ANNEXURE-III

UNIVERSITY GRANT COMMISSION

BAHADUR SHAHA ZAFAR MARG

NEW DELHI-110002

Annual Report of the work done on the Minor Research Project.
(Report to be submitted within 6 weeks after completion of each year)

1. Project Report No.1/2/3/final : **First Annual Report**

2. UGC Reference no. : **File No..47-1323/10(WRO)**

3. Period of Report : **From 15-10-2010 to 14-10-2012**

4.Title of the Research Project : **Study of Photochemical Analysis And Antimicrobial Activities of Some Important Medicinal Plants used in Folklore Remedies in Chandrapur and Gadchiroli District of Maharashtra**

5. a) Name of the Principal Investigator : **Dr.Vijay S.Wadhai**

b) Deptt. And University/College where work has progressed: Department of Microbiology , Sardar Patel Mahavidyalaya, Chandrapur. RTM Nagpur University, Nagpur.

6. Effective date of starting of the Project: **16/10/2010**

7. Grant approved and expenditure incurred during the period of the report-

a) Total amount approved- **Rs.1,20,000 (Rupees One Lakh Twenty Thousand)**

i. Brief objective of the project ---- Brief objectives of the present study are as follows.

The problem of microbial resistance is growing and the out look for the use of antimicrobial drugs in the future is still uncertain. Therefore action must be taken to reduce this problem. For example, to control the use of antibiotic, devlop research to better understand the genetic mechanism of resistance and to continue studies to develop new drugs either synthetic or natural. The ultimate goal is to offer appropriate and efficient antimicrobial drugs to the patient.

About 80% of individuals from developed countries use traditional medicine which has compounds derived from medicinal plants. Therefore such plants should be investigated to better understand their properties, safety and efficacy.

The effective plant constituents can combat human and plant pathogenic bacteria, fungi and viruses without toxic side effects and environmental hazards. It is because of these reason that search for plant products having antimicrobial properties has intensified in recent years.

Summary of the Work done

Survey & Sample Collection

Drugs in traditional medicine consist of formulae prepared from various animal and vegetable substances. Medicinal plants are being widely used in India either directly as folk medicines or medicaments of different indigenous systems of medicine like ayurveda, sidha and unani.

The custom of using herbs for curing various diseases is prevalent in the Chadrapur and Gadchiroli tribal district, therefore to collect the information and plant material for investigation several trips were made to the tribal localities in the district. During these visits contacts were established with the native healers, Gond communities and common folk who have knowledge of the theraupetic value of plant. Because of the fact that majority of the population in the rural areas is illiterate, oral interviews were held. Through interviews and discussions, information about plants used for various diseases commonly afflicting them was gathered.

Preparation of Plant Extract

Extracts of the selected plants prepared by using Soxhlet extraction method. For preliminary screening of plants for antimicrobial activity the extract were prepared in water.

Antimicrobial Testing

Preliminary antimicrobial screening of plants was performed by the stroke method. In this method 8 ml of nutrient agar was mixed with 2 ml of plant extract. This mixture was poured into petridish under aseptic condition and allowed to cool for 2o minutes at room temperature. For inoculation of the microorganism small stroke culture were applied to the surface of the agar medium, the plates were incubated at 37 ^{o}C for 24 hrs after which the results were recorded.

Test Organisms

The test organisms used includes *Escherichia coli, Bacillus subtilis, Ps.aeruginosa, Proteus vulgaris,Bacillus cereus and , Staphylococcus aureus*

Plant specimens

Sr. No	Plant Species	Local Name	Medicinal Use
1	*Aegle marmelos*	Bel	Fruit is used as popular remedy in chronic dysentery
2	*Aloe vera*	Korphad	The plant is useful as stomach tonic in small doses & in large doses , it is purgative
3	*Lantana camara*	Ghaneri	Against flu, colds, coughs, fevers, yellow fever, dysentery and jaundice.
4	*Holorrhena antidysentrica*	Kuda	Treatment for dysentery and chronic
5	*Ocimum sanctum*	Tulsi	Common colds, headaches, stomach disorders, inflammation, heart disease, various forms of poisoning, and malaria

