, barley, rye etc. Gluten free diet may be too high in fat and calories, often higher in salt, sugar, glycemic index, and transfats.

Gluten free is generally used to indicate a supposed harmless level of gluten rather than complete absence. 2008 systemic review tentatively concluded that the consumption of less than 10mg (10ppm) of gluten per day is unlikely to cause histological abnormalities.

Key words: Gluten, coeliac diseases (CD), non-coeliac gluten sensitivity (NCGS), gluten ataxia, dermatitis, wheat allergy, auto immune diseases, Intestinal lymphoma and peripheral neuropathy

Biodiversity and Climate Change

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There is widespread recognition that climate change and biodiversity are linked. Most obviously, by changing the environmental conditions within which species exist, climate change induces an adaptive response on the part of species.

It includes changes in species distributions and abundance, changes in the timing of reproduction in animals and plants, changes in animal and bird migration patterns, and changes in the frequency and severity of pest and disease outbreaks. Some of these effects are the direct result of changes in temperature, precipitation, sea level or storm surges. Others are the indirect effect of changes in, for example, the frequency of fire. In general, species are moving from lower to higher elevations and from lower to higher latitudes, although the rapidity of the response varies very considerably. In any given ecosystem, changes in the frequency and intensity of disturbances determine the rate at which plant and animal assemblages will change.

Recently the World Animal Health Organization categorized the species reported to it according to both their rate of spread and potential damage. One category, List A species, comprised transmissible diseases with the potential for very serious and rapid spread, significant damage costs and potentially major negative effects on public health. A second category, List B species, comprised transmissible diseases with slightly less significant damage costs. Analysis of the relation between the number of outbreaks within each category of disease and the value at risk indicates that whereas outbreaks of most diseases.

Finally, it is worth underlining the fact that the climate and adaptive capacity externalities of biodiversity change are a very significant part of the climate change problem. Despite the growing attention to adaptation, this has not been fully appreciated. Although it

may not currently be possible to put a reliable value on the impact of functional diversity for the adaptive capacity of the system.

Keywords :- Biodiversity, Species, Ecosystem, Transmissible diseases, Adaptation

Dairy Technology-Quality Control Management
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Food producers are responsible for the safety of their products, and to guarantee food safety of dairy products, the dairy industry has implemented hazard analysis of critical control points systems. This enables quality assurance of final products via a chain management approach. The quality and safety of raw milk is essential for the quality and safety of milk and dairy products. The quality and safety of milk is related to the contamination of milk with microorganisms, chemical residues and other contaminants.

At present India is the world leader in milk production with an annual production of 127 million tonnes. About 50 percent of the milk is handled by the organized sector. Domestic market for value added products like butter, ice cream, cheese, dairy whiteners and spreads is growing at 8-10 percent per year. Despite the large infrastructure available for processing of milk, only 27% of the total milk produced is at present converted into value added products. Consumption of large quantities of liquid milk at the site of production and poor post-harvest handling and processing are among the reasons for low value addition of milk. With the launch of the National Dairy Plan, milk production in India is likely to increase over 4 to 5 percent annually in the next two decades. The increasing demands and the accompanying value addition present a great opportunity for the dairy industry to take up the production and marketing of various dairy products especially traditional products on an industrial scale. Accordingly the demand for professionals with formal education in dairy technology would be increasing.

Quality control management has the objective of ensuring the quality and safety of the milk offered to the consumer. The nature and manipulation of the raw milk, the hygiene conditions at the farm and the industry, the process to which it is subjected and the conditions of storage change the properties of the product. Quality control of milk is done at different levels, by the farmer, by the industry and by the government. The farmer needs to have control on the raw milk in order to improve and maintain the quality of the product that is

sold to the transforming industry. The dairy industry needs to control the raw milk supplied by the farmers and sets up controls on the process and/or the end product in order to ensure the safety and quality of the product going out to the market. The government agencies control the raw milk, to obtain information of hygiene and safety, and the end product, to monitor the overall manufacturing process and to prevent fraud or mislabelling.

Keywords: Dairy Products, Contaminants, Microorganisms, Quality Control Management, Raw milk

Nutritional and Dietary Management of Food Allergy
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Management of food allergy in children involves several aspects. Complications that have been superimposed on allergy such as under nutrition, growth failure, and infection must first be treated. The diagnosis of food allergy must be established and the food allergens causing the symptoms must be elucidated. Any aggravating factor such as fatigue or emotional disturbance must be controlled. A diet test eliminating the food or foods causing the allergy in the child is given to the mother. Good management does not stop here. Some knowledge of food composition or sources of food must also be provided and the mother taught to read labels. Lists of special foods and food substitutes should be made available to her. Knowledge of where to obtain these special foods, flours, and substitutes is important. She should be taught how to substitute them skilfully and in the correct proportion when baking so that a good product is obtained. When the child's foods allergies are to major foods in his diet and are multiple, baked goods will add calories and variety to the diet. This ensures a greater degree of nutrient adequacy than provided by a limited monotonous diet of which the child soon tires. A well-planned diet and a sample menu should be provided to ensure the best possible results. Special recipes should accompany the menus so that the mother can easily provide the most varied diet possible. Finally, the diet and health of the child must be monitored often to ensure nutritional adequacy.

Human health impacts of ecosystem alteration

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Human activity is rapidly transforming most of Earth's natural systems. How this transformation is impacting human health, whose health is at greatest risk, and the magnitude of the associated disease burden are relatively new subjects within the field of environmental health. We discuss what is known about the human health implications of changes in the structure and function of natural systems and propose that these changes are affecting human health in a variety of important ways. We identify several gaps and limitations in the research that has been done to date and propose a more systematic and comprehensive approach to applied research in this field. Such efforts could lead to a more robust understanding of the human health impacts of accelerating environmental change and inform decision making in the land-use planning, environmental conservation, and public health policy realms.

A study on prevailing of communicable diseases in Nizamabad District, Telangana
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A study is carried out in the different areas of Nizamabad district, to estimate the incidence of various communicable diseases. The diseases like Typhoid, Malaria, Dengue, Tuberculosis Diarrhoea and Elephantiasis are endemic and sparsely occur in the district. Prevalence of Diabetics is more in Kamareddy followed by Nizamabad urban areas, it is also noticed that the males are more susceptible to diabetics than the females. Fluorosis occurred in Yellareddy and Bichkunda area. Diarrhoea sporadically occurred in all over the Nizamabad but incident rate is high in Banswada area. Dengue is found Navipet, Bodhan, and Sirikonda, now the dengue is under control. Incidence of Malaria is noticed more in Banswada, Armour, and Sirikonda regions. The Elephantiasis patients were found in Domchanda and Tuberculosis were found in the areas of Makloor. Typhoid is a most effective disease found in Nizamabad urban, Armour and Morthad. The above diseases are more hazardous to health and more infected by poor sanitation conditions, lack of awareness and malnutrition were also responsible for susceptibility to diseases among the populations of NZB district.

Zika Virus

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This article is about the virus. Zika virus (ZIKV) is a member of the virus family Flaviviridae and the genus Flavivirus, transmitted by daytime-active Aedes mosquitoes, such as *A. aegypti*. In humans, the virus causes a mild illness known as Zika fever, Zika, or Zika disease, which since the 1950s has been known to occur within a narrow equatorial belt from Africa to Asia. In 2014, the virus spread eastward across the Pacific Ocean to French Polynesia, then to Easter Island and in 2015 to Mexico, Central America, the Caribbean, and South America, where the Zika outbreak has reached pandemic levels. The illness it causes is similar to a mild form of dengue fever, is treated by rest, and cannot yet be prevented by drugs or vaccines. There is a possible link between Zika fever and microcephaly in newborn babies by mother-to-child transmission. In January 2016, the U.S. Centers for Disease Control and Prevention issued travel guidance on affected countries, including the use of enhanced precautions, and guidelines for pregnant women including considering postponing travel. Along with other viruses in this family, Zika virus is enveloped and icosahedral and has a non-segmented, single-stranded, positive-sense RNA genome. The virus was first isolated in April 1947 from a rhesus macaque monkey that had been placed in a cage in the Zika Forest of Uganda, near Lake Victoria, by the scientists of the Institute. The vertebrate hosts of the virus are primarily monkeys and humans. Before the current pandemic, which began in 2007, Zika virus "rarely caused recognized 'spillover' infections in humans, even in highly enzootic areas". Common symptoms of infection with the virus include mild headaches, maculopapular rash, fever, malaise, conjunctivitis, and joint pains. As of 2016, no vaccine or preventative drug is available. Symptoms can be treated with rest, fluids, and paracetamol (acetaminophen), while aspirin and other non-steroidal anti-inflammatory drugs should be used only when dengue has been ruled out to reduce the risk of bleeding.

Changes in some soil properties at incubation periods after tobacco waste applications

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In this study, changes in organic carbon based soil respiration (bsr) nitrate, nitrogen, electric conductivity and aggregate stability as of a day loam soil due to tobacco waste application were monitored for 240 days incorporating 5% tow into soil according to over dry weight basis soil samples were incubated fill capacity 20-40-80 under greenhouse condition to

applications increasing all soil properties over the control treatment soil and as values significant positive correlation each other and with the other soil properties increasing from 0.12%, 0.03 µg CO₂-C/g dry soil 24 hrs 20.7% control treatment to 1.13%, 3.7 µg dry soil 24 hrs and 54% low treatment, respectively in 20 days with the highest N 3-N 1780 ppm was found in 40 days the highest E.C. 3.35 dsm was in 240 days after 2 applications disaggregation occurred in all treatments after 20 days incubation due to probably the subtract domains of micro organisms in soil.

Zooplankton diversity and seasonal variation in Alisagar Reservoir of Nizamabad, (T.S.),
India

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Zooplanktons are microscopic organisms, act as integral components of aquatic food web and contribute significantly to productivity of freshwater ecosystems. They are performing at second trophic level in energy flow and switch over to conservation of detritus matter into edible animal food.

Alisagar reservoir is 12 kms away from the Nizamabad town and was constructed by Nizam of Hyderabad in the year 1931, which is the major drinking water source to the Nizamabad town. The studies were continued for a period of one year from March 2014 to February 2015. Zooplanktons were collected every month from four different stations of the reservoir. The quantitative analysis was done by the Sedgwick after plankton counting cell and the results were expressed as organisms per litre. The identification of Zooplankton was done with the help of standard texts and monographs. Total number of zooplanktons recorded were 1869 per litre of which rotifers were 1162 (62.17 %), cladocerans 535 (28.62 %) and copepods 172 (9.2 %). Diversity analysis have showed that total 38 species of zooplanktons have been found of which 18 species of Rotifer, 12 species of Cladocera, and 8 species of Copepoda. The study of season wise zooplankton analysis showed an average abundance of species in rainy season, lower in winter season and maximum in summer due to the different environmental and inflow characteristics of water bodies.

