



# University of Pune

Board of College and University Development



**A**VISHKAR  
**2010**  
*A Success Story*

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**Concept by :**

**Dr. W. N. Gade,** Director, BCUD  
**Dr. Mohan Waman,** OSD, BCUD

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## FOREWORD



**Dr. Raghunath Shevgaonkar**  
Vice-Chancellor

India has been emerging as an economic powerhouse and also poised to become a knowledge superpower in next few decades. To facilitate and support the economic development we need trained and knowledgeable manpower, which will spawn innovative ideas and transform them in the right direction. To nourish and nurture the talent amongst students and teachers the culture of research is very vital in the higher education system.

India has demographic advantage and innovative minds compared to many developing and developed countries. However, these strength have to be properly nurtured and effectively utilized. There has to be a focused effort at every level of education systems for achieving excellence in research. The research aptitude has to be inculcated in the students from their young age. The potential researchers need to be provided adequate facilities and funds for carrying frontline innovative research.

On this background, University of Pune has taken important initiatives to introduce research culture amongst the students and teachers of affiliated Colleges and Institutes since last few years. Avishkar is one of the unique research project competition which has been initiated by Govt. of Maharashtra since 2006 and is implemented through Board of College and University Development (BCUD).

I am happy that BCUD has implemented this activity in the best possible way and special efforts have been made to increase the participation of the talented researchers from rural and urban areas. This activity has generated a lot of enthusiasm amongst students and Participation is ever increasing. University of Pune maintained the first rank since its inception which has resulted into an overall championship since last five consecutive years.

I would like to congratulate all the winners of Avishkar 2010 and compliment Prof. W. N. Gade, Director, BCUD and Dr. Mohan Waman , OSD, BCUD, for conducting the event so wonderfully.







## MESSAGE



**Prof. W.N. Gade**  
Director, BCUD

Scientific progress determines the socio-economic condition of the nation. We had galaxies of scientists like C.V. Raman, Homi Bhabha, Vikram Sarabhai, Ramchandran and so on who have made India proud with their scientific discoveries. India has a very large pool of scientific and technical manpower. There is a huge amount of budgetary provisions for scientific research. But still the outcome is not impressive. We need to involve younger generation into research. We have to initiate research schemes that take care of our requirements. We need to develop technologies for rural development, for solving India's water and power problems etc.

Realizing this need the Government of Maharashtra launched a major initiative, called 'Avishkar' in 2006 to inculcate the research interest among university and College students. Avishkar is a research project competition among the students. Students compete at the college, University and state level. The winners are suitably awarded. I am extremely happy to note that University of Pune has emerged winner every year since the beginning of this program.

We realize the importance of high quality research for technology development for nation building. We also realize the importance of knowledge of basic subjects and strengthening of concepts for formulating innovative research proposals. Therefore, at the University level we have launched many initiatives to promote creativity and originality among the students and young faculty members. This Avishkar 2010 is also step in this direction.

I thank the Hon'ble Vice Chancellor, Prof. R. K. Shevgaonkar for his continuous support and congratulate my colleagues in BCUD Dr. Mohan Waman, OSD and his team for carrying out this program successfully.





## From the Desk of OSD



**Dr. Mohan Waman**  
OSD, BCUD

It gives me an immense pleasure of present the abstract book of the student's research projects participated in the Avishkar competition during the year 2010-2011. Avishkar is a state level research project competition initiated by the Chancellor office of Government of Maharashtra during the year 2006. This activity is unique in its nature and gained a momentum during the last five years.

The research competitions were successfully conducted both at zonal and state level. It was applauded across the University for providing a platform to the young students for unfolding their talents. Innovative research projects were invited from bonafide, full time undergraduate, Postgraduate and Research Students as well as research teachers of colleges/ Institutions affiliated to University of Pune.

I am happy that University of Pune has displayed the outstanding performance by winning the overall championship fifth time in a row in the state level research project competition, Avishkar 2010 held at Maharashtra University of Health Science, Nashik, by winning Eleven First & Eight Second prizes. The success in Avishkar was possible due to the support of all the Principals, Academic Research Coordinators.

I am thankful to Hon'ble Vice Chancellor, Dr. Raghunath Shevgaonkar, Hon'ble Director, BCUD Dr. Wasudeo Gade and all the authorities for their support for conducting these activities.







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**DETAILS OF AVISHKAR & ANVESHAN****AVISHKAR: State level Research Project competition**

AVISHKAR is an Inter University research project competition for Undergraduate, postgraduate and M. Phil/ Ph.D. students. This activity is initiated by Hon'ble Governor of Maharashtra Shri. S.M. Krishna in 2006 which is on similar line as that of ASHWAMEDH, and Indradhanushya .The main objectives of AVISHKAR are follows:

- To inculcate research Culture among the College/ University Students.
- To encourage original and novel thinking.
- To provide an opportunity for expression of academic talent.
- To promote interaction among academia R & D Institutes and Industries.

**Criteria for Participation**

All Universities including Agriculture, non agriculture, Medical and Technology from state of Maharashtra can participate in this competition. Every University can send the entries in following categories for U.G., P.G, & Post P.G. level. There are no any boundaries of subjects and faculty for participation. Any student from any discipline can participate under any one of the following categories.

- |  |                                     |
|--|-------------------------------------|
| 1) Humanities, languages, Fine Arts Etc. | 2) Commerce, Management, Law etc.   |
| 3) Pure Sciences                         | 4) Agriculture and Animal Husbandry |
| 5) Engineering and Technology            | 6) Medicine and Pharmacy            |

**Age Limit**

- |                                      |   |                |
|--------------------------------------|---|----------------|
| 1) U.G. level category               | : | Up to 25 years |
| 2) P.G. level category               | : | Up to 30 years |
| 3) Post P.G level (M.Phil. / Ph. D.) | : | No age limit   |
| 4) Teachers                          | : | No age limit   |

**Number of Entries and Contingent**

University can send maximum two entries in each category at the U.G., P.G. , Post P.G. level (M.Phil. / Ph. D.) & Teachers with a total contingent up to 48 members excluding the team managers.

**Unique Model Developed by University of Pune**

University of Pune has implemented the activity in the best possible manner. University of Pune has taken special efforts to increase the participation of the talented students from rural and urban areas. Special efforts were taken to organize regional competitions, organize special training to these students and provide them necessary help and guidance to enhance their abilities to present their work in an effective manner. University of Pune has developed a unique model for implementation of AVISHKAR which resulted in the winning overall championship every year since beginning at the state level competition. This activity has generated a lot of enthusiasm amongst students and the participation is ever increasing. University of Pune has developed a three phase Model as follows

- PHASE-I : College level Competitions  
 PHASE –II : Zonal Competitions  
 PHASE-III : University level Competitions

**PHASE-I: College level Competitions**

All the colleges and Institutes do organize research project competitions at their colleges and use the same to select about five projects for Zonal competitions.



### **PHASE-II: Zonal Competition**

University of Pune organizes two day's zonal/regional competitions through BCUD at nine places in Pune, Ahmednagar and Nashik districts during the month of **September**. The information about details of the competition including the Place and the coordinator will be communicated to Principals of the colleges and also put up on website. ([www.unipune.in](http://www.unipune.in); [www.unipune.ac.in](http://www.unipune.ac.in) )

The students are advised to register for the competition through Principal of the college. Lectures of experts from different discipline are also organized during the competition.

### **PHASE-III: UNIVERSITY LEVEL COMPETITION**

To select the competitive students from various regions for state level competition, University of Pune organizes University Level competition during the month of **November /December**. Students selected from zonal competitions are allowed to participate at University Level Competition. Detail information about the competition including the Place, date and Time will be communicated to Principals of the colleges as well as zonal coordinators and also put up on website. ([www.unipune.ac.in](http://www.unipune.ac.in) )

**First round:** In the first round of competition Poster presentations of selected students are organized. About five posters are short listed by experts for oral competition.

**Second Round:** Short listed projects from Poster presentations are given 8-10 minutes for oral presentation. Two projects are short listed from each discipline and category for state level competition. From second round Maximum 5 Students from each category are short listed for workshop at university level.

### **STATE LEVEL COMPETITION**

The state level Competition is organized for **three days** as per the directives of office of Governor of Maharashtra. Host University provides local hospitality to the team members and also provides the infrastructure for exhibition and exhibits of research projects.

**Day1:** Poster/ Model display of research projects in the form of exhibition to be judged by three judges, is the elementary round.

**Day2:** Oral presentation using LCD for the students of the selected /short listed research projects in each category.

**Day3:** Discourse by the eminent judges on various aspects of research projects in relevant areas followed by prize distribution ceremony in the evening

*Note: exhibition gets dismantled only on the fourth day and activities of all the three days get open to the students, academia and general public.*

### **Important Instructions:**

- Each team should come with preparation for poster and oral presentation of 10 minutes duration; it is followed by discussion. LCD or Overhead Projector is provided.
- The short listed participants will have to make oral presentation of their research projects.
- The project/ Exhibits are evaluated by the nationally reputed experts and their decision will be final.
- Participants will be allowed to the Exhibit only after the confirmation of College/ University Identity Card.
- Participating Universities must send list of participants (Students & Teachers) before 10 days of competition.
- The awards in each category are as follows:-
  - o First Prize      Rs. 5000/-
  - o Second Prize Rs. 3000/-

Individual category wise trophies are awarded as per the number prizes won by particular University and the **Overall Championship Trophy** to the University getting maximum prizes.

- Certificate of participation is given to the participants.

#### **ANVESHAN: National Student Research Convention**

The Association of Indian Universities (AIU) has taken a pioneering initiative to organize student research conventions for the aspiring researchers throughout the country to inculcate research culture in higher education institutions. These conventions aim at identifying the young and rising talents who would be promoted through proper encouragement and incentives. Also an attempt shall be made to commercialize their research projects with industrial collaboration. The endeavour may accelerate scientific research and innovation and their application towards community development percolating to the grassroot level. Anveshan enters the second year after its immense success at the first stint. **Anveshan 2008** was applauded across the country for providing an innovative platform for students and generating particularly a culture of research among young students.

