

An environmental and sociocultural study on the Mandargiri hills of Angul district, Odisha, India

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Abstract

Mandargiri hills are situated in the heart of Angul district of Odisha near to NH 42 between Lat: 20° 47' 15" to 20° 49' 00" and Long: 85° 1' 30" to 85° 3' 30" E [Ref: Topo sheet no: 73 H-1, 1972-73]. The stupendous Mandargiri hill is of height as 420mt. from MSL. The mountain has 2 parts having been divided by a narrow line; one part is known as Mandargiri and other as Kalima. The Legal Status of the area is MANDARGIRI-KALIMAL RF as per Govt. order no 377/81, dt. 1.6.1981 under section 21. Geographical area as per notification is 586.730 ha., as per GIS survey (working plan) is 606.995 ha. and as per toposheet the area is 650 ha. The length of boundary line is 10.71 km. The forest type is 5/D S2 (i.e. Northern Tropical dry deciduous forest) according to Padhi, 1977. The degradation stage is 5B / C2 (Biotic interference leading the site for dryness and deforestation). It comes under DMU / Forest Division of Angul, FMU / Forest Range of Purunagarh and Forest Section of Town section. The average slope is 30% with igneous rocks. It is 7 km distance away from NH 42 (Angul to Sambalpur NH) and diversion of 2 km to left. The predominant wind directions are Monsoon: from SW & NW, Post-Monsoon: from NW & NE, Winter: from NW & NE and Pre-Monsoon: from SW & S. The climatology indicates that on an average rain fall occurs almost every month and April / May invariably gets good pre-monsoon showers that range from 20 to 344 mm with average of 98 mm followed by high velocity wind and thunder storms. Usually monsoon breaks in the third week of June and continues up to end of September. The average number of rainy days in a year is 100, of which 70 are confined to the period between June and September. Summer months are very hot as the maximum day temperature varies from 45°C to 47°C in the months of May and June but drops appreciably with the onset of monsoon. When the monsoon withdraws in the month of October, the daytime temperature remains the same however the nights become cooler. Gradually both day and night temperatures fall. The coolest month is December when temperature at night varies between 6°C and 11°C. The pollution parameters i.e. RPM, SPM, SO₂ and NO_x in the region are having the maximum and minimum values (µg/m³) as (49, 97), (106, 191), (<10, 15) and (30, 42) respectively. The whole hill was covered with dense forest but due to lack of protection, large scale felling of trees went on since 1970 at such rate that the forest cover was all but going to be lost forever. However in 1995, the people of the nine surrounding villages i.e. Tumuni taken in OFSDP, Bhaliapal taken in OFSDP, Saharaguda taken in OFSDP, Saradhapur taken in OFSDP, Sabalabhanga taken in OFSDP, Shyamasundarpur taken in OFSDP, Chandrabahal taken in OFSDP, Musapalli [FDA and taken in CAMPA] and Panchamahala (not taken in any project) formed the Mandargiri Surakshya Manch and looked after the forest. Now the hill boasts of a thick sprawling green and many useful trees and medicinal plants. Though the activities are not regular in nature, there are few activities carried out by the Mandargiri surakshya Mancha with the help of FES, Angul. The activities are: Cycle rally for forest fire control, awareness meeting, Annual celebration of Mancha for last three years, Essay and debate competition in schools etc. Meeting of Mandargiri surakshya Mancha is held on last Sunday of every month on rotation basis in different villages listed above. The area was frequently visited throughout the study year, 2009. The plant samples were collected from different locations and species were identified following the standard procedure by the help of regional and national flora (Saxena and Brahmam, 1996 and Hooker, J.D., 1872-97) and the herbarium of IMMT, Bhubaneswar. Perceptions of local people on the location and richness of availability of plant resources was taken into account while enumerating the species. In total one hundred and fifty plant species were documented in the hills. Being nearest to Angul town, the place can have potential demonstration effect, Cultural effect (four old temples around the hill), three caves, holds one of the catchment of Derjang irrigation project (life line of Angul for water), religious belief / faith (people of Angul and nearby districts are coming to collect herbs for human and domestic animals), excellent view and landscape. So the hill is one of the important sacred grooves and a natural heritage for biodiversity conservation and management of the region.