Key Words: Alisagar Reservoir, Zooplankton Diversity, Seasonal variation

Application of Recombinant DNA Technology in Production of Human Insulin

Organized by

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Farana Begum

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Diabetes Mellitus (Hyper Glycemia)

- Diabetes mellitus commonly referred as diabetes.
- Now-a-days INDIA is facing twin burden of under-nutrition and over-nutrition.
- Under nutrition leads to deficiencies and over-nutrition leads to obesity which further leads to” Diabetes”.
- It is due to either the pancreas not producing enough insulin or the cells of the body not responding properly to the insulin produced.

Definition

- Diabetes is a group of metabolic disease in which there are high blood sugar levels over a prolonged period.

Causes

- In sufficient production of insulin by pancreas.
- Cells of the body not responding properly to the insulin produced.
- Abnormal secretion of relaxin hormone.

Symptoms

- Frequent urination.
- Increasing thirst.
- Increasing hunger.
- Foot ulcers.
- Chronic kidney failure.
- Cardiovascular diseases.
- Damage to eyes.

Types of Diabetes

1. Type-1
2. Type-2
3. Gestational

1. TYPE-1

- ❖ Pancreas failure to produce insulin.
- ❖ ‘Insulin dependent diabetes mellitus (IDDM).

2. TYPE-2

- ❖ Cells fail to respond to insulin properly.
- ❖ Non insulin dependent diabetes mellitus(NIDDM)

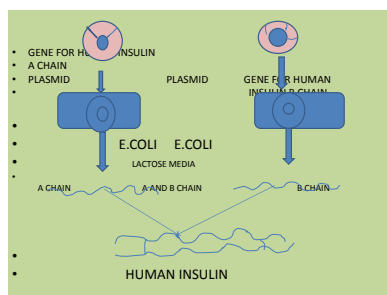
3. Gestational Diabetes

- ❖ It occurs during pregnancy.
- ❖ Abnormal secretion of relaxin hormone.

r-DNA TECHNOLOGY

- ❖ r-DNA technology started in 1970.

The basic technique consist of inserting human insulin gene and promoter gene of Lac Operon on to the plasmid of E.coli



Prevention

- ✓ Healthy diet, physical exercise.
- ✓ Maintaining normal body weight.
- ✓ Controlling B.P.
- ✓ Avoid stress.
- ✓ Eat limit prevent diabetes.

Treatment

- ✓ TYPE-1: Insulin injection.
- ✓ TYPE-2: With or without insulin.
- ✓ Medication, surgery.
- ✓ Gestational: After birth of baby

Conclusion

- ❑ As of 2014 an estimated 387 million people have diabetes worldwide with type 2 diabetes 90%.
- ❑ 1990-2013, 44% mortality rate increased.
- ❑ According to 2010 survey the first leading country is CHINA.
- ❑ India is second leading country.

- ❑ In rural area 3-6%, in urban area 12-18% peoples are suffering with diabetes.

WORLD DIABETES DAY NOVEMBER-14

Effects of Pesticides on the Growth and Reproduction of Earthworm:

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Scientific literature reveals that pesticides show a negative impact on the growth and reproduction of earthworm. Earthworms are considered as important bio indicators of chemical toxicity in the soil ecosystem. Studies on this aspect are important because earthworms are the common prey of many terrestrial vertebrate species such as birds and small mammals, and thus they play a key role in the biomagnifications process of several soil pollutants.

Both Endosulfan and Monocrotophos reduced the weight of the earthworm in laboratory conditions when applied at considerable dose, 5mg/1kg. Weight loss appears to be a valuable indicator of physiological stress, related to the degree of intoxication and time of exposure. Coiling, another symptom seen in 100% of the Malathian treated worms, is related with weight loss and is regarded as the consequence of alteration in muscular function elicited by organophosphoric pesticides which may explain the difficulties for locomotion of the intoxicated worms and their relative inability to feed themselves.

Numerous reproductive parameters such as cocoon and hatchling production have been studied in earthworms exposed to Endosulfan. Cocoon production was found to be the most sensitive parameter for this xenobiotic substance. Cocoon hatchability was most sensitive for Carbendazim. Numbers of juveniles per cocoon can be regarded as sensitive parameters to evaluate the toxicity effect of this pesticide.

Animal Biodiversity and Environmental Issues

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The variety of life on earth on biological diversity its biological diversity is commonly referred to as biodiversity. Biodiversity boosts ecosystem productivity where each species no matter how small all have an important role of play. It has long been heard that human activity is causing massive extinctions preserving species an there habitats is important for

ecosystem to self sustain themselves at the pressures to destroy habitat for logging illegal hunting and other challenger are making conservation a struggle in this human activity creating problems in nature like a climate change hand global warming first of all protect our nature for next generation.

The Effects of Selective Logging on Animal Diversity

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Selective logging is an attempt to sustainably harvest timber resources. It needs to be economically viable, allow sustainable timber production and conserve biodiversity. Much emphasis has been focused on the effects of selective logging on animal diversity. Selective logging has different effects on different animal taxa. Most studies suggest that selective logging increases the diversity and abundance of generalists or common species with wide distributions but reduces the diversity and abundance of specialists or rare species with limited distributions which require primary forest. It has less effect on animal diversity in forest where natural disturbances are frequent. Species in tropical forest are more sensitive to selective logging than temperate forest. Low-intensity selective logging has little effect on animal diversity, and is therefore more compatible with biodiversity conservation.

Stem cell

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Stem cells are undifferentiated biological cells that can differentiate into specialized cells and can divide through mitosis to produce more stem cell in mammals there are two broad types of stem cells

- 1) Bone marrow which requires extraction by harvesting that is drilling into bone the femur or iliac crest.
- 2) adipose tissue which requires extraction by liposuction
- 3) blood which requires extraction through aphaeresis where blood and passed through a machine that extracts the stem cells and returns other portions of the blood to the donor.

Ethnoveterinary medicinal plants of Euphorbiaceae

Organized by

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In 1800 B.C. King Hammurabi of Babylon rule, he devised laws on veterinary fees and laid charges for treating animals by traditional medicine in history. Ethnoveterinary medicine deals with application of folk knowledge, practice, skills, and methods of traditional healthcare of animals by farmers in fields. This practice is as old as the domestication of animals for eggs, milk, meat, and leather. This knowledge is acquired from one generation to next by traditional herb healers. This practice is inexpensive to treat the diseases and ailments of livestock. Medicinal use of plants is common since time immemorial. The potency of phytochemical constituents of medicinal plants is well known to use in modern medicine. The herb plants are commonly used in ethnoveterinary therapeutic procedures. In developing countries as per W.H.O. at least 80% of people depend on indigenous practices for control and therapy of diseases affecting human beings and their domestic animals. Euphorbiaceae family has about 300 genera and 7500 species common in tropical habitat that are monoecious herbs, shrubs, and trees, sometimes succulent and cactus-like and most of them are known to be medicinal plants. The phytochemicals reported from this family (*Croton*, *Phyllanthus*, *Euphorbia*) are alkaloids, flavonoids and terpenoids as anti-cancer, anti-hepatitis B components. In this *Acalypha* is the fourth largest genus with approximately 450-570 species. *Acalypha* species *A. alnifolia* and *A. fruticosa* are used in insecticides and sand fly repellent. Traditionally used *Acalypha* species have antimicrobial, anti-diabetic, antioxidant, anti-inflammatory, larvicidal, anti-cancer, anti-venom, anti-hyperglycemic, anti-hypertensive, *Euphorbia balsamifera* Ait. stimulates the lactation in animals. *Euphorbia hirta* and *Jatropha curcus* species are used in treatment of animal diarrhea.

Key words: Euphorbiaceae, Medicinal Plants, *Acalypha*, Ethnoveterinary

Malaria – Vaccine not yet discovered

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Malaria was discovered in 1880, a vector borne disease transmitted by bite of infected (protozoan parasite-*Plasmodium* sp.) anopheline mosquitoes. This disease is common in prevalence around the countries (tropical and subtropical) surrounding equator (Africa, Asia and Latin America). Around the globe approximately 214 million malaria cases, 438, 000

deaths were reported in 2015. There are more than 100 types of *Plasmodium* parasites that infect variety of species and five species such as *P. falciparum*, *P. ovale*, *P. vivax*, *P. malariae*, and *P. knowlesi* infect humans. The parasite completes its life cycle in two alternate hosts: Mosquito (sexual) and Man (Asexual-exoerythrocytic and erythrocytic phase). The diagnosis of malaria is through microscopic examination of blood and antigen based rapid diagnostic tests (RDT). Chloroquine (*Cinchona officinalis* bark alkaloids), Artemisinin (*Artemisia annua*) used as medication of malaria. To reduce the disease incidence, eradication of mosquitoes by mosquito nets and insect repellents are practiced. Among the insect repellents (DDT) and *pyrethroid* (flowers of pyrethrums-*Chrysanthemum* sp.) are widely used to control mosquitoes. The Nobel Prize in Physiology or Medicine to Ross (1902), Laveran (1907), and Youyou Tu (2015) were awarded but still the vaccine to prevent this disease has to come. The plant based products play important role in treatment and control of malaria vector.

Induced breeding in Indian major carps

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The practice involved in prompting the fish to breed in confined waters is known as induced breeding. Chiefly induced breeding involves hypophysation technique includes the injection of pituitary extracts of the same species or related species to the ripe gravid fishes to spawn.

The average weight of pituitary gland in *Labeo rohitha* ranges from 6.6mg in 1-2 kg fish to 18.6mg in 4-5kg fish. Pituitary gland secretes gonadotropic hormones such as Follicle stimulating hormone (FSH) and Luteinizing hormone (LH). FSH causes the growth and maturation of ovarian follicles in females and spermatogenesis in testes of males. LH promotes release of gametes from nearly ripe gonads and stimulates appearance of secondary sexual characters. These hormones are not species specific.

The steps involved in induced breeding are Collection of pituitary gland, preparation of pituitary extract, selection of breeders and dosage and injection of pituitary extract. The injected male and female breeders are introduced in to a *breeding hapa* in the ratio of 2:1 for spawning. Running water with a speed of 0.2 to 0.5m/sec has been found to be ideal for stimulating breeders to spawn. Injected breeders in the hapa after brief period of counter ship

shed ova and milt. Spawning is normally takes place after 3-6 hours. Low temperature, rain water,, cool weather influences the spawning.

Indian major carps could be induced to spawn either naturally or by hypophysation twice in the same season with an interval of two months. Fertilized eggs are transferred from *breeding hapa* to *hatching hapa*.