#### **Objectives**

- To identify young talents with research aptitude and interest to take up research as a career.
- To promote the talent in research throughout the country.
- To nurture the talent through specialized training and education in some of the nationally and internationally reputed premier institutions of higher learning in the country.
- To augment financial and physical resources through collaboration with different sponsors for supporting education and training of the young researchers.
- To provide proper incentives to enhance the skill of potential students
- To initiate an intensive research culture in a selected group of institutions

#### **Areas/Fields**

The areas/fields in which Projects (**Individual and group projects\***) are invited:

- Basic Sciences
- Engineering & Technology
- Allied Sciences

\* In case of a **Group project**, only three members [one principal investigator and two major contributors] are allowed to participate in the zonal/ national convention.

#### **Type of Project**

Projects on the above mentioned areas must have undergone some exploration/ ground work in order to show its impact

#### **Methodology**

The duration of the convention is three **days**

The convention is held in **three phases**.

- I. In the **First Phase**, all universities in the country will be requested to organize an exhibition of research projects at **University level** in which students from **affiliated/constituent colleges, research institutions and university post graduate departments** will participate. The exhibited projects are scrutinized by a team of experts.
- II. In the **Second Phase**, the exhibition is held at **Zonal level** for which four universities, one in each zone, have been identified (calendar enclosed for details). From each zone **best 15** projects are given entry to compete at the **National level**.

III. In the **Third Phase**, the exhibition/competition are held at **National level**. The Association of Indian Universities invite for the successful projects, selected through the zonal competition, for National level competition. A total of **60** selected projects are displayed for assessment at the National level out of which **15 projects** are finally selected.

#### **No. of Projects**

Each university is allowed to send a maximum number of **five** projects for the zonal level Student Research Convention.

In case of the universities/ institutes not having courses/ programmes in all the above mentioned categories, entry of five projects in their respective fields are also entertained.

The projects are assessed by a panel of experts drawn from various disciplines. The students whose projects are selected in the final stage at national level convention will be promoted through proper incentives for career development in research.

#### **Criteria for Assessment of Projects**

All the projects are assessed on the basis of following criteria. Each criterion is assigned some weightage. The final selection of projects is based on the cumulative weightage based on all criteria.

#### **Criteria**

- Scientific Thoughts and Principles
- Creativity
- Thoroughness
- Skill
- Relevance
- Cost Effectiveness
- Teamwork

Apart from the above criteria, **Scope of Commercialization** of the projects will be considered as an **additional merit**. However, there will be no weightage point for this criterion. In case of the projects having scored equal cumulative weightage point, this criterion will be considered for making the final decision.

#### **Eligibility for Participation**

Entries of the research projects are purely **Institutional** and only bonafide fulltime students from Postgraduate to Doctoral degree level are eligible to take part in the convention.

#### **Entry/Registration Fee for Zonal level Convention**

Entry - Rs. 500/- (per member including accompanying staff)

(The entry fee for **zonal** level competition in the form of **Demand Draft** drawn in favour of **Association of Indian Universities, New Delhi** and the **Registration form** should be sent to the Coordinator, Research Division, Association of Indian Universities, New Delhi with a **copy** to the coordinator of the **Organizing University**) **There is no registration fee for National level convention.**

#### **Boarding and Lodging**

At zonal level, the host university will make the arrangement for accommodation; breakfast, lunch and dinner at reasonable rates on payment. Those requiring such facilities may contact the Coordinator of the host university (**Pl. see the calendar for the name and contact details of the zonal coordinators**)





## **Biotechnological Implementations of an Aerobic bacterium *Zoogloea ramigera* in Sewage Water Treatment**

**Ms. Syed Tehreem Ah. Ali.**

J.A.T. Arts, Science & Commerce, College Malegaon, Nashik  
*First Prize (UG) in Pure Science Category, AVISHKAR- 2010*

### **ABSTRACT**

The primary Properties of sewage treatment is to remove the organic matter from it. These components hat make receiving water bodies become an aerobic. The sewage treatment may involve removal of these components by the aerobic respiration of micro organisms such as an aerobic bacterium *Zoogloea ramigera*. This bacterium is an aerobic, gram negative, flagellate bacillus, produces flocs in the activated sludge because it has slimy capsule made up of polysaccharides, which degrades the organic material of sewage.

Activated sludge is most commonly used modern process of biological sewage treatment. In this method sewage containing organic matter inoculated with the aerobic bacterium *Zoogloea ramigera*, & it is aerated through the air pump in an aeration tank. This content in the reactor is called as mixed liquor. Under aerobic condition, the bacteria metabolize the soluble and suspended organic matter coming from the primary treatment.

The Zoogloea cells has a slimy capsule made up of Polysaccharides forming a Zoogloea matrix which is made up of D-Glucose, D- Galactose & Pyruvic acid in the molar ratio of 11:3:1.5 and PHB(Poly-B-Hydroxy butyrate an intra cellular lipid reserve. It also has an enzyme Ketithiolase which involve in the formation of PHB. These forms a extra cellular polymers which shows poly electrolytic properties, hence attracts the highly concentrated metal ion from the sewage water & causes elemenation of Fe, Mn, Cd, Cu, Ca, Co. Si, Al etc by oxidation,

Zoogloea causes the reduction in BOD level of sewage water by its ability to low down BOD & by promoting the formation of sludge deposits and bioapsorption of metals during sewage treatment.

**Key words:** Activated sludge, Zoogloea matrix, Flocs, Poly-B-Hydroxy butyrate, Ketothiolase, Polyelectrolytic properties.

## **Biomimetic Robotic Arm**



### **Mr. Kedare Hemant Arun**

*Ahmednagar College, Station Road, Ahmednagar – 414 001  
First Prize (PG ) in Pure Science Category, AVISHKAR- 2010*

#### **ABSTRACT**

This project deals with the development of a Humanoid Robotic Arm. An array of sensors is mounted on the Human Controller, who is interfaced to this arm.

The Robotic arm mimics the movements of the Controller in real time, on sensing the change in position of the controller's arm. In the initial part of the experiment, the concept is proved by mimicking only the elbow movement of a human arm. Further development shall proceed on similar lines. Resistive Transducers (Potentiometers) are employed for their ease of use and cost effectiveness. When the controller moves his arm, the resistance of the potentiometer changes and it generates a analog voltage signal. This signal is given to a Atmega 328 Microcontroller with 10 bit ADC which is programmed to move the robotic arm to the same position as the controller's arm by driving a stepper motor, thus, mimicking the movement of the controller's arm.

#### **Applications:**

- 1) Aerospace: Astronauts can perform spacewalks using robots equipped with these arms without having to leave the protection of the spacecraft.
- 2) Prosthetics/Cybernetics: People who have been paralysed or lost limbs in accidents or paraplegics & quadriplegics may be implanted with this arm.
- 3) Defence: Exoskeletons can be developed using this technology that can help soldiers lift and carry heavy loads and also increase their endurance & survival.
- 4) Telemedicine: Doctors can perform surgery using this arm from anywhere in the world.
- 5) Haptics & Augmented Reality.



## Mwi Assisted Synthesis and Biological Evaluation of Novel Condensed 2*H*-4-arylamino-Pyrimidines for Antitumour Anticancer Activity

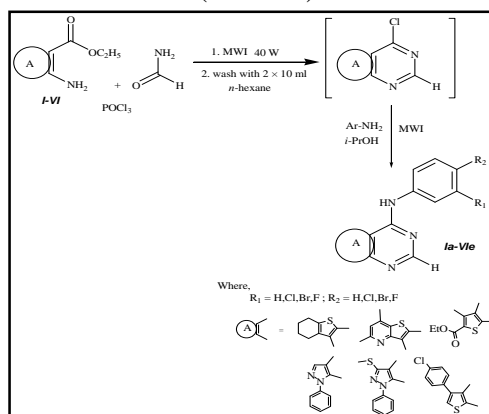
*Prof. Manisha Phoujdar*

*Sinhgad College of Pharmacy, Sinhgad Road, Pune.*

*First Prize (Teacher) in Pure Science Category, AVISHKAR- 2010*

### ABSTRACT

Design, development and synthesis of NCE libraries to provide valuable leads for new therapeutic targets in a very short time period is key input for New Drug Discovery Research. The present study report the development of a novel, one-pot protocol for the rapid, high throughput synthesis of condensed 2*H*-4-arylamino-pyrimidines, adaptable to parallel synthesis of their compound libraries. The overall three step reaction protocol has been converted to one-pot single step reaction, reducing the overall reaction time from 76 hrs to 40 min! and increasing the yield to 80-97% from 60%! (**Scheme**)



**Scheme**

A total of 30 derivatives, from six different condensed heterocycles have been synthesized. These were evaluated for antitumor-antiproliferative activities against five different cancer cell lines, using Gefitinib and Cyclophosphamide as standards.

While, against EAC cell line (Ehrlich ascites carcinoma) two compounds are comparable to most active drug gefitinib, against HeLa (Cervix cancer) and HT-29 (Adenocarcinoma) cell lines fourteen and six compounds, respectively are found to be more active than gefitinib. Majority of compounds have exhibited better activity than cyclophosphamide. A 3D-QSAR as well as *in-silico* ADMET study has also been performed.

The compounds were tested against various bacterial and fungal strains. 19 compounds were found to be more effective than standard ciprofloxacin against various gm +ve and gm – ve strains and eleven compounds were found to be more effective than standard ketoconazole against fungal strains.





## A Novel Nanotechnology for Sugar Production from Starch

*Parul Sharma*

Fergusson College, Pune

*First Prize (UG) in Agriculture & Animal Husbandry Category,*

*AVISHKAR- 2010*

### ABSTRACT

In present investigation ZnO nanoparticles were interacted with *Bacillus* amylase under laboratory conditions. To study enzyme nanoparticle interaction, *Bacillus* amylase was dissolved in phosphate buffer and assayed for its activity. After preliminary assay the enzyme was interacted with ZnO nanoparticles at 30 °C temperature for 30 minutes and then used for assay with soluble starch solution. The enzyme without nanoparticles was used as control. Results indicate that the amylase when interacted with ZnO particles, show enhancement in its activity. This was further tested at various temperature and pH conditions. Maximum activity was observed at pH 8.0 and 60 °C temperature in the reactions where amylase was interacted with ZnO as compared with enzyme alone. The enzyme interactions with nanoparticles were confirmed with UV-Vis spectrophotometer and FTIR.