Key words: Mandargiri, Angul, OFSDP, Derjang, Biodiversity

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Serum profiles among middle aged male smokers: a preliminary study

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Abstract

Smoking is an escalating health problem especially in developing countries such as India. Cigarette smoking is a known risk factor for peripheral, coronary and cerebral atherosclerotic vascular diseases. Cigarette smoking leads to the uptake of many hazardous compounds and their metabolites extracted from burning tobacco. Total 15 active male smokers those who were engaged in Bus Driving in RCST without any other illnesses and age matched male healthy control subjects (20) with similar socio-cultural background were assessed for dietary habits, physical activities, smoking and alcohol consumption. Standard methods were adopted to check the lipid levels. The data were analyzed statistically. Apo-lipoprotein changes occur earlier than cholesterol level; it would be advisable to include apo-lipoprotein concentration in lipid panel. Further studies are warranted to establish the role of apo-lipoprotein concentration in patients on lipid lowering therapy as a guide for response to therapy and genomic factors in apo-lipoprotein synthesis. Cessation of smoking not only reverses lipid changes but also vascular diseases, especially coronary artery disease (CAD). Our study concluded that changes in Apo-A1 and Apo-B were more significant when compared to HDL and LDL cholesterol among smokers. After reviewing the double risk for smokers (smoking and altered lipid profile) efforts may be made to introduce smoking cessation program. Since our study is the beginning, further continue research required to draw clear cut conclusion.

Keywords: Control Subjects, Demography, Serum Profile, Statistical Analysis

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***Agrobacterium rhizogenes* mediated gene transformation in *Tagetes erecta* and study of factors affecting growth of hairy root culture.**

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Abstract

Gene transformation is an advance technology mainly used for production of hairy root culture, production of secondary metabolites and in several other applications in molecular farming, regeneration of the plant, phytoremediation etc. In concern to transformed root technology promoting organic farming a strain of the bacterium *Agrobacterium rhizogenes* can be used as a promising source in the field of biotechnology. The above bacterium is an effective vector in gene transfer technology which induces plasmids in to the genome of a host plant (angiosperm) for developing the hairy roots. The application of such hairy root culture can help to conserve the endangered plant species and prevent the global environmental problem of deforestation particularly in tropics. This organism is distinguished for its oncogenic phenotype (tumors, hairy roots) and for symbiotic association with host plant. The technology based on above bacterium indicating genetic recombination in plants through bacterial strains. During the course of study to develop hairy root culture in *Tagetes erecta* through *Agrobacterium rhizogenes* the bacterium inoculated in to the seedlings tissues (hypocotyle, root, leaf) using bacterial suspension and bacterial layer methods.

In-vitro, three different parts (leaf, hypocotyle, and stem segments) of 7 days old seedlings have been used as Ex-plants. The bacterial layer method has shown positive response within 72 hours of co-cultivation. The emergence and proliferation of small hairy roots were observed over the medium after 7 days. After 10 days inoculation the hairy roots were induced from the hypocotyle of explants. The hypocotyle segments showed excellent results for 70% if properly wounded. After induction of hairy root culture effect of exogenous auxin and sucrose concentration in culture medium has been studied, it has been found that auxin (IBA) in low concentration (0.25 μ M) enhanced formation of secondary branches as well as growth of hairy roots. The optimum concentration of auxin for branching and growth of transformed hairy root was 1 μ M. Sucrose concentration moderately affected the growth of hairy roots. Optimum concentrations of sucrose for growth of hairy root were range from 2% and 4%. The highest growth has been observed at 4% and higher concentration caused a progressive reduction in root growth. With the combination of 1 μ M auxin and 4% sucrose in culture media optimum growth of hairy root culture have been found.