Key words: Induced breeding, Hypophysation, FSH, LH, Breeding hapa and Hatching hapa

Biological Control Studies on *Aedes aegypti* (Diptera: Culicidae) by the parasitic nematode:
Mermithid

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Introduction:

Biological control, in the broadest sense, is defined as the reduction of the target population by the use of predators, parasites, pathogens, competitors, or toxins from microorganisms (Woodring and Davidson 1996). Biological control aims to reduce the target population to an “acceptable” level and, at the same time, to avoid adverse effects to the ecosystems. As far as mosquito control is concerned, biological control measures should integrate the protection of humans from mosquitoes with conservation of the biodiversity, while avoiding toxicological and eco-toxicological effects. As a result, the regulatory power of the ecosystem is maintained by protecting the existing community of mosquito predators.

The use of beneficial organisms for the control of mosquitoes was first recognized in the late 19th century, when attempts were made by introducing predators such as dragon flies (Lamborn 1890). However, mass breeding and successful introduction of predators, such as hydra, flat worms, predacious insects or crustaceans, often introduces a range of problems. However, such problems did not occur, or occurred only to a limited extent, with the use of fish, such as the mosquito fish (*Gambusia affinis* and *Gambusia holbrooki*), which were successfully introduced into many countries to control mosquito larvae in the early 1900s (Bellini *et al.*, 1994; Legner 1995; Walton 2007; Chandra *et al.*, 2008). With the discovery and large scale use of synthetic insecticides in the 1940s and 1950s, biological control of mosquitoes was unfortunately no longer considered to be an important method. However, the initial euphoria that greeted the success of synthetic insecticides rapidly dissipated as resistance subsequently developed within the target populations. Moreover, despite the beneficial effects of traditional insecticides, they also often have unwanted characteristics,

such as their nonselectivity which frequently causes ecological damage. As public awareness of environmental issues increased, regulations, controlling the application of chemicals were tightened. As a result, a renaissance in the biological control of mosquitoes took precedence in the 1960s and 1970s. By 1964, Jenkins had already listed more than 1500 parasites, pathogens, and predators as potential candidates for biological control.

Today, the literature on mosquito antagonists is immense (Notestine 1971; Lacey and Lacey 1990; Legnar 1995; Medrano 1993; Quiroz-Martinez and Rodriguez – Castro 2007; Mogi 2007). One of the major advantages of biological control measures is that existing predators are conserved, which will in turn assist the control effort by preying up on newly hatched mosquito larvae after the control operation, thereby, considerably enhancing the efficacy of the current control measure. By promoting the conservation of existing population of predators, parasites or pathogens, there are two major strategies for the augmentation of the population of mosquito antagonists. Inoculation refers to the release of small numbers of predators, parasites, or pathogens into the habitat of the target organisms. The antagonists become established; they reproduce and multiply under favourable living conditions in the new habitat, resulting in a sustained suppression of the target population which can be achieved by successive generations of mosquito enemies. For instance, the inoculation of fish into newly – flooded rice fields is a very common practice in mosquito control (Bellini *et al.*, 1994; Walton 2007).

Mermithidae:

Mermithidae is a family of nematode worms that are endoparasites in arthropods. As early as 1877, mermithidae was listed as one of a sub division of the nematodea mermithidae are confusable with the horse hair worms of phylum nematomorpha that have similar life history and appearance.

“If all the matter in the universe except the nematodes were swept away, our world would still be dimly recognizable ...” N.A. Cobb (1914)

The earliest record of a mermithid nematode was of *Limnomermis aquatilis* parasitizing *Anopheles* spp. in nature, from France (Dujardin, 1845). Subsequent reports from all over the world were documented by Jenkins (1964), Roberts and Strand (1977), Roberts and Castillo (1980) and Roberts *et al.*, (1983). The first report of mosquito mermithid from India was by Ross (1906) from larvae of *Culex fatigans*. Later, Iyengar (1927) reported

Mermis sp. from Bengal, India, in *Anopheles pseudojamesi*, *A. hyrcanus*, *A. sinensis*, *A. barbirostris*, *A. fuliginosus*, *A. philippinensis* and *A. tessellatus*. Welch (1964a) described *Romanomermis iyengari* from *A. subpictus* from Bangalore, India and later this species has been re-isolated from mosquito larvae breeding in paddy fields in Pondicherry, India (Gajanana *et al.*, 1978).

The Phylum Nematoda has five orders with 14 families of obligate insect parasites, but only members of Mermithidae have been found in natural populations of mosquitoes (Poinar, 1979). The family Mermithidae is composed of more than 30 genera, of which 8 are parasites of mosquitoes and 6 of blackflies. Though a number of attempts have been made to describe mermithids from mosquitoes, only 15 described species are presently recognized. The mermithids of mosquitoes can be divided into two groups according to their maturation i.e., whether the nematodes mature primarily in larval or in adult stages of host (Platzer, 1981). In the first group there are four genera and ten species, i.e., *Hydromermis churchilliensis*, *Octomyomermis muspratti*, *Octomyomermis troglodytis*, *Romanomermis culicivorax*, *Romanomermis communensis*, *Romanomermis hermaphrodita*, *Romanomermis iyengari*, *Romanomermis kiktoreak*, *Romanomermis nielsenii* and *Strelkovimermis peterseni*, collected respectively from Manitoba, Zambia, California, Florida and Louisiana, Manitoba, Manitoba, India, Northwest Territories, Wyoming, and Louisiana. In the second group there are five species belonging to four genera. They are *Culicimermis schakhovii*, *Culicimermis* sp., *Empidomermis cozii*, *Paramermis canadensis*, and *Perutilimermis culicis* collected respectively from USSR, Manitoba, West Africa, British Columbia, Louisiana and New Jersey.

According to the taxonomic review of the *Romanomermis* spp. by Galloway and Brust (1979), the genus *Romanomermis* was first established by Coman (1961). Tsai and Grundmann (1969) established the new genus *Reesimermis*, distinct from *Romanomermis*, on the basis of distally fused spicules in the male. The *Romanomermis* sp. reported by Petersen *et al.*, (1968) from Louisiana was reidentified as *Reesimermis nielsenii* (Nickle, 1972), also transferred *R. iyengari* to the genus *Reesimermis* and revised the diagnosis of the genus based on two completely separate, though closely applied, spicules. Later, Ross and Smith (1976) synonymized *Reesimermis* with the preexisting genus *Romanomermis* and discarded the synonymy of the later with *Eurymermis*. *Romanomermis iyengari* was resurrected and the

new species *R.culicivorax* (previously identified as *Reesimermis nielsenii* from Louisiana) was described.

Objectives:

- Effect of environmental factors on host (*Aedes aegypti*) breeding and hatching.
- Effect of temperature on embryonic development, survival and infectivity of preparasites, development of parasite and its emergence, oviposition and fecundity.
- Effect of temperature and host-parasite ratio on the sex determination.
- Influence of CO₂ on the hatching of eggs.
- Effectiveness of the mermithid nematode in controlling *Aedes aegypti* mosquito larvae.

Materials and Methodology:

I. Insectaries:

- The use of environmentally controlled chambers (insectaries) dedicated to mosquito rearing is encouraged. Adults can be maintained in mesh cages located in an insectary (Christophers, 1960 for a discussion of cage construction). For general rearing, mosquitoes are maintained at 26°C, 84% relative humidity, under a 16 hr. light and 8 hr. dark cycle with 1 hr. crepuscular periods at the beginning and end of each light cycle.

II. Life Cycle:

1. The time in which a mosquito matures to adulthood is dependent upon environmental factors such as temperature, humidity, and nutrition. In the conditions described in this protocol, development proceeds roughly as follows:
2. Egg Hatch/First instar – days 1-2
3. Second instar – day 3
4. Third instar – day 4
5. Fourth instar – days 7-8 (males) or 8-9 (females)
6. Pupae – days 7-9
7. Adult – day 9 (males) or 10 (females)

III. Hatching Eggs:

8. After approximately 3 days, eggs in diapause that have been collected on egg paper can be used in scheduled rearing.

9. Fill a 500 ml plastic cup with 375 ml. distilled water. Add 5 ml. bovine liver powder suspensions. Cut a piece of egg paper containing ~300 eggs and place it in the cup. Avoid overcrowding during development as this will result in smaller mosquitoes.
10. After 1-2 days, larvae can be moved with a transfer pipette to a large (~3 L.) bowl containing ~1.5 L. water. Transfer ~150 larvae per bowl, and again avoid overcrowding. Add ~15 ml. bovine liver powder suspension to each bowl and cover with a lid. Check the liver powder levels every 1-2 days. If all larvae are feeding in one area of the bowl, it is a good indication that an additional 5 ml. of liver powder solution should be added.
11. Once larvae become pupae (there will be a mixture of larvae and pupae in the bowl), transfer the pupae from the bowl into a 500 ml. plastic cup containing 250 ml. distilled water, which will be placed into a rearing cage. For the transfer, you should:
 - I. Gather the bowl that contains pupae/larvae, two additional clean/empty bowls, two cups, distilled water, a transfer pipette, and a strainer for catching pupae/larvae. Mosquito rearing cages should be prepared ahead of time.
 - II. Pour the contents of the bowl containing pupae/larvae through a strainer into an empty bowl. The animals will remain in the strainer; the water collected in the bowl should be saved, as you will eventually need to transfer the larvae back into this water.
 - III. Rinse the animals by slightly submerging the strainer in distilled water. Shake slightly to remove liver powder. Empty the animals into a clean bowl containing distilled water.

Once all animals have been collected, 5 the cup containing pupae inside of a rearing cage and allow the pupae to become adults. To split the pupae into a few cups or cages depending on the number collected (we aim for ~125 per 20×20×30 cm cage).

13. In late afternoon the following day, collect any additional pupae that have developed and add them to the cage. Soak 3-4 cotton balls in 5% sucrose solution, squeeze them together slightly to make one ball, and place it in the mosquito rearing cage.

14. For blood feeding, animals should be placed on of the top of the netted cage for ~15 min. Adult female mosquitoes should be aged ~3 days and should be deprived of sucrose solution ~12-24 hr prior to blood feeding.