To avoid entry of ZnO nanoparticle in the product the entire reactions were carried out in dialysis tubing (High media -pore size 12 nm). The results indicate that Amylase interaction with ZnO particles enhances sugar production by 40-50 %. The added advantage of the techniques is that enzyme can work longer time and remain separated from the product. As the enzyme is adsorbed on ZnO particles it remains stable for minimum 6 to 8 days.

Enzyme adsorption to nanoparticles might be the reason for enhanced activity of the enzyme. The present investigation is novel technique to enhance sugar production from starchy materials and has many applications in industries like, alcohol, beverages and confectionary.

**Key words:** *Bacillus amylase, ZnO nanoparticles, interactions*



## A Unique Formulation to Control Oily Spot Disease of Pomegranate

**Dr. S. L. Laware**

Department of Botany, Fergusson College, Pune-04

First Prize ( Teacher ) in Agriculture and Animal Husbandry Category,

AVISHKAR- 10

### ABSTRACT

Pomegranate is an important fruit crop grown in the dry regions of India. In Maharashtra, about 1.10 lakh farmers cultivate pomegranate as one of the important fruit crops. The area of cultivation under this crop is 93,500 hectares with the production of 6,01,500 metric tons (MT). The state accounts for over 90% of pomegranate production in the country. Pomegranate production has been suffering for the last seven years because of the “Oily spot disease”. The situation is worst in Maharashtra as 90% of the area under Pomegranate cultivation is affected by this dreadful disease. The losses of Pomegranate cultivators in Maharashtra are estimated to be around Rs.1300 Crore.

The scientific community has failed to control the disease and hence recommended the Government to stop fresh planting and go for a crop holiday for 10 years. Central Government announced a package of rupees 1000 crore to pomegranate cultivators as compensation and of the total package, farmers in the state were eligible to receive Rs 900 crore. (Rs. 50000/ per hectare) However, farmers are asking for the better solution and not a packages. With this view we have isolated *Xanthomonas axonopodis* pv. *punae* on PDA medium from infected pomegranate leaves.

About 150 different formulations were tested for inhibition of bacterium *Xanthomonas axonopodis*, pv. *punae*. Under laboratory conditions. Out of that, two formulations were found excellent for complete inhibition of bacterial growth under laboratory conditions. These were tested on filed grown plants. Results are encouraging and these formulations have potential to control bacterial blight of pomegranate.

**Key words: Bacterial blight, pomegranate, chemical formulations,**



## **Performance Analysis of Dual Purpose Refrigeration System using Liquefied Petroleum Gas (Hydrocarbons) as Refrigerant**

**Sarvesh Kiran Deogaonkar**

MET`S Bhujbal Knowledge City, Institute of Engineering, Adgaon, Nasik  
*First Prize (UG) in Engineering & Technology, AVISHKAR- 2010*

### **ABSTRACT**

The purpose of this experimentation is to study the feasibility of using LPG (Hydrocarbons) as alternative for conventional refrigerants. Also to investigate the performance of dual purpose refrigeration system for energy efficiency and environmental safety, since it has been proven that widely used refrigerants [viz. R12, R22, and R134a] are environmentally unfriendly and hazardous.

Domestic LPG with 27% propane and 70% butane has been tested in test rig named dual purpose refrigeration system. Continuous running tests were performed on the system with constant mass flow rate and varying load for sixty minute. The test results showed that LPG may serve as one of the best refrigerant in future. The pull down period and refrigeration effects was satisfactory for the system and besides of this the power consumption and environmental impact are 100% less than any other conventional refrigeration system.

In conclusion the proposed LPG refrigerant seems to be an appropriate long term candidate to replace existing refrigerants and the dual purpose refrigeration system and its scopes may going to be the best contender in the future market of refrigeration and air conditioning.

**Key words**-Domestic LPG, Pull down period, Power consumption, environmental impact.



## **Design and Implement Intelligent Vending Machine**

***Manjusha Madan Lanjewar***

*Sinhgad College of Engineering, Vadgaon (Bk.)*

*Pune*

*First Prize (PG) in Engineering & Technology, AVISHKAR- 2010*

### **ABSTRACT**

The focus is to make existing vending machines much smarter to cater needs of ration outlets in INDIA. We propose a new Intelligent Vending Machine (IVM©). Intelligent Vending Machine is an innovative concept which will check an identity of customer for grocery dispensing machine. Also this system will carry out real time weighing of grocery and dispense the grocery to authentic person. Grocery will be dispensed as per units allocated the particular family only after payment is made.

IVM© will provide a transparent mechanism which should be kept for ration distribution so every needy person will get his/her share of ration by giving alerts to customer regarding arrival of stock. It will also generate reports regarding total number of ration shops in particular village/ town/ city, total number of customers registered in particular ration shop, to search particular customer from his/her ration card number and to search particular customer of particular village.

**Keywords:** - Intelligent Vending Machine (IVM©)



## **Performance Assessment of Air Conditioners with HC-290**

**Mr. K.V. Mali**

Sinhgad College of Engineering, Vadgaon (Bk.) Pune  
*First Prize ( Post PG ) in Engineering & Technology  
Category ,  
AVISHKAR- 2010.*

### **ABSTRACT:-**

HCFC-22, widely used in room air conditioners, has to be phased out by 2030 under Montreal Protocol. HC-290 is being considered as alternative to HCFC-22.

A 5.13 kW capacity split air conditioner designed for HCFC-22 was considered. After establishing the baseline performance data with HCFC-22, the unit was retrofitted with HC-290. Under the drop-in test, the cooling capacity with HC-290 was lower by 6% and COP higher by 14%. The optimized charge of HC-290 was about 50% of HCFC-22 by weight. A 30% larger condenser gave 1.6% lower capacity and 10% higher COP. With a 10% higher capacity compressor, the cooling capacity was improved by 2.8% and COP was lower by 1.1%. In the case of 5 mm condenser tube OD, COP was 16.4% higher than HCFC-22 with equivalent cooling capacity.

ORNL Heat Pump Design Model was used to predict the performance of the systems with HC-290 and to optimize the system.



## **Development of an Ecofriendly Herbal Mosquito Repellant**

**Ninad Vijaykant Shendye**

Seth Govind Raghunath Sable College of Pharmacy,  
Saswad,Pune.

*First Prize ( UG) in Medicine & Pharmacy Category, AVISHKAR- 2010*

### **ABSTRACT:**

Pyrethroid based mosquito repellents, available in the market contain some harmful and poisonous chemicals which are likely to cause threat to human health. An attempt has been made to prepare a 100% herbal product, based on traditional practices and rural wisdom. It is effective, safe and cheaper than presently chemical based mosquito repellent. Since it is made up of herbal material i.e. neem, vekhand, peppermint oil, lemongrass oil, tulsi, it has no side effects on inhalation or even on digestion. Present research work deals with selection and optimization of ingredients, their characteristics, medicinal properties and studies conducted about the comparison with the existing mosquito repellent. The cow science is an ancient science and cow dung is considered very sacred in Indian philosophy, it says that Gomay Waste Laxmi i.e. ‘Goddess of Wealth’ resides in cow dung. The efforts are made to study the traditional beliefs from scientific approach. The main aim of this product development is to provide employment to the rural youth and economic gains to farmers.

**Keywords:** Cow dung, mosquito repellent, herbal product, rural employment





## **Chicken Ileum: Ethical & Economical Alternative to Laboratory Animals**

**Mrs. Vaishali Undale**

Seth Govind Raghunath Sable College of Pharmacy, Saswad, Dist- Pune.  
*First Prize (Post PG) in Medicine & Pharmacy, AVISHKAR- 2010*

### **ABSTRACT**

Animal testing means the use of non-human animals in experiment About 50 to 100 million vertebrates including rodents and non rodents are used for the purpose of such experiments in education and research. The non judicious use of these animals has affected the eco system and therefore many countries and scientists are looking for the alternatives for animal testing. The two major alternatives to *in- vivo* animal testing are *in-vitro* cell culture technique and in silico computer simulation. Still the alternative to animal testing needs to be developed. The present study was undertaken to exploit the small intestine of chicken for isolated tissue experimentation which is a waste organ easily available from slaughter houses. The previous studies on chicken small intestine revealed the presence of tachykinin, histaminic and motilin receptors. In the present study a part of small intestine was mounted in Student's Organ bath in different physiological salt solutions. The contractile responses of variable doses of Acetyl choline and histamine solution were recorded on kymograph paper. The experiments were repeated to check the reproducibility, sensitivity and accuracy. The experimental conditions were optimized to find suitable physiological salt solution, tissue length, magnification value and load. The study showed that the chicken ileum may be one of the best, cheapest and easily available non mammalian tissues for experimentation on isolated organs for educational as well as research.

**Keywords:** Chiken ileum, isolated organ, students organ bath



## Novel Molecular Beacons for Cancer Theragnostics

**Dr. G. R. Aland**

Sinhgad Technical Education Trust's Smt. Kashibai Navale College of Pharmacy, Kondhwa (BK), Pune.

*First Prize (Teacher) in Medicine & Pharmacy, AVISHKAR- 2010*

### ABSTRACT

The idea of merging biological and non-biological systems at the nanoscale level is an emerging tool for diagnostic and therapeutic applications. Today, genetic investigations revealed link between mechanisms of microRNA (miR)-mediated gene silencing and human diseases including cancer. In this regard, “miR”acles in gene regulation in eukaryotes takes place to a large extent at the RNA level. Today, discovery of miR in human viruses already points to opportunities for diagnostic and therapeutic intervention. However, today a clear picture of gene regulation by miR is yet to emerge. One of the major reasons is absence of specific probes for disease corresponding miR detection.