The developing hairy roots in *T. erectus* is an expression of novel gene for the improvement of economically important plant species and production of secondary metabolites in hairy root culture, which are normally synthesized in the roots of the intact plant. The prospects of hairy root culture of *T. erecta* and extraction of bio-active compounds like thiophene and others, which may have anti-plasmodial activity and antimicrobial activities.

Key words: Hairy root culture, *Agrobacterium rhizogenes*, *Tagetes erecta*, bioactive compound, Auxin, IBA: Indol Butyric Acid.

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One solution to solve the global pollution: an experience based study with microorganism

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Abstract

Composting is a fermentative decomposition of non-living organic matter. Microorganisms including fungi, bacteria & *Actinomycetes* carry out the decomposition process. It has the potential to manage most of the organic material in the waste treatment including restaurant wastes, leaves and yard wastes, farm wastes, animal manure, paper products, sewage sludge, wood etc, and can play a significant role in any waste management plan. The job of natural transformation of organic wastes to simpler more desirable or less toxic inorganic simpler substances is carried out by microorganisms which includes fungus, bacteria and *Actinomycetes*, the process called Biooremediation. The biological decomposition of solid wastes are mainly brought about by effective microorganism which are mainly photosynthetic bacteria, Lactic acid bacteria, yeast's, *Actinomycetes*, fermenting fungi (*Aspergillus* & *Penicillium* sp.) etc. The microorganisms which carry out the composting process requires a balance of food, air and water for quick composting. Other variables affecting the speed of composting include mainly temperature, surface area and volume. Effective Microorganisms gives us one solution to solve the global pollution issues of the earth.

Keywords: Composting, Microorganisms, Organic Substances

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Effect of medicinal plants in chhattisgarh state as – natural anticancer agent.

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Abstract

Chhattisgarh is the largest producer of medicinal plants and is rightly called the “Botanical garden of the World”. The medicinal plants, besides having natural therapeutic values against various diseases, also provide high quality of food and raw materials for livelihood. Considerable works have been done on these plants to treat cancer, and some plant products have been marketed as anticancer drugs, based on the traditional uses and scientific reports. These plants may promote host resistance against infection by restabilizing body equilibrium and conditioning the body tissues. Several reports describe that the anticancer activity of medicinal plants is due to the presence of antioxidants in them. In fact, the medicinal plants are easily available, cheaper and possess no toxicity as compared to the modern (allopathic) drugs. Hence, this review article contains 66 medicinal plants, which are the natural sources of anticancer agents.

Keywords: Cancer, medicinal plants, natural anticancer agents, anti oxidants.

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Studies of pest attack on endangered medicinal plants of *Gloriosa superba* L.

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Abstract

Glory Lily (*Gloriosa superba* L.) belongs to the family Liliaceae and currently considered endangered in State Medicinal Plant Boards, Chhattisgarh and also critically vulnerable by National Medicinal Plant Board, India. It is an ancient medicinal plant in India and major source of colchicines and colchicoside. In the present investigation two major pest attacks were recorded on *Gloriosa superba* L. i.e. Lily caterpillar (*Polytela gloriosae*) and cabbage semilooper (*Plusia orichalcea* Fab.) which belongs to order lepidoptera and family noctuidae furthermore attacking period of June to October at experimental field's garden as well as forest area. Major intention of studies is control the different developmental stages of instar and develop a defensive method by chemical as well as ecofriendly biological control methods. This study will be helpful for plant conservation from pest infection apart from other factors.

Keywords: Glory Lily, Medicinal plants, endangered, pest attack, biological control methods.