IV. Egg Collection:

Collection of eggs for basic colony maintenance:

15. Egg collections can be made ~3 days following blood feeding, at which time each adult female will lay ~100-150 eggs. The following procedure will allow for collection of eggs that will be used for maintenance of the culture. The procedure differs slightly for timed collections or when collecting eggs for microinjection.
16. Cut a piece of paper towel (~9 cm × 20 cm). Label it with the strain type, date, and time.
17. Get a 500 ml plastic cup and add ~250 ml distilled water. Place the paper towel in direct contact with the inner wall of the cup (make sure writing faces cup wall) and along the water/air interface. Place the cup in a cage.
18. Allow the mosquitoes to lay eggs for ~3 days (a more narrow window can be used if staged collections are desired). After this, collect the paper towel hereafter referred to as egg paper. Mosquitoes will typically lay the majority of their eggs within one day of egg paper placement. Keep the egg paper in the cup for an additional 24 hrs, and then remove it for drying.
19. Cover the egg paper and allow it to dry for ~3 days in the insectary. Once dry, wrap it with a piece of folded paper towel and place it in a plastic container, where it can then be stored for up to 3 months. During this extended desiccation period, development will arrest at the first larval stage. When eggs from such collections are placed in water, animals will hatch as first instar larvae over the next few hours.

Effect of temperature on different stages:

In the present investigation specified, the different stage of *R. iyengari* and the host larvae (second instar *Aedes aegypti*) used for various experiments were done in the laboratory (Method obtained from Vector Control Research Centre, Pondicherry).

Embryonic development: Gravid females (500) of *R. iyengari* were placed in 100ml. chlorine-free tap water in a beaker for egg-laying. After 4 h., the nematodes were removed and the egg suspension was diluted so as to get 25 eggs/ml. 10 ml. of this suspension (250 eggs) was transferred to a cavity block (5cm dia x 1cm ht.). 16 such cavity blocks were covered with glass plates and 4 each were incubated at 20, 25, 30 and 35⁰C in BOD incubators. The embryonic development was monitored at 12 h. interval for 30 days under

microscope. Because of poor rate of hatching of matured eggs at 20 and 25⁰C, the concerned cavity blocks were transferred to 30±2⁰C on 30th day and the observations were continued.

Effectiveness of the mermithid nematode in controlling *Aedes aegypti* mosquito larvae:

Water from different artificial containers were brought to the laboratory and pooled. *Aedes aegypti* II instar larvae collected from the artificial containers were used as hosts. The larvae (in groups of 100) were exposed to the ppm of *R. iyengari* at 1:1, 1:2, 1:3, 1:4 and 1:5 HPR in 100 ml. of the artificial containers water for 24 h. The percentage parasitism and number of parasites per host larva were determined by dissecting and examining then under microscope.

The density of the immature of *Aedes aegypti* in the artificial containers was determined by siphoning out the water from each artificial containers with a bottle (5 lit.) having a tight fitting top and 2 pieces of plastic tubing inserted through it (Service, 1976). One length of tubing was placed in the water while the other was sucked to start the water siphoning out. The entire water containing the immature was drawn out into the bottle held below the artificial containers. This was transferred to enamel trays and the total number of larvae and pupae were counted and recorded. Larvae (100) from each artificial container were examined to rule out the presence of natural nematode infections and then the entire water along with the immature was returned to the artificial containers

The ppm were then applied to artificial containers using Pasteur pipettes at the HPR of 1:4 (which was predetermined as the optimal dosage). Another set of artificial containers were left untreated as control. The numbers of immature present in the artificial containers were assessed on different days after the treatment until 99th day, when the artificial containers dried up. On every such occasion a maximum of 25 numbers of different larval stages were examined for nematode infection. From this data, the mean number of immature and percentage parasitism were calculated.

Results:

The maturation of embryos into late coil stages/matured eggs and initiation and completion of egg hatching were faster at higher than at lower temperatures. The time taken for 50 percent of the embryos to become matured eggs ranged from 3.9 days at 35⁰C to 8.1 days at 20⁰C. Initiation of egg hatching was faster by 11 days at former than at the latter temperatures. So also, completion of 100 percent hatching has occurred within 7-9 days of

egg-laying at 35 and 30⁰C respectively, while 85-96 percent of the eggs did not hatch even by 30th day at 25 and 30⁰C. And transfer of the unhatched eggs to 32⁰C has resulted in 100 and 40 percent hatching.

Death of the ppm was more and faster at higher than at lower temperature. While the maximum decrease in their survival was 78 percent during 0-12 h. period at 35⁰C, it was 27 percent during 122-144 h. period at 20⁰C. The infectivity of the ppn was less and lost faster at higher than at lower temperatures. The maximum decrease was 47 percent during 0-24 h. period at 35⁰C while it was 23 percent during 72-96 h. period at 20⁰C. Probit regression analysis of the data showed 50 percent survival duration (LT-50) of 10.59 and 105.77 h. and infectivity duration of 30.29 and 69.73 h. at 35 and 20⁰C, respectively.

The mean percentage infection and the mean parasite burden of the host larvae reared at different temperature were 87.75-90. 24 percent and 1.99-2.46 respectively at 20-35⁰C. ANOVA test showed no significant difference in the percentage parasitism and parasite burden ($P > 0.05$). The production of females was significantly higher at 20⁰C than at other temperature (C.D=0.10 at $P=0.05$). The mean length of the post parasites was longer at lower than at higher temperature, i.e., 11.6-18.8 mm. at 20⁰C and 9.5-13.3 mm. at 35⁰C. Significant difference was noticed in the length of female post parasites between 20⁰ and 25⁰ C and 30⁰ and 35⁰ C (C.D = 0.42 at $P=0.05$). The length of male post parasites was significantly greater at 20⁰ C than at all other temperatures (C.D = 1.00 at $P=0.05$

The commencement of post parasite emergence after infection was earlier and it was completed faster at higher than at lower temperatures. It commenced on the 3rd day at 35⁰ C and 10th day at 20⁰ C and was completed within 24 and 84 h., respectively. The median day of completion of parasitic phase (day in which 50 percent of the nematode completed the parasitic phase) was 3.35 at 35⁰ C and 10.71 at 20⁰C. Maximum number of post parasites emerged during 0-12 h. i.e., 71.32 percent and 40.84 percent at 35 and 20⁰ C respectively, and the male to female ratio were 1:3.7 during 12-24 h. period and 1:6.2 during 72-84 h. period the proportion of females was less than 50 percent only during 0-12 h. period at all the temperatures. Moulting of post parasitic juveniles into adults has started earlier at higher than at lower temperatures i.e., on 6th and 9th days, respectively, at 35 and 20⁰ C and it was completed within 5 days. Similarly, oviposition has started earlier at higher than at lower temperatures i.e., on 8th and 19th days at 35 and 20⁰ C. respectively. And it was completed

within 48 and 40 days. More number of eggs were laid during 4-8th days after the commencement of oviposition at 35 and 20⁰ C (160 and 180 eggs/ml. respectively), 8-12th days at 25⁰ C (226/ml.) and 12-16th days at 30° (186/ml.). The median day of oviposition (day by which 50 percent of the eggs are laid) was 10.34, 12.61 and 10.39 respectively, at 35, 25 and 20⁰ C. At 30⁰ C, the curve was more or less straight with a median of 20.28 day.

Conclusion:

The parasitic nematode (*R. iyengari*) infection on *Ae. aegypti* larvae was maximum 13 the day 22nd day occurrence of infection is prolonged period. The nematode infection reappeared at 30 the day indicating that nematode gets established in the habitat. Observations of infection in the laboratory condition (artificial containers). It is evidence of laboratory trials of *R. iyangari* can be used effectively as a biological control agent in normal, rain and polluted water situation as is the case highly host growing sites. High ability of *R. iyangari* causes infection to *aedes* mosquito. I observed that this nematode: Mermithede control more effectively mosquito larvae more than >80% infectious larvae appeared in the artificial containers.

Therefore factors responsible for the effect on infection of host larvae by *R. iyengari*

Temperature: All the single stage eggs of *R. iyengari* have developed into matured eggs within 6.5, 5.0 and 4.5 days respectively at 25, 30 and 35°C but, at 20 °C, it took 9.5 days the mature eggs started hatching within 12.0, 7.5, 3.0 and 1 day respectively, at 20, 25, 30 and 35 °C the survival as well as infectivity of preparasites decreased as time passed after hatching. Their 50% survival duration at 20, 25, 30 and 35 °C were 105.77, 56.13, 48.12 and 10.59 h. The duration of the parasitic phase in the host larva increased with decrease in temperature. The time taken for completion of parasitic phase by 50% of the parasite was 3.35, 4.80, 7.42 and 10.71h respectively at 35, 30, 25, and 20 °C. Majority of the post parasitic which emerged during the first 12 h. period was males irrespective of the temperature. The transformation of post parasitic juveniles to adults was faster at 35 °C and slower at 20 °C than at 25 and 30 °C. The maximum time taken for juveniles to become adults was 14 days at 20 °C and the minimum was 9 days at 35 °C. The commencement of oviposition of was earlier at higher temperature than at lower temperature. The fecundity adversely affected at 20 °C and 35 °C.

HPR: At 25 °C and 30 °C the HPR (Host Parasitic Ratio) of 1:3 resulted in 86 to 96 % infection. At 20 and 35 °C a higher HPR 1:8 and 1:4 respectively, was required to get this level of infection. More number post parasites per mosquito larva emerged at 20 and 25 °C than at 30 and 35 °C at all the HPRs except in the case of 1:1 and 1:2 also; more number of females was produced at lower than at higher HPR and temperature.

CO₂: When the eggs of *R. iyengari* were treated with CO₂ (18 to 556 ppm), enhanced rate of egg hatching to 73 to 98 % was noticed compared with only 11.5 % in the untreated once indicating that CO₂ is one of factor that influences hatching of *R. iyengari* eggs.

In the present investigation, when the *Ae. aegypti* II instar larvae exposed to the preparasite of *R. iyengari* the infection was 79 percent occurred. Whereas, the infection was 42 percent when the larvae exposed to IV instar. So larvae infected to II instar did not emerge into adult. However, 2-45 % of *Ae. aegypti* (Culicines) infected at IV instar emerged into adults and also carried nematodes. The duration of the parasitic phase nematode was same 5-7 days in the present host species.

Dietary Management – Role in Prevention of Diabetes Mellitus

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Introduction:

Diabetes Mellitus is a hyperglycaemic condition which is due to decreased secretion or production of insulin from beta cells of pancreas. It leads to increases blood glucose levels in the body. It also reflects on various health effects like increasing body weight and increasing cholesterol levels in the body. A diabetes diet — medically known as medical nutrition therapy (MNT) for diabetes — simply translates into eating a variety of nutritious foods in moderate amounts and sticking to regular mealtimes.

Rather than a restrictive diet, a diabetes diet or MNT is a healthy-eating plan that's naturally rich in nutrients and low in fat and calories, with an emphasis on fruits, vegetables and whole grains. In fact, a diabetes diet is the best eating plan for most everyone.

If you have diabetes or prediabetes, your doctor will likely recommend that you see a dietitian to guide you on dietary changes and MNT that can help you control your blood sugar (glucose) level and manage your weight.