This research work describes novelty in synthesis of a single chemical entity which acts as biosensor, biomarker and antisense agent for cancer theragnostics. In this, we synthesized the novel molecular beacon/s using *aminoethylglycine*-peptide nucleic acid (*aegPNA*) and gold nanoparticles (AuNPs) as biosensor which detected cancer corresponding miR-309 at nanoscale in a minute using confocal microscopy. For this, molecular beacon (PNA) used as a template to organize anionic microRNA with gold nanoparticles. The biosensor studies carried out by spectroscopy, microscopy and microcalorimetry. The same nanocomposites of *aegPNA* and AuNPs demonstrated to mark level of disease using mass spectroscopy whereas amount of cancer corresponding to miR showed with respect to mass intensity of the miR:*aegPNA* complex. This demonstration enabled application in detection of deadly diseases viz. cancer, diabetes and AIDS at an early stage of disease is a *proof-of-concept*. The same molecular beacon as therapeutic agent is currently underway. Future work is directed towards examining the AuNP-mediated assembly of miR into different topological constructs and functional organization of such assemblies to performance materials. In this, synthesis of molecular beacons, their characterization, biophysical and thermodynamic studies with functioning on such nanocomposites with cancer-corresponding microRNA-309 will be presented.

**Key words:** microRNA, gold nanoparticles, biosensor, biomarker



## **Emotional Intelligence and Adjustment Among Adolescents and Young Adults**

**Shruti Lahoti**

Department of Psychology, Fergusson College, Pune  
*Second Prize (PG) in Humanities, Languages, Fine Arts  
Category, AVISHKAR- 2010.*

### **ABSTRACT :-**

The present study was conducted to study the emotional intelligence and adjustment in adolescents and young adults. The sample consisted of both boys and girls in the age group 16-25 years (n = 150). Bell's Adjustment inventory and Thomas and Sushama's Emotional Intelligence Inventory (EII) were used. Pearson product moment revealed that interpersonal efficacy positively associated with social and emotional adjustment; personal efficacy and intrapersonal efficacy and overall emotional intelligence were positively associated with home, health, social and emotional adjustment. Simple regression showed that overall emotional intelligence was a significant predictor of the four types of adjustment. Stepwise Multiple regression showed that intrapersonal efficacy was a significant predictor of home adjustment; intrapersonal efficacy, personal efficacy and interpersonal efficacy were significant predictors of health adjustment; interpersonal efficacy and intrapersonal efficacy were significant predictors of social adjustment; and intrapersonal and interpersonal efficacy were the significant predictors of emotional adjustment. The results are discussed in Indian psychosocial context.

**Key words:** Emotional Intelligence, Adjustment, Adolescents, Young adults



## Novel Liquid Organic Fertilizer

**Gopal Bhagwan Deore**

Department of Botany, Fergusson College, Pune-04  
*Second Prize in (Post PG) in Pure Science Category, Avishkar-2010*

### ABSTRACT

To meet India's sustainable agriculture and environmental goals organic farming will play an important role in the development of a sustainable and high quality food production system. Organic fertilizers such as manure have been used in agriculture for thousands of years. After 19<sup>th</sup> century Green revolution technologies involving greater use of synthetic agrochemicals with adoption of high-yielding varieties of crops have boosted the production output per hectare in most cases. However, overuse of these synthetic agrochemicals, especially in vegetables and fruits, resulted in residues above safety levels and shows the ill-effects of modern agriculture; even drinking water was not spared. Due to these perilous effects of synthetic agrochemicals the demand for organic food is steadily increasing both in the developed and developing countries with an annual average growth rate of 20–25%. But, organic fertilizers are not abundantly available and on plant nutrient basis is more expensive than chemical fertilizers.

To prevail over these problems, present investigation has been made to formulate value added liquid organic fertilizer. The methodology for production of novel liquid organic fertilizer was alienated into five major factions *viz.* 1) production of compost lechate, 2) solubilization of phosphate, 3) solubilization of potassium, 4) production of micronutrient chelates and 5) composite novel liquid organic fertilizer. The final formulation was evaluated for its physicochemical parameters; and found to be well-heeled with required macronutrients and micronutrients as well as cost effective. The efficacy of novel liquid organic fertilizer were determine by foliar spray on tomato (*Lycopersicon esculentum* L.) and chilli (*Capsicum annum* L.) as test crops; the results obtained are fascinating.

**Keywords:** Sustainable agriculture, environment, organic farming, novel liquid organic fertilizer, cost effective.

## The Geo SCC Model



**Manisha B. Patil**

Department of Computer Science, University of Pune  
*Second Prize (Post PG) in Pure Science Category, AVISHKAR-2010*

### **ABSTRACT**

Cellular Automata (CA) is an effective simulation technique to study urban phenomenon at larger scale from different perspectives of planning and development. The information so generated by CA encoding would not only serve as baseline data but also help in providing predictive scenario to categorize the areas for sustainable urban development. Also to improve the memory capacity and transmission time over network traffic for such huge information Run Length Encoding Compression technique has been used to compress such huge data. Geographical Information System (GIS) is a technology that is used to view and analyze data from a geographic perspective.

This paper demonstrates the GEO SCC Model which has basically 5-6 tools named as Geo Simulation Tool, Geo Compression Tool, Geo statistics Tool, Geo Calculation Tool, Tool to access GIS software to process geo data. Geo Simulation tool has functionality to predict futuristic view of the year 2020 for LANDSAT satellite data of 2006. It can also classify satellite images into different classes. The result includes statistical details of built up growth (63.64%) of the area under consideration. Geo compression tool has functionality to compress geo data with the help of Run length encoding technique. Geo Statistics tool provides statistics details of different land use and land cover classes like built up, vegetation, barren land, and water bodies. This model also provides the easy access to existing GIS softwares to process geo data base.



## Novel Polyherbal Toothpaste

**Ms. Poojari Savitri Kasappa**

SGMPM's Sharadchandra Pawar College of Pharmacy, Otur, Dist- Pune.  
*Second Prize (PG) in Medicine & Pharmacy, AVISHKAR-10.*

### ABSTRACT

As per Ethnobotanical reports *Cocos nucifera*, *Vitex negundo*, *psidium guajava*, and *Azadirachta indica* are some of the plants used in Toothache. To prove this effect and inturn reproduce its use in human beings a polyherbal formulation is aimed. In Present study *in-vitro* analysis was carried out using different microorganisms like *Staphylococcus aureus*, *Bacillus subtilis*, *Pseudomonas aeruginosa* and *Candida albicans* and observed zone of inhibition by using agar diffusion method. Further mouth swaps and saliva samples among various population before and after brushing were tested for colony count by pour plate method at 37°C for 24 hrs. The formulated toothpaste was evaluated by physical, pharmaceutical, percentage bacteria reduction and zone of Inhibition and compared with the control and Standard where the formulated toothpaste was found to be more efficient as compared to standard. Further the stability studies for the formulated toothpaste will be carried out.

**Keywords:** *Cocos nucifera*, *Polyherbal Toothpaste*, zone of inhibition.





## **The shifting pedagogic, a case study on educational electronic content created on the subject of 'Effective Communication'**

**Damle Balkrishna**

Department of Commerce, University of Pune, Pune.  
*Second Prize (Post PG) in Commerce, Management, Law Category*  
*AVISHKAR- 2010.*

### **ABSTRACT**

The innovation in the technology brought considerable changes in the life of the people, such as mobile phones, television, life style gadgets. The technological innovations are required to be used in a creative way particularly in an education sector. This will help to bridge the gap between the digital have and have not's.

This paper discusses the experiment carried to evaluate the use of digital audio-visual medium to explain the topic of 'Effective Communication'. The digital film series was produced to provide digital content, which has no geographical limits and time limit, any educational institution, students can use it as per their own convenience, while producing film the researcher interacted with the teachers, and students, proper need assessment was done and based on this dramatized form of presentation were selected. As per the script film series was produced under the guidance of academic subject experts.

The test was conducted in University of Pune, and University of Mumbai. The target group was undergraduate Commerce and Management students. The experiment carried on two levels, first topic was taught them by conventional method of teaching, that is chalk and talk method, after that a pre-watch test was conducted to major the understanding of the concept, Then the film was shown to the same students, then post watch test was conducted to major the difference in understanding level of the students.

The results shows that audio-visual technology help students to understand the subject in a better manner. It helps them to change attitudes, it provides appropriate practical example of the subject. There is shift in pedagogic approach; technology provides solid foundation for the quality education.

**Key words:** Need assessment, educational technology, audio-visual learning material, target audience, testing, feed back, learning objectives.

## Recent Techniques in Management of Employees



**Prof. Archana Ernest**

Sinhgad College of Business Administration & Research, Kondhwa(BK),  
Pune.

*Second Prize (Teacher) in Commerce, Management, Law Category,  
AVISHKAR-2010*

### **ABSTRACT:**

Organizational change is a double edged management tool. Managing change is a Herculean task as it involves changing the organizational culture. It can build a tighter, more focused business-or unleash a backlash of unrest and turbulence. Change is the only constant in organizations today. Change initiatives take many forms and may be the result of internal forces, such as change to an organization's mission or operational structure, or external forces, such as a change in the industry or economy. It is the process of developing a planned approach to change in an organization. Typically the objective is to maximize the collective benefits for all people involved in the change and minimize the risk of failure of implementing the change. The discipline of change management deals primarily with the human aspect of change, and is therefore related to pure and industrial psychology. *Organizational Change...it's tough enough even when you make all the right moves. Make a few wrong ones, and your change management initiative can end up a part of this year's failure statistics.*

Globalization is a prominent affair and everyone talks about it. International dimensions have become a vital part of managing a business enterprise in the Internet-worked global economies and markets of today. When once a manager takes over his job in a large organization as an owner of a small business, he will be affected by international business developments and deal in some way with people, products or services origin is not from home country.