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Trials for germination enhancement in *Rauvolfia serpentina*(Benth.); An endangered medicinal plant

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Abstract

Rauvolfia serpentina (Benth.) is a medicinally important perennial herb belongs to the family apocynaceae. For centuries, root of *R. serpentina* has been used in the traditional Unani and Ayurvedic medicine. But during the middle of 20th century the importance of its major alkaloid reserpine has attracted much attention in the field of allopathic medicine as aremedy for hypertension, insomnia and schizophrenia. *Rauvolfia* is is threatened with extinction due to its over exploitation by local people, government agencies and various pharmaceutical houses. Propagation by means of seeds is very tough. In literature it has been reported as 20% to 25%.

Viewing this particular reason in present work efforts have been made to enhance germination percentage of *R. serpentina* using different combinations. Maximum germination was obtained in hot water treatment at 80 C for 30 min, whe it was set for the germination in mixture of Garden soil and Vemicompost in the ratio 1:1 in pots. The same trial was not true in case of laboratory using petriplates(TP). Further experimentation is under progress.

Keywords: Medicinal Plants, *Rauvolfia serpentina*, endangered species

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To study the antimicrobial effect of leaf of *Calotropis procera*.

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Abstract

The antimicrobial effect of ethanol, chloroform and aqueous extracts of leaf of *Calotropis procera* against selected bacteria namely, *Staphylococcus warneri*, *Micrococcus Roseus* and fungi, *Aspergillus niger*, *Aspergillus flavus* were determined using paper disk method. The leaf extract showed various levels of antimicrobial activity on different test organisms. Among the tested materials it was found that ethanol extract gave the best result as compare to chloroform and aqueous extract. Ethanolic extract was found to be best extractive solvent and gave the widest zone of inhibition (12 mm) against *Micrococcus roseus*. The two test fungi was also inhibited by the three extracts and among them again ethanolic extract gave the best widest zone of inhibition (10 mm) as compare to other extract of *Calotropis procera* leaf. This study shows that *Calotropis procera* can be used in traditional medicine.

Keywords: *Calotropis procera*, antimicrobial, extract.

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Study of root tips of two common medicinal plants during cell multiplication stage

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Abstract

Garlic & Onion as two common medicinal plants uses in almost every household. The products of these used must be quite fresh. The aim of this experience is to observe and possibly photograph the process of cell multiplication at particular stage. In order to do this, we used apical meristems of garlic or onion roots, where the growth is greatest and therefore the number of duplicating cells is relatively high. During cell multiplication at mitosis stage, from the original cell two cells are derived, each of which possesses the same genetic material. The cell grows in size, doubling its DNA and preparing itself for mitosis at interphase stage. These growth tissues are found principally in the roots, in the shoots and in the cambium. There are many different versions of this experience. We chose a simple procedure that can be carried out using materials that are easily found in the home. Colouration of the mitotic spindle would also be useful to more fully illustrate the phenomenon of cellular duplication. And a colorant would be necessary, not blue but instead red or orange. This simple experiment can help give an idea of the complexity, of the precision and of the fascination of the processes that sustain the life of living organisms.

Keywords: Root tips, Acid Treatment, Incubation, Microscopic Slide, Microscope

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Folk medicines and medicinal plants of Korla district Chhattisgarh

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Abstract

Medicinal plants are integral part to human healthcare . Dependence on medicinal plants is more in developing countries as compared to developed ones. Among Developing countries this dependence increases with the remoteness of the human habitation. In India , majority of population, particularly in rural areas is not in a position to afford costly modern healthcare system. Majority of them relies on traditional system of medicine. The state of Chhattisgarh is blessed with wide variety of medicinal and aromatic plants. .

Korla district in C.G. lies between 22° 58' and 23° 51' N latitude and 81°59' and 82°45' E longitude . It has afforestation area of 81.23 %. The district has a sizeable tribal population using enormous range of plants for their basic needs , health care and livelihood. They have their own ways of using the medicinal plants, Present paper deals with 62 plants which are used by them for the cure of different ailments. The local name ,medicinally important plant part used has been described. Information was gathered by interacting with local people by making questionnaires. This traditional knowledge needs to be conserved ,documented, and there should be a legal framework for protecting this traditional knowledge relating to sustainable harvest, cultivation and use.