When you eat excess calories and fat, your body responds by creating an undesirable rise in blood glucose. If blood glucose isn't kept in check, it can lead to serious problems, such as a dangerously high blood glucose level (hyperglycemia) and chronic complications, such as nerve, kidney and heart damage.

Making healthy food choices and tracking your eating habits can help you manage your blood glucose level and keep it within a safe range.

For most people with diabetes, weight loss also can make it easier to control blood glucose and offers a host of other health benefits. If you need to lose weight, MNT provides a well-organized, nutritious way to reach your goal safely.

Recommended foods:

Make your calories count with these nutritious foods:

- **Healthy carbohydrates.** During digestion, sugars (simple carbohydrates) and starches (complex carbohydrates) break down into blood glucose. Focus on the healthiest carbohydrates, such as fruits, vegetables, whole grains, legumes (beans, peas and lentils) and low-fat dairy products.
- **Fiber-rich foods.** Dietary fiber includes all parts of plant foods that your body can't digest or absorb. Fiber can decrease the risk of heart disease and help control blood sugar levels. Foods high in fiber include vegetables, fruits, nuts, legumes (beans, peas and lentils), whole-wheat flour and wheat bran.
- **Heart-healthy fish.** Eat heart-healthy fish at least twice a week. Fish can be a good alternative to high-fat meats. For example, cod, tuna and halibut have less total fat, saturated fat and cholesterol than do meat and poultry. Fish such as salmon, mackerel, tuna, sardines and bluefish are rich in omega-3 fatty acids, which promote heart health by lowering blood fats called triglycerides. However, avoid fried fish and fish with high levels of mercury, such as tilefish, swordfish and king mackerel.
- **'Good' fats.** Foods containing monounsaturated and polyunsaturated fats — such as avocados, almonds, pecans, walnuts, olives, and canola, olive and peanut oils — can help lower your cholesterol levels. Eat them sparingly, however, as all fats are high in calories.

- Diabetes increases your risk of heart disease and stroke by accelerating the development of clogged and hardened arteries. Foods containing the following can work against your goal of a heart-healthy diet.
- Saturated fats. High-fat dairy products and animal proteins such as beef, hot dogs, sausage and bacon contain saturated fats. Get no more than 7 percent of your daily calories from saturated fat.
- Trans fats. These types of fats are found in processed snacks, baked goods, shortening and stick margarines and should be avoided completely.
- Cholesterol. Sources of cholesterol include high-fat dairy products and high-fat animal proteins, egg yolks, shellfish, liver, and other organ meats. Aim for no more than 300 milligrams (mg) of cholesterol a day.
- Sodium. Aim for less than 2,300 mg of sodium a day.

There are a few different approaches to creating a diabetes diet that keeps your blood glucose level within a normal range. With a dietitian's help, you may find one or a combination of methods that works for you.

- Counting carbohydrates. Because carbohydrates break down into glucose, they have the greatest impact on your blood glucose level. It's important to make sure your timing and amount of carbohydrates are the same each day, especially if you take diabetes medications or insulin. Otherwise, your blood glucose level may fluctuate more.
- A dietitian can teach you how to measure food portions and become an educated reader of food labels, paying special attention to serving size and carbohydrate content. If you're taking insulin, he or she can teach you how to count the amount of carbohydrates in each meal or snack and adjust your insulin dose accordingly.
- The food lists system. A dietitian may recommend using food lists to help you plan meals and snacks. The food lists are organized by categories, such as carbohydrates, protein sources and fats.
- One serving in a category is called a "choice." A food choice has about the same amount of carbohydrates, protein, fat and calories — and the same effect on your blood glucose — as a serving of every other food in that same category. So, for

example, you could choose to eat half of a large ear of corn or 1/3 cup of cooked pasta for one starch choice.

- Glycemic index. Some people who have diabetes use the glycemic index to select foods, especially carbohydrates. Foods with a high glycemic index are associated with greater increases in blood sugar than are foods with a low glycemic index. Complex carbohydrates that are high in fiber — such as whole-grain rice, bread or cereals — have a lower glycemic index than do simple carbohydrates — white bread or white rice, for example — and usually are preferred to highly processed foods. But low-index foods aren't necessarily always healthier, as foods that are high in fat tend to have lower glycemic index values than do some healthier options.
- Your daily meal plan should take into account your size as well as your physical activity level. The following menu is tailored for someone who needs 1,200 to 1,600 calories a day.
- Breakfast. Whole-wheat pancakes or waffles, one piece of fruit or 3/4 cup of berries, 6 ounces of non-fat vanilla yogurt.
- Lunch. Cheese and veggie pita, medium apple with 2 tablespoons of almond butter.
- Dinner. Beef stroganoff; 1/2 cup carrots; side salad with 1 1/2 cups spinach, 1/2 of a tomato, 1/4 cup chopped bell pepper, 2 teaspoons olive oil, 1 1/2 teaspoons red wine vinegar.
- Snacks. Two unsalted rice cakes topped with 1 ounce of light spreadable cheese or one orange with 1/2 cup 1 percent low-fat cottage cheese.

Exercise — Exercising regularly can help to lose weight and keep it off. The recommended amount of exercise is 30 minutes per day most days of the week. People who take insulin or oral medications that lower blood sugar levels should check their blood glucose level before and after exercising. If exercise is vigorous and prolonged (more than 30 minutes), check the blood glucose every 15 minutes (if the exercise regimen is new and will be used again). Frequent monitoring can help to get a sense of what effect exercise has on the blood glucose level.

Conclusion:

If you have diabetes, your body cannot make or properly use insulin. This leads to high blood glucose, or blood sugar, levels. Healthy eating helps keep your blood sugar in your target

range. It is a critical part of managing your diabetes, because controlling your blood sugar can prevent the complications of diabetes.

A registered dietitian can help make an eating plan just for you. It should take into account your weight, medicines, lifestyle, and other health problems you have.

Healthy diabetic eating includes

- Limiting foods that are high in sugar
- Eating smaller portions, spread out over the day
- Being careful about when and how many carbohydrates you eat
- Eating a variety of whole-grain foods, fruits and vegetables every day
- Eating less fat
- Limiting your use of alcohol
- Using less salt

Economics of Eri Silkworm *Samia cynthia ricini* (Lepidoptera: saturnidae) in relation with
castor genotypes

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Introduction:

Telangana is located in the Deccan plateau holds immense potential for the development of eri culture. Castor plants grow as shrubs or small trees in tropical and temperate regions. It is an important crop of dry lands in semi arid zones and small farmers and tribal people in this area can generate additional income by switching to Eri culture as a subsidiary crop along with castor cultivation. Castor is grown predominantly in drought prone districts like Mahbubnagar, Nalgonda, Rangareddy, and Medak as a rain fed crop. Eri culture has an important role in poverty alleviation and empowerment of woman. Besides vast demand of its good blending and dyeing properties needed impetus is laid on to introduce eri culture in the state in a big way. (Jayaprakash *et al.*, 2003; Saratchandra, 2003; and Rama Rao *et.al.* 2005). Since 30% of the foliage from castor plant was used for rearing of eri silkworms without affecting the main seed production (Nagalakshamma, 1987).

More than 11.65 lakh hectares of land in India is covered under castor plantation in different states Gujarat, Telangana, Andhra Pradesh, Karnataka, Madhya Pradesh, Tamilnadu, Orissa, and Maharashtra. Telangana is leading in the area under castor

cultivation next to Gujarat. There are several varieties of castor available in India and abroad. Hence there is a need for identification of suitable castor varieties that meet the agro climatic needs and yield better for successful rearing of eri silkworms, to establish eri culture industry in the state. There are many reports available on the rearing performance of eri silkworm on various food plants under North Eastern conditions of the country (Saratchandra and Joshi, 1985; Biswas and Das, 2001; Hazarika *et al.*, 2003). Such studies under other agro climatic conditions of the country are scanty (Dayashankar, 1982; Reddy *et.al.*, 1989). In the present study, an attempt has been made to evaluate the cocoon parameters of eri silkworm during rainy, winter and summer season in relation to its food plant, castor genotypes.

Methodology:

Seeds of four castor genotypes along with local castor variety are collected from Directorate of Oil seed Research, Hyderabad and plants are raised in the prepared plot at Sarojini Naidu Vanita Maha Vidyalya at Hyderabad during May 2009. The geographical location of Hyderabad is 17.366 °N Latitude and 78.476 °E Longitude. The leaves collected during 3rd month after plantation removed petiole and fed the caterpillars for two years. Ten DFLs (disease free layings) were collected from RERC (Regional Eri Research Centre) Shadnagar and the eggs were kept for hatching at room temperature. Brushing process was taken up to separate the neonate worms from egg shells and reared them in trays provided with different castor genotypes including the local variety. Three replications were maintained with fifty larvae for each genotype conducted for three seasons. Tray rearing method was followed, three feedings were given per day and bed cleaning was done once in the morning for chawki worms. Special wooden trays with paraffin wax and wet gunny bags were used to maintain chawki worms. Optimum temperature of $28 \pm 2^{\circ}\text{C}$ and 80-90% humidity conditions were maintained constantly during rearing period. Three to four feedings were given to the late age worm's two bed cleanings were given and ten worms were selected randomly for each assessment at every stage. Tender castor leaves were used to feed the worms in the early stages which were very much palatable to the worms and regular spacing was maintained during entire development as it is very important for healthy, disease free growth. The larval stages were paid more attention as they were important stages of their lifecycle. Ripened worms were collected and placed on bamboo mountages for cocooning and cocoons were collected after six to ten days depending on the season and twenty cocoons

were randomly selected for each assessment. There was marked variation in all the parameters and significant difference was observed among all the genotypes.

The findings of this study cocoon parameters of eri silkworm are presented here under. The data was analysed statistically for test of significance using two way ANOVA by Fishers method. The level of significance of F test was tested at 5 percent and significant difference was observed among the genotypes.

The cocoon parameters of eri silkworm fed with five genotypes in three seasons and interaction with season and genotype recorded were as shown in the following table.