6	*Caraca Papaya*	Papaya	Digestive problems and intestinal worms
7	*Biophytum sensitivum*	Lajalu	Used as a tonic, stimulant and in the treatment of stomachache, diabetes and asthma
8	*Ochna gamblei*	Ragat Rohan	Bark is used in dysentery & various abdominal problem
9	*Calotropus gigantean*	Rui	Fevers, rheumatism, indigestion, cough, cold, eczema, asthma, elephantiasis, nausea, vomiting, diarrhea
10	*Phylantus niruri*	Bhui Awla	Antidibetic, antimalerial,analgesic

Lantana camara, Holorrhena antidysentrica , Ocimum sanctum , Ochna gamblei shows antimicrobial activity against *S.aureus, E.coli ,*

Aloe vera, Phylantus nirnui, Biophytum sensitivum showed a very good antimicrobial activity against *E.coli and S.aureus. Calotropus gigantean , Aegle marmelos* showed antimicrobial activity against *S.aureus and Escherichia coli*

In present project work, the Antibacterial activity and phytochemical analysis of methanol, aqueous, petroleum ether extract of *Phyllanthus niruri , Calotropis gigantean, Lantana camara , Holorrhena antidysentrica Aegle marmelos, Ocimum sanctumi, Aloe vera, Carica papaya, Biophytum sensitivum, Ochna gamblei* was performed. It has been found that the products of natural origin can be still major source of therapeutic agents because of the presence of biologically active compounds present in it. The antibacterial activity of plant is due to the phytochemical present in it. The phytochemical test were performed according to standard procedures, on the basis of presence and absence of colour it indicate the presence of the respective compounds.

The present study revealed the presence of Alkaloids, Tannins, Steroids, Triterpenoids, Saponins, Gums and mucilage's, Flavonoids, and the antibacterial activity of leaves extracts of *Calotropis gigantea* was tested against pathogenic microorganism, such as *Staphylococcus aureus ,Escherichia coli ,Pseudomonas aeruginosa, Bacillus cereus.* All this

organism were maintained on nutrient agar slants. All plantswere collected from natural habitats of chandrapurand Gadchiroli districts. The plant parts were washed properly, dried in shade, then it was powdered and this fine powdered leaves were soaked in distilled water for 24 hours, powdered leaves were also soaked in petroleum ether and Methanol and kept for 7 days at room temperature. Then it was filtered and evaporated in water bath to form residue which was dissolved in dimethyl sulfoxide (DMSO) for preparing extract stock.

Antibacterial activity was carried out by agar well diffusion method. The broth culture were prepared and 0.1 ml of broth culture was spreaded on the Muller Hinton agar plates and kept for 10min to diffuse culture in media, Then the well were made by gel borer in Mueller Hinton agar plate. The extract stock was poured into the wells and and kept in refrigerator for some time and after this plates were kept for incubation in incubator at 37^0c for 24 hours. Zone of inhibition was measured .The Zone of inhibition was regarded as presence of antibacterial action.

In present study we have found that this plant contains various biologically active components which are responsible for antibacterial activity of that plant, from the phytochemical analysis we have found that this plant contains flavonoids, gums and mucilage's, saponins, alkaloids, tannins, triterpenoid and steroids and this bioactive phytochemicals can be used for making various theraupeutics. Thus we can think about *Calotropis gigantea* as an alternative to modern and costly medicines.

From this study it can be concluded that leaves of plants used in study of many secondary metabolites and are efficient against common diseases causing pathogens.This research work states that the presence of alkaloids, cardiac glycosides, terpenoids, saponins, tannin, flavonoids, andsteriods in the ethanolic extract of *Aegle marmelos* were responsible for its antimicrobial activity. These compounds exhibit a maximum zone of inhibition against *Escherichia coli, Pseudomonas aeruginosa* and *Bacillus subtilis, w*hen compared with the control drug vancomycin. Moreover, this study shows that some plants show much promise in the development of phytomedicines having antimicrobial properties. In this endeavour, traditional herbal medicines must perforce be granted the benefits of modern science and technology to serve further global needs. The drugs derived from herbs may have the possibility of use in medicine because of their antibacterial activity.

The result of study indicated that the parts of plants used in study contain some major bioactive compound that inhibits the growth of microorganism thereby proving very effective as alternative source of antibiotics. The compounds identify in this study shows that they could be responsible for activity observed. Therefore further studies would be carried out to identify the specific compounds and elucidation of the structure.

Dr.V.S.Wadhai

Principal Invistigator