**Key words:** change process, mental models, strategies of change management, and change managers. The research explains the factors that inhibit change in organizations, how to manage change through technique in Management and *CHANGE MANAGEMENT IS SURVIVAL OF THE FITTEST*



## Novel Coupling Agents for Surface Modification of Cenosphere Filled Polymers

**Malhari Bhimrao Kulkarni**

MIT College, Kothrud, Pune

*Second Prize (Teacher) in Engineering & Technology, AVISHKAR-10*

### ABSTRACT

Major environmental issues are now coming to the forefront everywhere with increased public awareness of the human health effects and the possible effects on our global environment. About 75% of India's energy supply is coal based and shall be so for the next few decades. There are about 82 utility thermal power stations to produce approximately 110 million tonnes of fly ash per annum in the Country. Nearly 38% of the fly ash waste is utilized in the Country at present, in various fields including landfills, cement making and concrete product making such as bricks, blocks and tiles, in road making, in filling of the mines. Low Density fly ash which are hollow spherical Aluminum Silicate particles with the size ranges between 10-400 $\mu$ m, with porous wall thickness of 10% of spherical diameter, having bulk density around 400Kg/m<sup>3</sup>, which can be used to make light weight composites. Due to environmental regulations, new ways of utilizing fly ash have to be explored in order to safeguard the environment and provide useful ways for its disposal. One way to achieve this task is to make ash-bearing composites having polymer matrices. However, the use of fly ash as a filler is still not widespread. The main reasons are the weak interfacial bonding between untreated fly ash and polymer, and the low whiteness value resulting in an undesirable appearance to the final product. To overcome these problems, a variety of surface modification technologies, involving addition of novel coupling agents followed by mechanical mixing, have been widely used to make properly tailored interface, which leads to improved toughness without much affecting the strength. In this study, use of novel coupling agents such as Aminostearamide and Polyisobutylene amine (PIBA) have been recommended as a unique and innovative technique in polymer composites.

**Keywords:** Polypropylene (PP), Low Density Fly Ash, Novel Coupling Agents, Aminostearamide and Polyisobutylene amine (PIBA).



## **New Flow Chamber Bioreactor for Artificial Skin and Tissue Engineering Applications**

**Badhe Ravindra V**

Padm. Dr. D. Y. Patil Institute of Pharmaceutical Sciences and Research,  
Pimpri, Pune  
*Second Prize ( Post PG) Medicine & Pharmacy, AVISHKAR-10*

### **ABSTRACT**

India is the only country in the world where fire (burns) was classified among the first 15 leading causes of death. The main cause of burn mortality is Burn Septicemia (Air born microbial infection in burn wounds). There are mainly four degrees of burn out of which third and fourth degree burn are life threatening. The present burn treatment (topical antibiotics, bandages, skin grafts and wound closers) have some or other disadvantages like frequent applications, semi biodegradability, limited body area coverage and prolonged wound healing time. In our work, we developed a modified chitosan based co-polymerised, micro-porous, medicated film on which healthy skin cells can be cultured within few hours and can be directly applied on the burn wounds. This will protect the patient from possible Burn Septicemia and as the film is biodegradable, it will be dissolved in body fluids and healthy skin will take its place. The new flow chamber bioreactor is important for initial skin cell seeding, as it require sterile environment. The bioreactor can be operated with battery system (multiple flow chamber units arranged in series) which is very useful for large scale preparation of skin cell seeded films for large surface burn patients.

**Key words:** Flow chamber bioreactor, Biodegradable scaffold, Artificial Skin, Skin tissue engineering



## **A Comparative Study Of Sattwic, Rajasic And Tamasic Diet In Relation To Mental Health And Anger**

**Susmeeta R. Katarki**

Department of Psychology, Fergusson College, Pune.  
*Humanities, Languages & Fine Arts (P.G), AVISHKAR-2010.*

### **ABSTRACT**

The purpose of the study was to examine whether there lay any differences between those who consume Sattwic, Rajasic and Tamasic diet with respect to mental health and anger. 180 students from various institutions, aged between 20 – 25 years, were administered two scales: State-Trait Anger Expression Inventory (STAXI-2) by Spielberger (1999) and the Mental Health Checklist (MHC) by Mathew and Ram (1999).

One way analysis of variance (ANOVA) and t-test was employed to test the hypothesis. The results of one way ANOVA showed that the three groups, Sattwic, Rajasic and Tamasic differed significantly on mental health and anger. Scheffe's Post Hoc was done to analyze the three groups further. Those who consume Sattwic diet were found to be better on mental health and lower on trait-anger than those who consume Rajasic or Tamasic diet. Those who consume Rajasic diet were also found to be better on mental health than those who consume Tamasic diet. However, no difference was found between these two groups on trait-anger. No significant difference was found between those who consume Sattwic and Rajasic diet on anger-expression/ out and anger-expression/ in. But, Sattwic dieter's differed significantly from Tamasic dieter's on anger-expression/ out and anger-expression/ in. Those who consume Rajasic diet were lower on anger-expression/ out and anger-expression/ in than those who consume Tamasic diet. There was no gender differences found on any of the variables.

**Key words:** Sattwic, Rajasic, Tamasic Diet, Mental Health, Anger.



## **Flood Risk Analysis Of The River Godavari In Maharashtra: Geoinformatics Approach**

**Jadhav Mahadeo Shridhar**

Research Center in Geography, Ahmednagar College, Ahmednagar.  
*Humanities, Languages & Fine Arts (P.G), AVISHKAR-2010.*

### **ABSTRACT**

Flood analysis is a part of applied geomorphology, which causes major problems during these decades. Present research, aims to understand flood of the river Godavari. Changes in hydraulic geometry causes a series of channel adjustment which leads to changes in other variables resulting in channel pattern alteration and the manner in which respond to flood flows.

Part of river Godavari from Trimbakeshwa to Nashik is taken in to consideration for this study. Nashik is situated 40 km downstream from the source and river is flowing in bed rock and alluvial patches. Rainfall at trimbakeshwar is 3 to 4 times greater than Nashik. Two major tributary Gautami and Kayshpi joins the Godavari before Nashik. Bank erosion and urbanization leads the main river to change its course during floods.

The problem of flooding is still a challenge in current scenario .The river Godavari has been experiencing flood during every monsoon that affects properties and lives. High magnitude flood plays an important role in the shifting of main channel, sediment and water discharge of the river Godavari which increase flood risk along the channel.

Geoinformatics is precise technique to analyze paleo, current and future floods. In present study major floods of the river Godavari in Nashik city have been considered, for its effects on residential area. With this study few other sites of agricultural zones, which have been affected by the floods, have also observed. But detail study of these site have note done. As far as the past years, 1976, 2006, 2008, Major floods of the river Godavari have been considered. In flood analysis, two aspects have been observed for detail study-

- 1.Changes in channel morphology
2. Losses

Hydrological data for last 30 years is taken from MERI, Nashik. On the basis of data analysis, field survey, reports of corporation office and discussions with local people, it can be said that flood line of the river Godavari in Nashik encroaching in the city. The results from this study indicated that urbanization is progressively modifying the Godavari River floodplain and its flow.





## **A Study of Impact of Levy Of Income Tax on Select Urban Co-Operative Banks**

**Pranav C. Shirole**

Modern College of Arts, Science and Commerce, Shivajinagar, Pune  
411005.

*Commerce, Management, Law (UG), AVISHKAR- 2010.*

### **ABSTRACT**

Income Tax was levied on Urban Co-operative Banks (UCBs) for the first time with effect from A.Y. 2007-08. Until then; these banks were allowed deduction U/S 80P of the Income Tax Act, 1961. Finance Act 2006 restricted this deduction to Primary Agricultural Credit Societies and Primary Agricultural Credit and Rural Development Banks only. Even in the latest Direct Taxes Code, Sec 85 has denied the deduction to UCBs.

A study of 56 Urban Co-operative Banks was undertaken to ascertain whether the levy of Income Tax on UCBs has adversely affected the amount of profits ploughed back by them, their cash flows and their dividend decisions.

The study revealed that out of the 56 banks, five banks had not disclosed income tax separately, six banks were loss making, six banks had not paid dividend in spite of profits and the income tax burden was on forty one banks.

An analysis of Secondary Data published in Annual Reports of the UCBs for the three years ended on 31st March, 2006, 2007 and 2008, revealed that in the post levy period, there was adverse effect on the amount of profits ploughed back by majority of the banks, there was a sharp increase in cash outflows of some banks and the distributable profits reduced significantly for most of them. Although majority of the banks managed to maintain the rate of dividend, dividend paid as a percentage of distributable profits increased.

In view of above findings, it is recommended that the benefit U/S 80P should be continued, else small and medium sized banks should be excluded from the tax net.



**National Programme of Nutritional Support to  
Primary Education Mid-Day Meal Scheme Issues  
and Challenges for Maharashtra: Study of the  
Scheme in Ahmednagar District**

**Gaikwad Stephan Soloman**

Ahmednagar College, Station Road, Ahmednagar – 414 001.

*Commerce, Management, Law (UG), AVISHKAR- 2010.*

**ABSTRACT**

Maharashtra state is called most progressive progressive state in the country. Mid day meal scheme is also implemented in the state. But in comparison to the states of TN & Gujarat, it is way behind. There are many improvements required in the scheme. The researcher is going to investigate into different angles of the scheme in Maharashtra & suggest the policy measures required to be undertaken to make this scheme more effective & more progressive in the country. 'Universalization of primary education by increasing enrollment retention & attendance & simultaneously impacting on nutrition of students in primary classes'. Major problems for implementing this scheme are identified as : extra work load to teaching staff, irregular food supply. There are few Recommendations for MDM scheme, viz, more budget provision is required, nutritious food be given to the children, direct cash transfer to the children's account.

## **Paradigm Shift to Performance Appraisal System- A Case Study Approach**



**Kamini Singh**

Sinhgad Institute of Business Administration & Research, Kondhwa (Bk),  
Pune.

*Commerce, Management, Law (PG), AVISHKAR- 2010.*

### **ABSTRACT**

Performance Management System is a comprehensive process used to measure, improve, and reward the performance of agencies, programs, or employees. The whole activity was done to find out how the organizations can add value in other personnel activities, such as selecting individuals for training and executive development, for job rotation, and career development. Employee education, training, and development asks how the organization develops the work force via education, training, and on-the-job reinforcement of knowledge and skills to meet the ongoing needs of employees and of a high performance workplace.

Descriptive research methodology was adopted to get accuracy in the project. Various tools like BEI (Behavioral event interview), case study etc. were used to track the competencies of the various positions against the required standards. Plans were developed to fill up or to minimize the competency gap. Areas of improvement were recognized, what steps needed to be taken were also ascertained

**Keywords:** Performance management, competency mapping, acquired proficiency, required proficiency



## **Implimentation of Social Networking on Personal Communication**

*Harboman Rongpi,*

Department of Commerce, University of Pune, Pune-07  
*Commerce, Management, Law (PG), AVISHKAR-2010.*

### **ABSTRACT:**

Social networking has enriched social lives for those separated from families and friends by long distance bring them together despite the physical separation.