Treatments	Cocoon weight (gm/each)	Shell Weight (gm/each)	Silk Ratio (%)
local (H1)	2.67	0.41	15.52
DCS-9 (H2)	2.15	0.29	13.53
48-1 (H3)	2.24	0.30	13.28
DCH 177 (H4)	2.37	0.34	14.24
DCH519 (H5)	2.53	0.39	15.26
F test	*	*	*
F-test value	427.53	1262.6	300.87
S E±	0.01	0.00	0.06
P value (sig@ 5%)	-	-	-
Season			
Rainy Season (S1)	2.41	0.35	14.67
Winter Season (S2)	2.52	0.36	14.34
Summer Season (S3)	2.24	0.32	14.10
F test	*	*	*
F-test value	319.56	411.67	40.71
S E±	0.01	0	0.04
P value (sig@ 5%)	-	-	-
Interaction of genotype VS season			
S1 × H1	2.64	0.42	15.86
S1 × H2	2.21	0.31	13.83
S1 × H3	2.32	0.31	13.56
S1 × H4	2.40	0.35	14.75
S1 × H5	2.50	0.38	15.34
S2 × H1	2.77	0.43	15.36
S2 × H2	2.31	0.32	13.69
S2 × H3	2.35	0.31	13.30
S2 × H4	2.48	0.35	14.06

S2 × H5	2.70	0.41	15.27
S3 × H1	2.60	0.40	15.34
S3 × H2	1.93	0.25	13.09
S3 × H3	2.04	0.26	12.97
S3 × H4	2.22	0.31	13.92
S3 × H5	2.40	0.36	15.18
F test	*	*	*
F-test value	11.69	16.12	3.15
S E±	0.02	0.00	0.10

Results and Discussions:

The post –cocoon characters of Eri silkworm *Samia Cynthia ricini* during three seasons include cocoon weight (gm), shell weight (gm), silk ratio (%) are presented in the above table . Eri silkworm *Samia cynthia ricini* fed on five castor genotypes during three seasons have shown significant variations. Cocoon weight was higher during winter season and lower during rainy and summer season. Cocoon weight was 2.41 gms, 2.52gms and 2.24 gms, Shell weight was 0.35, 0.36 and 0.32 gms and silk ratio was 14.67%, 14.34%, and 14.10% during rainy, winter and summer season respectively. Cocoon weight has shown significant variations with the five castor genotypes. It was 2.67, 2.15, 2.24, 2.37, and 2.53 gms with local castor, DCS-9, 48-1, DCH-177 and DCH-519 castor varieties respectively and local castor and DCH-519 variety recorded significantly higher cocoon weights than the other varieties. Shell weight was 0.41, 0.29, 0.30, 0.34 and 0.39gms , silk ratio was 15.52%, 13.53%, 13.28%, 14.24%,and 15.26% with local castor, DCS-9, 48-1, DCH-177, DCH-519 castor varieties respectively and local castor and DCH-519 variety recorded significantly higher cocoon weights than the other varieties. Interaction of genotype VS season studies reveal that local castor was on par with other castor varieties, and summer season recorded minimum Cocoon weights than rainy and winter seasons. Cocoon weight was minimum 1.93 gms with DCS-9 variety during summer, and maximum 2.70 gm with DCH-519 during winter season. Silk ratio was minimum 12.97% with 48-1 variety during summer season, and maximum 15.86% with local during rainy season. Shell weight was minimum 0.25 gms with DCS-9 variety during summer, and maximum 0.43 gm with local castor during winter season, Genotype VS season studies reveal that cocoon weight, shell weight during three seasons was significant, and silk ratio during rainy season was significantly high.

The present study reveals that of the four genotypes DCH-519 and local genotypes were more yield full than the other genotypes. Temperature and humidity very much influenced the larval growth and among all the eri worms the white zebra colour larvae showed active feeding habits. Due to the higher leaf quality, higher rate of food ingestion and food assimilation may also have played a role in higher silk ratio in DCH-519 and local castor genotype. Nutritive values of local and DCH-519 castor genotypes may have influenced the larval duration and cocoon weight of the eri silkworms. The castor farmer can choose the hybrid DCH-519 genotype for eri culture as it provides substantial additional income and gainful employment to the poor dry land cultivators. Further investigations are to be done regarding the nutritive value of the castor genotypes.

Ichthyofauna and Hydrophytes floral Bio diversity in the Lower Manair Dam at Karimnagar district; Telangana State: India

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Introduction

Lower Manair Dam (LMD) a large new impoundment of Godavari basin with medium productive potential. The Lower Manair Dam is built across the Manair River, a tributary of the Godavari River. The construction of the dam was started in 1974 and was finished in 1985. The Lower Manair Dam is situated at Kakatiya Canal about 146.00 km to 234 kms and Distributaries D 84 to D 94 and DBM 1 to DBM2. LMD water goes up to 2, 62,326 ac s. The water of this Reservoir is used for drinking, agriculture and supports fish culture. The total area of the reservoir is about 8,103 hectare and maximum depth is 21.9m.

Lower Manair Dam had been rich fish productivity and in multi dimensional utilization of aquatic weeds. The fresh water aquatic weeds are directly or indirectly more helpful for food and shelter to reservoir fishery at Lower Manair Dam. They also serve as a potential source of energy (Majid, 1986). Macrophytes of different water bodies in India are studied by researchers such as Wetzel (1975), Majid (1986), Meshram (2003), Ambasht (2005) and Raut and Pejawer, (2005) and many more. The two most common measures of species diversity index are Simpson index and Shannon-Weiner index. The Simpson index is the measure of

diversity which takes into account both the number of species and the evenness of occurrence of individuals in the various species.

Materials and Methods

Fish samples were collected from different corners of LMD surrounding areas mainly by fishermen, fish collectors, local fish markets, and fish sellers. The photographs of the collected fishes were taken at fresh condition immediately and preserve in 10% formalin without any post-mortem stages and recorded vernacular name Hamilton-Buchanan, F, mainly on the morphometric and meristematic characters. Macrophytes were collected during three different seasons such as monsoon, winter and summer season by field visit to the spots. The survey was conducted to collect the information regarding floating, emergent, and submerged vegetation. The macrophytes were collected by hand picking, and also using nets and then brought to laboratory preserved in 10% formalin and identified using standard available literature (Cook, 1996).

Results and Discussion

The results of the present study revealed that the occurrence of sixty six fish species belong to nine orders, 20 families and 41 genera. List of LMD fish including their order, family, genus, species, common name, vernacular name, IUCN and CAMP status were recorded in the present investigation. Out of 66 species five are exotic species are available in Lower Manair Dam.

In the present investigation the number and percentage composition of families, genera and species under different orders are shown in Table 2 and Fig 2. Order cypriniformes was dominant with 27 species which contributed to 40.91% of the total 66 species followed by Perciformes with 15 (22.73%), Siluriformes 13 (19.70%), Channiformes 04 (6.06%), Anguilliformes and Beloiniformes each 02 (3.03%), Osteoglossiformes, Cyprinodontiformes and Mogiliformes each 01 (1.55%). Recorded families out of 20, Perciformes contributed 06 (30.00%) families followed by Siluriformes 05 (25.00%), Cypiniformies and Beloiniformes each with 02 (10.00%), Osteoglossiformes, Cyprinodontiformes, Anguilliformes, Channiformes and Mogiliformes each with 01 (05.00%). Recorded genera out of 41, Cypiniformies contributed 14 (34.15%) followed by Perciformes 12 (29.27%), Siluriformes 08 (19.51%), Beloiniformes with 02 (4.88%),

Osteoglossiformes, Cyprinodontiformes, Anguilliformes, Channiformes and Mogiliformes each with 01 (2.44%).

The number and Percentage composition of Population Status is 19 species were abundant which contributed to 28.79%, 22 species common which contributed to 33.33%, 14 species moderate which contributed to 21.21% and 11 species rare which contributed to 16.67% in the total catch. According to IUCN (2015.4) fifty four species contributed to 81.82% are least concern (LC), three species contributed to 4.55% are not evaluated (NT), four species contributed to 6.06% are data deficient (DD) two species each contributed to 03.03% are endangered (EN), not evaluated (NE) and one species vulnerable (VU). According to CAMP status (1998) twenty two species of fish are each with Low risk near threatened (LR nt) and not evaluated (NE) contributed to 33.33%, nine (13.64%) species of fish are vulnerable (VU), Eight species (12.12%) data deficient (DD), three (04.55%) species of fish is endangered (EN) and one species of fish each with (1.52%) Low risk least concern (LRlc) and A1 ac.

The results of the Hydrophytes study revealed that the occurrence of forty eight weed species belong to twenty orders, 33 families and four classes. The number of classes, orders and families under three types of weeds are noted. The free floating and emergent weeds are contributed each two class and submerged weeds contributed highest for four classes in LMD. Recorded aquatic weeds under twenty orders, the emergent weeds occupied highest 13 species, followed by submerged weeds (06) and free floating weeds (04). In 26 families which are the emergent weeds occupied highest is 15, followed by submerged weeds (06) and free floating weeds (05). Emergent weeds are dominant with 33 species which contributes 68.75% of the total species followed by submerged weeds with 10 (20.83%) and free floating weeds with 05 (10.42%). Shannon-Wiener Index diversity indices of fish species in Lower Manair reservoir represented in Table. The richness of fish species was highest in December 2014 and lowest in January 2015, the fish species diversity (H) ranged from 2.24 to 3.31. The highest diversity was recorded in September 2015 the lowest in February 2015. These results indicated that good diversity index having in the Lower Manair Dam.

Conclusion

The conservation of Ichthyofaunal biodiversity is one of the major environmental challenges. The present work will provide a latest database for reservoir authorities and fisheries department to help them for conservation of Ichthyofaunal diversity of Lower Manair reservoir. The control and eradication of unnecessary aquatic weed, predatory birds and fishes is must. A number of macrophyte species are available in Lower Manair Dam at monsoon period and post monsoon season. Free floating and submerged species are more dominant in all seasons. Emergent weed species are dominant in the winter season.

Table: 1. Number and percent composition of families, genera and species of fishes under various orders

S.No	Orders	Families	genus	Species	% of families in an order	% of genera in an order	% of species in an order
1	Osteoglossiformes	01	01	01	5.00	2.44	1.55
2	Cypriniformes	02	14	27	10.00	34.15	40.91
3	Cyprinodontiformes	01	01	01	5.00	2.44	1.55
4	Siluriformes	05	08	13	25.00	19.51	19.70
5	Anguilliformes	01	01	02	5.00	2.44	3.03
6	Beloniformes	02	02	02	10.00	4.88	3.03
7	Channiformes	01	01	04	5.00	2.44	6.06
8	Perciformes	06	11	15	30.00	29.27	22.73
9	Mogiliformes	01	01	01	5.00	2.44	1.55
Total		20	41	66			

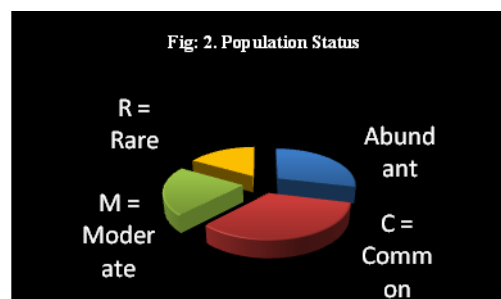
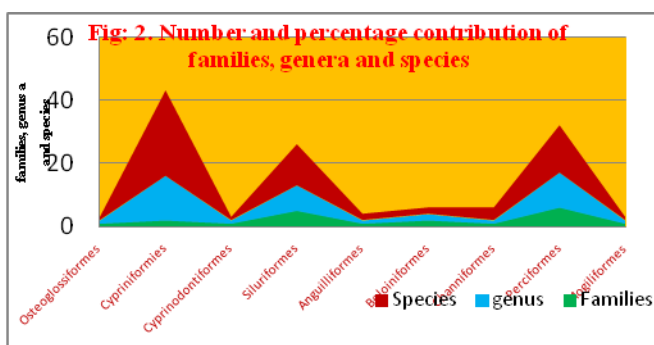


Table: 2. Number and Percentage composition of Population Status in the total catch.

Population Status	Abundant (76-100%)	C = Common (51-75%)	M = Moderate (26-50%)	R = Rare (1-25%)
Number of species	19	22	14	11
% Composition	28.79	33.33	21.21	16.67

Study of anatomical alterations in mango leaf due to gall infestation

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Abstract: Gall causing insect *Procontarinia matteiana* leads to the different anatomical alterations. The tissue damage includes palisade layer, xylem and phloem. Egg laying induces the gall formation. Larval development leads to the formation of larval chamber. Starch deposition occurs in the tissues nearby the chamber. Undifferentiation of conducting tissues was also observed. Hyperplasia and hypertrophy in palisade layer was observed in the tissues of the mango leaf.

Introduction:

A gall is a cumulative expression of a suite of adaptations achieved by the host plant for accommodating the inducing insect. In principle, a gall provides nutrition and shelter to the inducing insect and in few taxa, to its progeny as well. The insect activates a perturbation in growth mechanisms and alters the differentiation processes in the host plant, modifying the plants architecture to its advantages.

A majority of gall inducing insects stimulate the host-plant tissue to develop into galls by their action, whereas species of hymenoptera trigger gall development via oviposition even the vascular tissues can be modified by gall induction, so that they supply nutrients and water sub serving the needs of the inducing insect.

Materials and Methods:

Infested leaves of selected mango trees from the field were collected and washed properly with tap water for permanent preparations. Fresh leaves were selected for section cutting. Transverse sections of leaf were firstly transferred to the watch glass with distilled water. Then the sections were stained with saffranin for 3 minutes. These sections were washed with distilled water, and then passed through a graded series of alcohol for dehydration i.e. from 30% alcohol to absolute alcohol. Then the sections were stained with light green for 1 min. Lastly the sections were transferred to xylene for clearing & then mounted in D.P.X.

Observations:

In present work, the mango trees were infested with midge fly *Procontarrinia matteiana*. Egg laying itself initiates altering the shape and size of the tissues of leaves. Egg hatches to a larva. The larva when starts growing in size, it needs space and also protection, which is

provided by hyperplasia and hypertrophy of different tissues of the leaf (Fig.1). In present work, the hyperplasia resulted into the destruction of the chloroplast. Cell lysis was noticed in different areas of the plant tissues (Fig.2). This damage is due to the larval activity. Later on the larval chamber was formed (Fig.3), which increases with the size of developing larvae. Conducting tissues of the plant xylem and phloem were also observed to be damaged (Fig.4). Hypertrophy of the cells was noticed in the leaf tissues like palisade soft mesophyll tissue layer where gall formation takes place. Deposition of starch grains was observed near the larval chamber vessel elements xylem and phloem were not clearly seen (Fig.5).

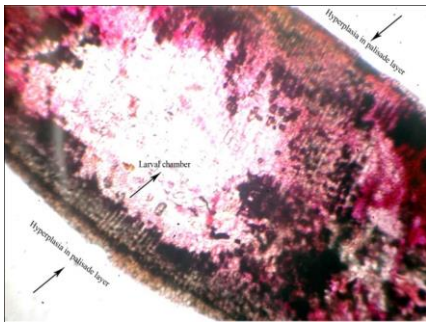


Fig.1: Hyperplasia in Palisade Layer

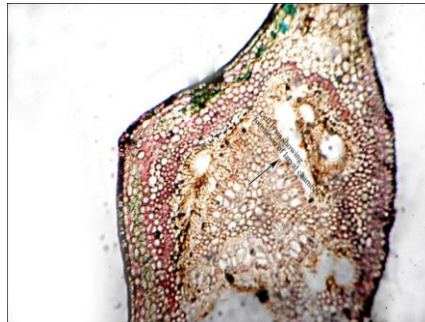


Fig. 2: Cell Lysis and formation of Larval Chamber



Fig.3: Larval Chamber

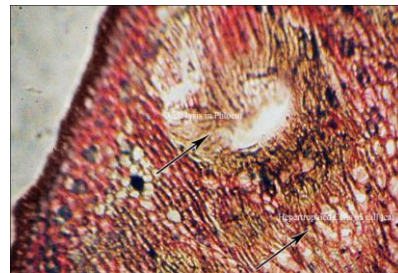


Fig.4: Undifferentiation in conducting Tissues

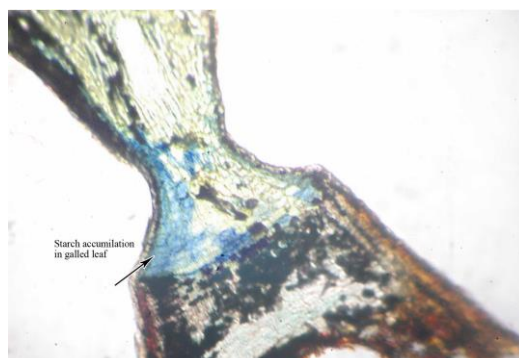


Fig.5: Starch Deposition

Discussion:

Gall infestation leads to the alteration in the plant tissues. Gall forming midge, when attacks the leaves of the mango tree, initially it does not make much difference in the normal tissues, but with the tissues alter due to feeding activity.

Eggs of *Procontarinia matteiana* (midge fly) deposited on the leaves triggers the induction of gall. The larval stages feed on the leaf, where the eggs are deposited and stimulates gall development by translocating a chemical stimulus on the leaf surface. Mc. Calla *et al* (1962), while working on the leaf gall induced by sawflies, he observed that the initial stimulus for the initiation of gall formation comes from the fluid formed in accessory glands of female which is injected at the time of egg laying. The saliva causes the lysis of the upper epidermis and mesophyll. This stimulus brings about hypertrophy of the cells next to the location of the deposited eggs. In the present investigation, undifferentiation in the vascular elements xylem and phloem was observe. The non differentiation of these lignified cells was also observer in the ambrosia galls induced by an unidentified species of cecidomyidae on leaves of *Baccharis concinna* (Arduin and Kraus, 2001) and may indicate that the energy otherwise used to differentiate lignified cells is deviated to other gall requirements. Phlomatic bundles indicate the establishment of a photosynthetase drain to the gall tissues (Rohfritsch, 1992; Sa *et al.*, 2009).

Numerous starch grains were found throughout the mesophyll of the round gall. This starch may provide a rich source of food for the midge larvae.

Galls are considered a significance drain of leaf resources (Fay *et al.*, 1993; Nayman and Julkunen-Tiito, 2001). Accumulation of food material such as starch was seen in cells may be functioning as the nutritive tissues. The galler has the potential advantage in insect plant relationships and morphological developmental and chemical aspects tend adequate support to the adaptive value of insects.

Helicoverpa armigera (pest) effect on Soybean crop in Nizamabad Dist., Telangana.

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Introduction: Soybean (*Glycin max*) is known as the GOLDEN BEAN of the 20th century. Though Soybean is a legume crop in the world accounting for more than 50% of oil seed production. It is known the second largest oil seed in India after groundnut. Above 80% of

global soybean output is crushed worldwide to obtain oil and meal. The soybean is largest sources which contain 43% protein, 20% oil. It grows in the varied agro climate conditions. It has emerged as one of the important crop in many countries due to its worldwide popularity. The international trade of Soybean is globally in several countries such as Japan, China, Indonesia, Philippines and India. European countries are importing Soybean to supplement their domestic requirement for human consumption and cattle feed.

Soybean is originated from China. For all practical reasons Soybean is an American crop today. USA is the major producer of Soybean and ranks first in production. Its share in the world is about 35%. Whereas India occupies 5th place. Soybean gaining popularity on account of unique characteristics and adoptability of varied agro climatic conditions food products and as source of animal feed.

In the Nizamabad Dist. Of Telangana most of the farmers use : 1) JS 335-95% (90 – 95 days) 2) PK 1029 3) MACS 450 (5% both 2 & 3 100 – 110 days) as soybean seeds.

Soybean is attacked by 273 insect pests at any stage from seeding to close harvest but are most attractive from flowering and it is an important note that soybean are very tolerant particularly in leaf damage.

Major Pests: 1) *Helicoverpa* sp 2) Pod Sucking Bugs 3) Silver Leaf White Fly

Helicoverpa

Helicoverpa armigera, *Helicoverpa punctigera*

Helicoverpa can severely damage all crop stages and all parts of Soybean . Soybean are the most attractive to *Helicoverpa* during the vegetative stage and can even damage during the seeding stage. However spring *H. armigera* outbreaks in Telangana.

Which hamper the crop production. Thus it is necessary to control insect pests of Soybean in the present experiment. Insecticide new and old molecular belongs to different type of pests suffering from *Helicoverpa* sp. Then spray 0.01% Endosulphan, 35 EC or Quinalphos when the disease is controlled by 15% only the crop age of 35 – 40 days. We spray monocrotophos 36 SC and Thymet (Rogor) 30 Ec 10-12 ml in 10 ltrs of water to spray the crop . The disease are controlled 50% when they are repeated after 15 days once in need.

Introduce bio agent *Beauveria bassina* fungus which is used for the control of pests. About 20 sp of potential predators and of Soybean pest have been found effective for biological

control. Normally biotech agents of eco system keep the natural control maintaining the balance of nature.

Botanical pesticide neem based pesticide such as azadirachtin 0.03 EC and Neebecidine 3ml in 1 litre of water can be sprayed to check the sucking insect and leaf feeding *Helicoverpa* sp. The disease are controlled 45% so mainly used for *Helicoverpa* sp. Bio pesticides are the future to save, support and control the environment position.



Medicinal effect of *Nigella sativum* and its uses in poultry
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Abstract

Several types of interrelationship of the nature occur between organisms of different species. The interaction can be between animal and plant, or between plant and plant food, shelter is being the most important factors for the survival of organisms are become central most biological relationship between organisms. In the Majority of these relationships the interacting organisms live independently as separate entities, yet affecting each other's life in some way or the other. There are however several instances of organisms in which two or more different species living together in prolonged more or less intimately organisms in which two or more different species living together in prolonged associations more or less intimately to fulfil their needs of nutrition and Shelter.