This study “The implication of social networking site on face to face communication “is to study the involvement of social net working site in reducing face to face communication.

For this study a questionnaires has been prepared in order to fulfill certain objective of the study.

On the basis of the result of the questionnaires prepared and taking certain consideration, a conclusion has been drawn.



## “लॉटरी व्यवसायाचे समाजावर होणारे आर्थिक आणि सामाजिक परिणाम”

काकासाहेब महादेव टेळे

वाणिज्य विभाग आणि संशोधन केंद्र, पुणे विद्यापिठ, पुणे.

कॉमर्स, मॅनेजमेंट, लॉ (पीएचडी), अविष्कार—२०१०

**प्रस्तावना:-** लॉटरी हा जुगाराचा एक प्रकार आहे. दैववादी प्रवृत्तीला प्रोत्साहान देणारे ते आर्थिक जगतातील एक तंत्र आहे. विशिष्ट प्रकारे एखादया जुगाराच्या खेळात सहभागी होवून नशीबाची परिक्षा पाहण्यासाठी याचा उपयोग होतो. परंतू लॉटरीमध्ये यशप्राप्ती हमखास नाही. तसेच लॉटरीच्या माध्यमातून आयुष्य पालटण्याची कल्पनाही फारशी योग्य नाही. तरीदेखील लॉटरीच्या माध्यमातून हमखास यश व पैसा प्राप्त करण्याची धडपड करणाऱ्यांची संख्या वाढत आहे. म्हणूनच ग्राहकांची मनोवृत्ती हेतू व दृष्टीकोन यांचा हा अभ्यास आहे.

### ➤ अभ्यासाचे स्वरूप:-

प्रस्तुत प्रश्नाचा अभ्यास करण्यासाठी पुणे शहरातील १६० लॉटरीचे तिकिट खरेदी करणाऱ्या ग्राहकांचा अभ्यास करण्यात आला आहे. लॉटरीच्या केंद्रावर जसे उपलब्ध होतील त्याप्रमाणे लॉटरीच्या तिकिट खरेदी करणाऱ्या ग्राहकांची निवड केली आहे.

### ➤ संशोधनाचे उद्देश:-

१. लॉटरी खरेदी करण्यामागे खरेदीदारांची भूमिका समजावून घेणे.
२. लॉटरीच्या माध्यमातून प्रत्यक्षात किती लोकांना लाभ होतो याचे प्रमाण तपासणे.
३. लॉटरी हा आर्थिक परिस्थिती बदल्याण्याचा मार्ग आहे. याविषयी ग्राहकांच्या मतांचा अभ्यास करणे.

### ➤ प्राप्त अनुमान:-

१. लॉटरी नशीब बदलविण्याचा परिश्रमशून्य मार्ग आहे असे बहुसंख्य खरेदीदारांना वाटते.
२. लॉटरीवर सातत्याने खर्च करून देखील अपयश प्राप्त होणाऱ्या ग्राहकांची संख्या लक्षणीय आहे. एकदाही यश प्राप्त न झालेले परंतू नियमितपणे लॉटरी विकत घेणाऱ्यांची संख्या ३५% आहे.
३. गेल्या वर्षभरात एकदा यश मिळविणारे ग्राहक १% आहे
४. इतर कोणतीही गुंतवणूक नकरणारे परंतू लॉटरीत गुंतवणूक करणारे ग्राहक ४०% आहे.
५. लॉटरी हा नशीबाचा भाग आहे हे मान्य करणारे तरीही लॉटरी विकत घेणारे ग्राहक ६५% आहे.
६. लॉटरी विकत घेणारे पण तिला सामाजिक लांछन समजणारे ग्राहक १३% आहे.
७. लॉटरी हा जलद पैसे कमविण्याचा मार्ग आहे यावर विश्वास ठेवणाऱ्या ग्राहकांची संख्या ६३% आहे, तर नशीबावर विश्वास ठेवणारे ग्राहक ३५% आहेत आणि लॉटरी विषयी विशेष ज्ञान असणारे फक्त २% ग्राहक आहेत.
८. लॉटरीवर नियमितपणे आपल्या उत्पन्नाच्या २ टक्के भाग खर्च करणाऱ्या ग्राहकांचे प्रमाण ३१% आहे, तर ५ टक्के भाग खर्च करणाऱ्या ग्राहकांचे प्रमाण ३५% तसेच १० टक्के भाग खर्च करणारे ग्राहक १५% इतके, व १५ टक्के व १५ टक्के पेक्षा जास्त भाग खर्च करणारे ग्राहक १९% आहे.

### ➤ महत्वाचे निष्कर्ष:-

१. लॉटरी व्यवसायाचा विकास वेगाने होत आहे.
२. लॉटरी हा झटपट आर्थिक यशाचा मार्ग आहे.
३. लॉटरीचे दुष्परिणाम लक्षात येवूनसुद्धा लॉटरीबद्दलचे आकर्षण ग्राहकांमध्ये कायम आहे.

### ➤ उपयुक्तता:-

१. लॉटरीच्या दुष्परिणामाविषयी जाणीव निर्माण करून देण्याची प्रचार मोहिम आखता येईल.
२. लॉटरी हा हमखास यश देणारा मार्ग आहे हा गैरसमज दुर करता येतील.
३. समाजापुढे लॉटरीचे होणारे दुष्परिणाम प्रभावीपणे मांडता येतील.



## **Studies on Biosynthesis and stabilization of Nanoparticles using *Tinospora Cordifolia* extract**

**Nirakar Basnet**

Fergusson College, Pune.

*Pure Science (UG), AVISHKAR -2010.*

### **ABSTRACT**

Nanoparticles are usually referred to as particles with sizes ranging from ten to hundred nanometers. A variety of physical, chemical and biological processes have been used to synthesize nanoparticles. However, most of the chemical and physical processes have been found to be capital intensive and energy inefficient. Hence researchers have turned to biological systems for inspiration. A variety of 'green chemistry' alternatives involving living organisms such as bacteria and fungi (Bhattacharya 2005; Sastry et al 2004) and even plant extracts (Shankar et al 2003) have been discovered and exploited in the synthesis of nanomaterials.

In our experiments, we have used extracts of the plant *Tinospora Cordifolia* for the formation and stabilization of silver nanoparticles.

*Tinospora Cordifolia* is a shrub commonly found in India and Central Asia and belongs to the family Menispermaceae. This plant, commonly known as 'gulvel' or 'guduchi' is a component of many Ayurvedic preparations used for the treatment of Rheumatoid arthritis, Diabetes etc. It has a variety of bioactive properties such as anti-inflammatory, immunomodulatory etc. that can be attributed to its various chemical components viz. sesquiterpenoids, diterpenoid lactones, phenolics, carbohydrates etc.

Different extracts (aqueous) of this plant (stem and leaf) were added to aq. AgNO<sub>3</sub> solution. Formation of nanoparticles was followed and detected by UV-VIS spectroscopy. Nanoparticles were characterized by X-Ray diffraction analysis and the approximate size was found to be 12.5 nm. Furthermore the general class of compounds responsible for formation and stabilization of nanoparticles were isolated, identified and confirmed by solvent separation and biochemical tests. They were found to be polysaccharides.



## Waste Leather Degradation: A Boon to Mankind

*Ms. Poojari Vijayalakshmi Ramakrishna*

H.P.T Arts and R.Y.K Science College, Nashik-5

*Pure Science (PG), AVISHKAR- 2010*

### ABSTRACT

Leather industry is one of the major polluting industries because it has an adverse impact on the environment. Tannery generates huge amount of solid wastes as fleshing, chrome shaving, skin trimming and hair. This waste contains protein as the main component in addition to heavy metals such as chromium, arsenic which are carcinogenic. The solid wastes treatment chemically is not cost effective since it is highly costly.

The bacteria such as *Bacillus subtilis* isolated from dumping ground shows high capacity of degrading leather waste. *Bacillus subtilis* isolate has been reported to decolorize azo dyes from leather industry wastes. We have isolated *Bacillus subtilis* strains from the dumping ground soil samples. Our work focuses on degradation of leather waste along with the dye decolorization using our isolates so as to control pollution due to leather industries. The degradation of waste leather by the standard strain of *Bacillus subtilis* ATCC 6633 and the isolates was indicated by increase in the optical density and decrease in dry weight of the waste. We are also aiming at developing the dynamic economical consortia of microbes to address the issues of pollution which may help the world to overcome the hazardous effects of dyes.

**Key words:** Leather; Tannery; Waste; *Bacillus subtilis*; Azo dyes



## **ZnO Nanorods by Spray Pyrolysis Technique for Gas Sensing: Synthesis to Application Approach**

**Ganesh E. Patil**

Arts, Commerce and Science College, Nandgaon, Dist: Nashik 423 106.

*Pure Science (Post PG), AVISHKAR- 2010.*

### **ABSTRACT**

ZnO thin films were deposited by spray pyrolysis technique (SPT) using zinc oxide hydrate aqueous solutions onto glass substrates at growth temperature 350 °C. The films were characterized by X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM), transmission electron microscopy (TEM) and UV-vis spectroscopy. The deposition of thin film results in a layer comprising well-shaped hexagonal ZnO nanorods with diameter of 90–120 nm and length of up to 200 nm. XRD shows strong c-axis orientation of ZnO being in accordance with the FESEM study. Deposition of nanorods was successful using SPT with grains in size around 100 nm. The gas sensing performances of these films for various gases were tested. Films showed highest response to H<sub>2</sub>S (100 ppm) gas at 300 °C temperature with poor responses to others. The quick response and fast recovery are the main features of this sensor.

**Keywords:** ZnO thin films, SPT, nanorods, TEM, H<sub>2</sub>S gas sensor.



## **Neutron Activation Analysis and Atomic Absorption Spectroscopy: Powerful Tools for the Elemental Analysis of Indian Ayurvedic Formulations used in the Treatment of Different Diseases**

**Dr. Pardeshi B. M**

Baburaoji Gholap College, Sangvi, Pune-27.