In case of domestic chick's and poultry we may find parasitism is a kind of association ship in which two different organisms of different specie will be present in which one is called as parasite who obtains the nourishment and get shelter from the body of host (the domestic chick). In such kind of association ship the parasites is the gainer and host will be looser.

Nigella sativa is also called as black – caraway, black cumin, fennel flower, nigella nutmeg-flower, roman-coriander or kalonji. Since ancient time it was using as anti-parasitic, anti-helminthic, antibiotic, anti-allergic medicine. Now days the research is going on for the

treatment of cancer. It is saying that it has every disease treatment except death so we are using this in poultry as anti-helminthic medicine.

Keywords: Parasitism, domestic, interrelationship, factors, entities, association ship, nourishment, anti-parasitic, anti-helminthic, antibiotic, anti-allergic.

Introduction

The chicken, *Gallus gallus domesticus* is a wide spread domesticated fowl. Human keeps chickens primarily as a source of food, consuming both their meat and their eggs. Human first domesticated chickens of Indian origin for the purpose of cockfighting. Adult male chicken over the age of 12 months are known as cocks, or roosters. Males less than a year old are called cockerels and castrated roosters are called capons. Female over a year old are known as hens and younger females as pullets. Although in the egg laying industry a pullet become a hen when she beings to lay eggs at 16 to 20 weeks of age. Chicken may live for five to ten years depending on the bread .The young ones are called as chicks and the meat is called chicken. In the deep south of the US chickens are also referred as the “yard bird”. Mostly they are present in open places, houses and poultry (Eyrinnaya.1993).

Adult roosters can be distinguished from the hen by his longer combs. Chickens are the most abundant and omnivorous bird in the wild. They often scratch at the soil to search for seeds, insects and even larger animals such as lizards, small snakes or young mice. So they become infected with different parasites which are already present in the soil (che ghani et al.,1993). So some parasites have been found in the external and internal body parts of chicken. Roosters can usually be differentiated from hens by their striking plumage of long flowing tail and shiny, pointed feathers on their necks and back which are typically of brighter, bolder colorful than those of females of the same breed. Adult chicken have a flesh crest on their heads called a comb or cockscomb and hanging flaps of skin either side under their beaks called wattles. These protuberances on the head and throats are called caruncles. Both adult male and female have wattles and combs but these are more prominent in males.

Study area.

The study area was Nizamabad, Telangana state, INDIA The mean maximum temperature is about 40 °C and mean minimum temperature is 20 °C (yakuba and singh 2001).

Sample Collection

Chickens were collected from different locations in the study area, June to January 2013 to 2014. According to the availability chicken brought was transported to zoology laboratory and then sacrificed or should be collected from local poultry shop. then examined for the presence of endoparasites from intestine.

Isolation and Identification:

Worming Chicken and other poultry is a straight forward process, but it does help to know a little bit about the worms that are likely to infect your birds and their life-cycle so you can control and manage their numbers, minimizing the worm burden on your flock.

This article describes the most common worms that infect chicken, (Valerie Saxion Bronze Bow 2003)

The most important group of worms that concern us are called Nematodes. These worms inhabit various parts of the digestive tract. Tapeworms which are a part of a group called cestodes found in the intestine.

Signs and symptoms occurs due to the presence of worms

The signs and symptoms of chickens with worms are having different symptoms.

- 1: The most common symptoms are loss of weight/ poor weight gain.
- 2: Increased feed consumption.
- 3: Pale yellow coloured wattles and flaps.
- 4: Diarrhoea.
- 5: Anaemia (pale comb and wattles).
- 6: Mortality.
- 7: If eggs are infected then if you keep them in water then they floats on the water surface where as good eggs settles down to the bottom.

For detail see figures given below



Cock and hen



Flap below beak



Infected cockscomb and flap (a-e) (a)



(b)



(c)



(d)



(e)

Diagnosing worms

Getting a 'worm egg count' is the way a vet would diagnose a case of worms. It can be done by submitting some fresh droppings (from as many of your flock, try to include caecal droppings too-the yellow-brown foamy colored dropping that is expelled every 24 hours)

Damage caused by worms

The damage caused by cestode worms will be in the part of the digestive tract in which the worms live. Typically in the gut, worms cause anaemia and haemorrhaging and in sufficient numbers can block the gut. They not only damage the gut but also take nutrients and their waste releases toxins.

Discussion:

According to this study it revealed that chickens play important role in parasitism type of inter association ship in which parasites causes harmful effects and diseases and utilizing them as food.

Some conditions due to which parasitic infection occur and spread are mentioned below are

1: Worm eggs thrive in wet, warm, muddy areas. Remove muddy areas such as those found by holes by free draining gravel.

2: If conditions are dry then no development of worm eggs.

3: Worm eggs can be destroyed by ultra violet light (UV) from the sun.

4: In poultry houses always keep the litter fresh and dry.

5: Should go for regular worming.

since the report revealed that the presence of these external and internal parasites of chickens in a developing environment like Telangana it become imperative to urgently institute control measure on these birds through massive public health education on improving the existing standard of environmental sanitary conditions. Therefore control measures should target. After identifying the parasite bearing chickens so by proper treatment we can save our chickens from diseases. So you can control and manage their numbers, missing the worm burden on your flock.

(Soulsby.LJE.1982)

Material & Method

Nigella sativum is a medicinal plant belongs to the family Ranunculaceae. Since ancient time this plant leaves, flower, fruit, seed, root, bark and branches were using in the treatment of different diseases. For each individual fowl we should give per day 5mg.

Mode of experimentation:

15 – 20 country fowls of age 6 – 8 months old were purchased from the local market and were reared in a shed located in Ahmedi bazaar, Nizamabad, Telangana. The birds were let free during the day and were let them allow to natural infection. They were allowed to get acclimatized in the new surroundings and also to the rest of the birds in the flock. Birds of both sexes were used but majority of them selected were of female sex for experimentation.

Faecal examination:

After getting the birds kept free for a month, until the parasites reach the puberty period. The bird droppings of all the birds were selected separately and are examined for the eggs of different cestode parasites in order to ascertain the nature of infection and collection of the eggs. The most common methods adopted were

- (1) Centrifugal floatation method and
- (2) Direct smear method

Centrifugal floatation method:

A sample of bird dropping weighing about 1 gm was ground in mortar and pestle and was mixed with 10 – 15 ml of water and stratified through a sieve or cheese cloth to discard the coarse faecal matter. The mixture was allowed to sediment for 10 – 15 minutes. By leaving it undisturbed or by light centrifugation for 10 minutes. Until the supernatant was clear. The sediment was mixed with a saturated solution of sugar, salt or zinc sulfate in a centrifuge tube (10 – 15 ml) and centrifuged for 1 or 2 minutes , at 500 rpm. The eggs floated to the surface were studied by touching the surface gently with the square cut – glass rod and transferring it on to the slide or the surface was covered with a coverslip. This method was adopted for saving time and greater accuracy.

Direct smear method:

Direct smear method is used not alone for faecal examinations but for oral and vaginal smears also. Mix the testing material properly and transfer a small amount to 4 or 5 drops of saline on a wide slide and mix to obtain a fairly dense, uniform suspension of loops. The

smear should not be too dense to see through it directly. Practice is needed to judge the proper density.

Mode of Application of Plant Extract:

Country fowls numbering 15 – 20 which were reared in the experimental areas were fed on pound Jowar grains daily twice and were left free in the area till it gets dark for their natural food which includes highly proteinaceous insects (Houseflies, dung beetles and ants of various species). These insects mostly harbour the cysticercoids numbering 1 – 22 each of different cestodes parasites of fowl.

The seed extract as anthelmintic was orally administered to a series of birds, until the appropriate dosage for the efficient elimination of the cestodes from the host's intestine was decided. The experimental dose was decided after repeated oral administrations for the test doses ranging from smaller to greater doses (200 mg – 1000 mg / kg body weight. The test dose or the experimental dose was administered to the birds which were weighed a day prior to the oral administration of anthelmintic and were leg banded with marked metal ring for identification. The drug was administered orally mixed with small quantity of food for complete consumption of the drug and continued experiments were conducted to study the effect of chemotherapeutic drug. The birds were examined in groups of 3 and at a time two batches of birds were studied for the results. The experimental dosage fixed for Neemol was 1 gm kg body weight and the duration for the autopsy was 5 days. The birds on the 9th day were decapitated.

The birds after oral administration were kept under observation for the general health condition, normal behavioural patterns and normally in egg laying. No adverse signs were detected following treatment and the birds were normal and active.

Result

After treatment with poultry we are getting

- 1: Heavy weight gain.
- 2: Less feed consumption.
- 3: Reddish pinkish coloured wattles.
- 4: Less mortality.
- 5: High egg laying capacity.
- 6: Disintegration of the body of parasites.

7: Excretion of the eggs of parasites from body to outside.

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A Centipede with evolutionary importance (*Scutigera coleoptrata*)

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Introduction:

Scutigera species is widely distributed in U.S.A. but also has its occurrence in India. Though it seems to be confined to Himalayan foot hills, it can also be expected in the plains of north Telangana like Karimnagar district. It inhabits in the black soils and red sandy loams with hot, moist semi-arid climate, in the temperate deciduous forests of north Telangana. This fast moving home centipede is found under stones and leaves in the agricultural fields with their nocturnal habit. And it is an oviparous animal.

Scutigera belongs to the phylum Arthropoda, subphylum-mandibulata, class-myriapoda, order-chilopoda, family-scutigeridae, sub family-scutigerinae, genus-*Scutigera* and species-*coleoptrata*. Like other centipedes, the body of this centipede is also divisible into segments. There are total 15 segments in a fully grown animal. It possesses many legs.

Material and Method:

This animal is found in Namsanipalli of Odela mandal in Karimnagar Dist of Telangana. It is collected in the agricultural field, while lying beneath the leaves. It is preserved as a specimen in formalin solution for further studies.

Result and Discussion:

Scutigera coleoptrata commonly called as home centipede is a fast moving animal with 15 body segments. Each body segment is provided with a pair of long legs. The trochanter and femur joint is fixed. Head is with a pair of compound eyes on either sides, and with a pair of long antennae. First pair of legs form poison claws. Last pair of legs are elongated and confuse the viewers as it is the other head side. Body of *scutigera* is covered dorsally with 7 tergites. Body is dorso ventral flattened. It feeds on small insects with the help of mandibles. It is said to have its

origin in Mediterranean region and had spread to other parts of the world.

Conclusion:

Scutigera species are the centipedes with compound eyes having more phylogenetic value in the evolutionary line. Other centipedes possess two groups of ocelli on head. They might have lost the compound eyes due to burrowing habit, Hence scutigera can be expected to have some evolutionary importance.

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