*Pure Science (Teacher), AVISHKAR- 2010.*

### **ABSTRACT**

Medicinal herbal formulations prescribed for specific treatment purposes were purchased from markets and were analyzed by **Instrumental Neutron Activation Analysis (INAA) using  $^{252}\text{Cf}$  spontaneous fission neutron source** and the induced activities were counted by  $\gamma$ -ray spectrometry and Atomic Absorption Spectroscopy (AAS) techniques using Perkin Elmer 3100 Model ) for the measurement of major, minor and trace elements.

**15 essential major, minor and trace elements** elements Al, K, Cl, Na, Mn by **INAA** and Cu, Co, Pb Ni, Cr, Ca, Fe, Zn, Hg and Cd by **AAS** were analysed from different Indian Ayurvedic Formulations.

A critical examination of the data shows that there is no definite trend in the concentration of these medicinal formulations. The elements Ca, K, Cl, Al and Fe are found to be present at major levels in most of the samples while the other elements are present in minor or trace levels. The elemental concentrations in different medicinal formulations are discussed.

**Keywords:** Instrumental Neutron Activation Analysis, Atomic Absorption Spectroscopy, Ayurvedic formulations, Trace Elemental Analysis.



## **Production Of Algaeoleum As A Non-Conventional Diesel Source**

**Yeole Sameer Dilip**

HPT Arts & RYK Science College, Nasik-422005  
*Agriculture & Animal Husbandary (PG), AVISHKAR -2010.*

### **ABSTRACT**

Renewable transport fuels are necessary for environmental & economic sustainability. In recent days large scale bio-diesel production from edible oil seeds has put a burden on edible food stock. Algae have emerged as one of the most promising source for bio-diesel production. Bio-diesel is biologically degradable & contribute to solve the problem of air pollution. Using of bio-diesel reduces CO<sub>2</sub> & NO<sub>X</sub> emission to considerable amount. This study was undertaken to know the proper trans-esterification, amount of algaeoleum production (ester) & physical properties of bio-diesel. In this process of bio-diesel production, oil extraction from algae was carried out. Then oil was trans-esterified by using methoxide solution. The biomass (semisolid waste) remained after oil extraction from algae can be used in ethanol production. The byproduct glycerol obtained from trans-esterification process can be used for soap production.

**Keywords:** Algaeoleum, algal oil, ester, bio-diesel, trans-esterification



## **Bioconversion: A Tool To Enhance The Antioxidant Activity Of Grapes Juice**

**Dushing Yogesh Dushing**

Department of Botany, Fergusson College, Pune-04.  
*Agriculture & Animal husbandry (Post PG), AVISHKAR- 2010.*

### **ABSTRACT**

The aim of present study was to enhance the antioxidant activity of grapes juice by using commercially available enzymes fungal tannase. Fruit juice without addition of enzyme was served as control while added as test. Different concentration of enzyme powder was added to fruit juice and incubated at room temperature for 12 hours. The antioxidant potential was assessed by free radical scavenging activity using 2,2-diphenyl,1-picrylhydrazyl (DPPH) assay. The results clearly indicate that tannase enzyme added fruit juice shows enormously increase in antioxidant activity as compared with control with aforesaid methods. This difference in antioxidant potential may be due to bioconversion of poly-phenols into mono-phenols.

**Key Words:** *bioconversion, grapes juice, antioxidant.*



## Wind Power Generation Using Vertical Axis Wind Turbine

**Ajay Malshe**

MIT College of Engineering, Pune.  
*Engineering & Technology (UG), AVISHKAR- 2010.*

### ABSTRACT

Wind is a source of energy. Harnessing of wind for power generation is effectively used by engineers. Power generation from wind is by far the best possible option and the first in the use of alternative energy sources which is the need of the day. There have been load shadings in many areas of country due to heavy demands of electricity. To meet the demand of load shadings of power generation there should be small sized wind power plants, which can power individual buildings, societies and offices. We have thought of such a solution to develop vertical axis wind turbine.

Our project is sponsored by company “**SHREE DIESEL SERVICES, PUNE**”. We are developing wind machine which can generate power up to 1.5 to 2 KW. This is to be installed on roof top of SHREE DIESEL SERVICES, manufacturing facility. We will be developing this as a prototype. We have designed helical, s-type, fan type blades. These turbines are manufactured using FRP and Aluminium sheets respectively. We have tested the prototypes in natural and artificial conditions. In natural conditions we are able to generate designed power of about 50 watts, 250 watts and 500 watts respectively. Now we will be optimizing using different types of blades. We have developed a test setup for the installation of wind turbine. After the optimization of blades wind turbine will be coupled to a generator or a battery charging alternator.

## **Experimental Study of Fiber Reinforced Blended concrete Beams in Shear**

**Sumant Nivarutti Shinde**

MAEER's Maharashtra Institute Technology, Pune-38.  
*Engineering & Technology (PG), AVISHKAR- 2010.*

### **ABSTRACT**

The acceptance of fiber reinforced concrete by construction industry has lead to a number of developments. Among these developments, metallic fibers, polymer fibers, mineral fibers and naturally occurring fibers are used to modify properties of concrete and mortar.

The use of metallic fibers enhances compressive, tensile & flexural strength of concrete. The metallic fibers have typically high modulus and high strength. These fibers contributes the improvement in ductility as well as strength of the concrete .

Fly ash conforming to I.S. with high fineness, low carbon content, results in reducing the heat of hydration of cement with reduction in drying shrinkage. Fly ash contributes the strength of concrete due to its pozzolanic reactivity and is used as a secondary blend to replace Ordinary Portland Cement in concrete.

The randomly distribution of fibers in the concrete beams bridges the cracks in all directions, which helps in increasing the shear capacity. The aim in present work is to investigate the influence of shear span depth (a/d) ratio on the shear strength of concrete prepared using fly ash and the steel fibers where 'a' is shear span ,distance between load and nearest support and 'd' is depth of beam measured from extreme compression fibers to C.G. of flexural tension steel.

Experimental programme is planned to find out the feasibility of use of steel fibers in fly ash blended concrete. The tests such as tensile strength test, compressive strength test will be conducted according to IS norms.





## **A Novel Reactive Power Pricing Structure for Hydroelectric Power Station in Condenser Mode Operation under Open Access Conditions**

**Mrs. Geetanjali Abhijit Vaidya**

PVG's College of Engineering, Pune.

*Engineering & Technology (Teacher), AVISHKAR- 2010.*

### **ABSTRACT**

This project deals with reactive power pricing structure for hydroelectric generating station for condenser mode operation. In the present restructured environment, the reactive power pricing structure for such a case is not yet developed. Hydroelectric generators operating in condenser mode provide major reactive power support to the system and help to maintain system security and reliability. It is a necessity to develop reactive power pricing structure for these units under open access conditions. Different cost components for reactive power pricing when a hydro generator operates in condenser mode are identified. These are capital cost component, changeover cost component, cost due to additional changeovers and cost component related to number of service hours in condenser mode. Changeover cost component includes cost of water lost and cost of wear and tear related with the changeover. Cost component related to number of service hours includes cost of energy consumed, opportunity cost and operation and maintenance cost. In depth analysis and computation of all these components is carried out. Mathematical model is also formulated for these cost components. A case study for Koyna hydroelectric power plant in Maharashtra is considered where units operate substantially in condenser mode. Based on the above methodology, reactive power pricing structure for Koyna hydroelectric power plant is formulated and computation of monthly reactive power payment is carried out. Nowadays, in India, more and more hydroelectric plants are being put into condenser mode for reactive power support service on regular basis and therefore payment procedure for reactive power support is the need of hour.



## Use Of Plant Essences In Making Natural Bath And Body Products

**Mr. Dipen S. Parande**

Fergusson College, Pune.

*Medicine & Pharmacy (UG), AVISHKAR- 2010.*

### ABSTRACT

Phytotherapy is a field of pharmacognosy which deals with the study of the plant extracts as medicines or health promoting agents. Aromatherapy is an alternative form of medicine based on the topical application or inhalation of essential aromatic plant oils to maintain and promote physical and psychological well being. The purpose of this research was to extract aromatic plant essences, investigate their properties and use them in making hygiene and skin care products viz bath soaps, liquid handwash and a body lotion. The plant essences were extracted using soxhlet apparatus by the method of steam distillation. The plant essences were analysed for their antioxidant properties using DPPH (2,2 Diphenyl, 1- Picryl Hydrazyl) reagent. The half maximal inhibitory concentration ( $IC_{50}$ ) was then calculated. They were also examined for their antimicrobial activity against *Staphylococcus aureus* and *Candida albicans* using the well plate and disc plate methods. These aromatic extracts were further used in making commercial products. The application of these products will efficiently fight infections, provide aroma therapy effects, promote healthy skin and have refreshing effects on body. The most notable fact is that the products do not contain animal fats and harmful chemicals like parabens.

**Keywords:** Plant essences, Antioxidant property, Antimicrobial Activity, Commercial Products



## **A Novel Ecofriendly Method To Remove Phenol From Industrial Effluent**

**Dhanashri Nevgi**

Fergusson College, Pune-411004  
Pure Sciences (UG), Avishkar-2010

### **ABSTRACT**

The prevailing trends towards rising population, increasing urbanization, rapid industrialization and spread of more water intensive lifestyles are making water resources scarce and polluted. Phenolic compounds are found in wastewaters of various industries such as textile, petroleum, refining, plastics etc. Due to the toxicity (carcinogenic nature) of these compounds to aquatic organisms and humans it is important to remove phenols from contaminated water before discharge into any natural water body. In this study the removal of phenolic contaminants will be undertaken biologically by using peroxidase enzyme. This enzyme will be extracted from various natural sources like radish, carrot, beetroot, broccoli and soya bean as well as micro organisms such as *Pseudomonas spp.*, *Bacillus spp.*, *Staphylococcus spp.* Peroxidases catalyze the oxidation of phenols by hydrogen peroxide resulting in the formation of water insoluble polymers which can be separated by coagulation, sedimentation etc. The prime objective of the project is to develop an ecofriendly, economical and effective biological method of removing phenolic pollutants from waste water. The most effective peroxidase enzyme will be formulated in the form of bricks, tablets, capsules, solution etc. for industrial application for efficient removal of phenol from the industrial effluent.

**Keywords:** Peroxidase, Hydrogen peroxide, Polymer, Phenol



## Novel Conversion of Multistep Reactions into Rapid One Pot MCr Under Mwi for Synthesis of Potentially Bioactive Heterocycles

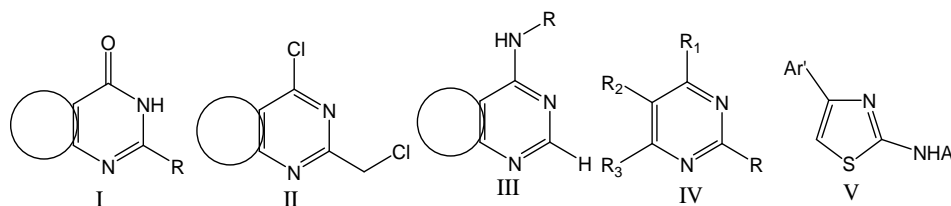
**Dr. Kishor S. Jain**

Sinhgad College of Pharmacy, Vadgaon (Bk.) Pune- 41.  
*Medicine & Pharmacy (Teacher), AVISHKAR- 2010.*

### ABSTRACT

New Drug Discovery Research holds key position in medicinal chemistry and health sciences. To discover a new drug approximately 1500 million US \$ and 15-20 years required. About  $10^4$ - $10^5$  new compounds need to be synthesized. In today's world speed is the essence for success and both synthesis and biological testing are automated and high throughput. Microwave irradiation (MWI) has really turned out to be a boon to organic synthesis in recent 10 years. Reactions can be completed in few minutes under MWI and the technique also falls under **Green Chemistry**.

The present work is a successful attempt for the ultra-rapid one pot MWI based synthesis of a variety of heterocycles (**I**, **II**, **III**, **IV**, **V**) listed below



The compounds have exhibited great potential for antihyperlipidemic (**I** & **II**), antitumor-anticancer (**III**), antifungal & antimicrobial (**III** & **IV**) and antifungal (**V**) activities.

This methodology can be successfully made adaptable to automated parallel synthetic protocol. The reaction rates for entire multistep synthesis have been reduced from 6 – 48 hrs to just 10 -50 minutes! This has been achieved by judicious selection of reactants, reagents, solvents, reaction conditions and MWI technique.

**Keywords:** MWI, One Pot, Green Chemistry, Pyrimidines



## **Anaerobic Bioreactor Landfill For Bio-Stabilization And Green Renewable Energy Generation From Municipal Solid Waste**

**Sandip Tanaji Mali**

Sinhgad College of Engineering, Vadgaon (Bk.) Pune  
*Engineering & Technology ( Post PG ) , AVISHKAR- 2010.*

### **ABSTRACT:**

The problem of MSW Management (MSWM) has acquired alarming dimensions in India, especially over the last decade. The present study aims at accelerating the sequential phases of waste stabilization by combining two perspectives. The first one by Americans which attempts to maximize landfill gas production and the second approach by Europeans which focuses on the achievement of Final Storage Quality (FSQ) status of residues within a generation time frame. Characterization study carried for twelve months at landfill site of Pune city (located at *Urali Devachi*) shows that major portion of MSW is compostable matter (70%). Simulated anaerobic bioreactors (laboratory scale 20 lit, trial 74.22 lit & pilot 84.82 lit) were used to stabilize the solid waste. The experimentation was carried out on different combinations of waste (organic and mixed waste) and the effects of operating conditions (aeration at starting of the process, variation in density, mixing of gravel, and addition of culture, anaerobic digested sludge) were observed in order to achieve FSQ of residues as well as comparative analysis for gas generation. The results of the experimentation revealed that it was possible to achieve biological stabilization within 268 days with the characteristics of leachate almost meeting the effluent standards mentioned in MSW 2000 rules and the gas generation rate recorded was 143.3 lit per kg of dry waste.



## Identification of Mutant Specific DNA Bands from Soyabean for Scar

**Kazi Tahsin**

HPT Arts & RYK Science College ,College Road Nashik 05.

*Pure Sciences (UG), AVISHKAR- 2010*

### **ABSTRACT-**

Soybean (*Glycine max.* L. Merr.) occupies a coveted place among the oilseed crops, being cultivated all over the world is an economically important leguminous crop for oil, feed and food products. It contains protein (average 40%) and oil (average 20%).The present day soybean cultivars are derived from narrow genetic base. Inducing mutations has widely been accepted as a supplementary approach in the crop improvement programmes and mutagenesis has been an excellent tool for creating variability. In present work 13 stable phenotypic mutants selected from M4 generation were used for the molecular characterization by RAPD analysis.. Total 30 mutant specific bands were found with RAPD primers. Primers OPK-3, OPN-19, 20 had markers that were specific to many mutants. Specific bands obtained with primers with OPK 3,14, OPN-5, 8, 9,14,15,19 and 20 can be converted to sequence characterized amplified regions (SCARs), useful for gettingmutant specific profile. . The study revealed that RAPD markers can be used to assess extent of variability in them and characterize them with specific bands.



**Modified Cultivation Techniques for Optimizing  
Production of Tuberos Roots of Shatavari  
(*Asparagus Racemosus Willd.*)**

**Subhash Sadhu Deokule**

Dept. of Botany, University of Pune.

*Agriculture & Animal Husbandry (Teacher), AVISHKAR- 2010.*

**ABSTRACT -**

In the present investigation, a modified cultivation techniques of age old medicinal plant (Shatavari) has been undertaken to enhance the yield in which black soil used as a control, black soil mixed with red soil + FYM + Green manure. It is observed that black soil mixed with red soil + FYM + Green manure has been showed good results for the maximum production of Shatavari roots as well as benefit cost ratio also doubled.

**Key words:** Shatavari, black soil, FYM, Green manure





## **Role of Colleges in the Rural Development: Bhivarewadi a Case Study**

**Dr. Tushar Shitole**

Head, Department of Geography, Prof. Ramkrishna  
More College, Akurdi, Pune 44

*Humanities, Languages, Fine Arts (Teacher), AVISHKAR- 2010.*

### **ABSTRACT**

The Concept of Rural Development in India has changed in the past three decades. Until 70's RD was synonymous with agricultural development. In 80's a strategy designed to improve the economic and social life of a specific group of people – the rural poor. Concerns were deepening rural poverty, changing concept of development Emergence of diversified rural economy. Today's inclusive Rural development goes beyond growth, income and output, quality of life – health, education, nutrition, living conditions and reduction in gender equalities.

In today's rural development colleges can play important role by applying knowledge, resources and youth. College students of various departments along with their faculties and resources can do remarkable work in rural development.

The government of India and government of Maharashtra continuously try to develop the villages. As the  $\frac{3}{4}$  of the Indian population live in villages, hence government introduced many schemes for rural development. Urban people have least contact with villagers; therefore it's necessary to visit the village to collect the data which should be use full for government planers and schemes to solve the problems. Government applied various schemes for villages to removal of disparities between rural and urban in case of social, economics and cultural set up. GIS is new technique applied now in Geography, which help planning, constructions, and research.

Main objectives of this project is to understand physical, socioeconomic and cultural aspects of the village, to elevate the existing land use pattern of the village, to study the morphology of the settlement, living status of village and preparation of village information system by applying GIS technique. Create social and environmental awareness amongst villagers and to suggest other income sources to villagers.



Mr. Gopal Deore, Winner National level Research Convention Anveshan-2010 Discussing with Dr. Ranganathan, Chairman, Peer committee team (NAAC) & other members at University level Avishkar-2010.

Hon'ble Vice-Chancellor Dr. Raghunath Shevgaonkar, addressing the winner team Avishkar-2010.



Hon'ble Vice-Chancellor Dr. Raghunath Shevgaonkar, winner team with news reporters.

Dr. Mohan Waman, O.S.D, B.C.U.D, Prof. Vikas Kandekar, Team Manager, Avishkar-2010 with winner team of State Level Avishkar- 2010 on University Foundation Day.





Dr. Ranganathan, Chairman, Peer committee team (NAAC) sharing his views at University level Avishkar-2010.

Inauguration of Avishkar 2009-10 Abstract book at University level Avishkar-2010.



Hon'ble Vice- Chancellor Dr. Raghunath Shevgaonkar monitoring the arrangement of University level Avishkar-2010 along with Dr. W. N. Gade, Director, B.C.U.D; Dr. Sambhaji Pathare, Director Student Welfare; Dr. Mohan Waman, OSD, B.C.U.D. & other delegates.

Dr. Kakasaheb Mohite explaining Pune pattern of AVISHKAR to Peer committee members & Hon'ble Vice- Chancellor Dr. Raghunath Shevgaonkar at University level Avishkar-2010.







## पुणे विद्यापीठ गीत

ज्ञान बनो कर्मशील, कर्म शानवान

पुण्यमयी दे आम्हा अक्षर वरदान  
ज्ञान बनो कर्मशील, कर्म शानवान

जातिभेद, धर्मभेद, वंशभेद दूर  
लाख लाख कंठांनुनि हाच एक सूर  
करुणेच्या चरणांशी नत हो विशान

माणुसकी धर्माचा अर्थ जाणतो  
श्रमनिष्ठा हें पवित्र तीर्थ मानतो  
हृदयांनुनि समतेचा निर्भय अभिमान

सेवेतच मुक्ती ही मंगल दीक्षा  
न्यायास्तव जागृति ही सखपरीक्षा  
हें विश्वचि प्पर अमुचे मंत्र हा महान

मंगेश पांडुरंग





Participant of University of Pune explaining his project to Hon'ble Medical Education Minister Dr. Vijay Kumar Gavit & Hon'ble Vice-Chancellor Maharashtra University of Health Sciences Dr. Arun Jamkar at State level Avishkar- 2010.



Hon'ble Vice- Chancellor Dr. Raghunath Shevgaonkar & Dr. W.N. Gade, Director, B.C.U.D with the Dr. Ranganathan, Chairman, Peer committee team (NAAC) at University level Avishkar- 2010.