It is evident from the present findings that Korla district as Sal dominant regenerating forest is endowed with large numbers of medicinal plants. Proper identification of the medicinal plants species has a vital role in extraction of this natural wealth and conservation of biodiversity in the forest.

Key words: Korla , Medicinal plants, Aromatic Plants, Traditional knowledge

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Antimicrobial activity of folk medicinal plants against UTI pathogens

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Abstract

Bacterial pathogens have evolved numerous defense mechanisms against antimicrobial agents; hence resistance to old and newly produced drugs is on the rise. The phenomenon of antibiotic resistance exhibited by the pathogenic microorganisms has led to the need for screening of several medicinal plants for their potential antimicrobial activity. Thus the present study was undertaken to investigate the antibacterial activity of 8 medicinal plants used against UTI causing isolates. The antibacterial activity of aqueous, ethanol and acetone extracts of *Andrographis paniculata*, *Azadirachta indica*, *Bacopa monnieri*, *Bauhinia variegata*, *Coriander sativum*, *Euphorbia ligularia*, *Ocimum sanctum* and *Zinziber officinale* was determined against 28 UTI isolates i.e. *Proteus mirabilis* (10), *Escherichia coli* (6), *Proteus vulgaris* (6), *Klebsiella pneumoniae* (5) and *Pseudomonas aeruginosa* (1) by disc diffusion method. Our studies concluded that crude extracts of the selected plants especially the acetone and ethanol extracts exhibited significant activity against UTI pathogens. It can be concluded that these plants can be used to discover natural products that may serve as lead for the development of new pharmaceuticals addressing the major therapeutic needs.

Key words: UTI, Medicinal Plants, Antimicrobial Activity and Disc Diffusion Assay.

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Biodiversity of *Aspergillus* sp. in the environment of Nawapara (Rajim), district- Raipur, (C.G.)

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Abstract

Fungal bioaerosols always present in the atmosphere are varying from season to season, month to month, day to day and place to place. Environmental conditions plays an important role for distribution of bioaerosols. Biodiversity of *Aspergillus* sp. in the environment of Nawapara (Rajim) was assessed from July 2008 to June 2009 with the help of gravity petriplates method containing Potato Dextrose Agar Media. During present investigation total 18 *Aspergillus* sp. were observed during the July 2008 to June 2009. It was observed *Aspergillus niger* (14.41%), *A. flavus* (11.65%) and *A. versicolor* (4.53%) were most abundant, while *A. fumigatus* (1.47%), *A. sydowii* and *A. luchiensis* (1.34%), *A. terreus* (1.04%), and *A. nidulans* and *A. speluneus* (0.36%) etc. were least abundant *Aspergillus* sp. The most frequent *Aspergillus* sp. were *A. flavus*, *A. niger* (100%), while *A. versicolor* (75%), *A. fumigatus*, *A. luchiensis* and *A. sydowii* (66.66%), *A. carneus* and *A. terreus* (50.00%) and *A. nidulans* (16.66%) were least frequent *Aspergillus* sp. in the environment of Nawapara (Rajim) District- Raipur (C.G.).

Keywords: Biodiversity, Bioaerosols, Environment, *Aspergillus* sp.

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Emerging eco-tourism in Chhattisgarh

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Abstract:

Eco-tourism both at conceptual and empirical levels is significant in a number of respects. Traditionally it encapsulates scientific, aesthetic, and philosophical approaches which reflect the structure and function of the society. Over the decades numerous changes have been observed both in the content and context of eco-tourism. With globalization the processes of these changes not only widened and multiplied, but also gained in importance. Chhattisgarh, the 26th state of the Indian, is located in the central part of India. The newly formed Indian state of Chhattisgarh is famous for its enchantingly beautiful natural landscapes, rich cultural heritage and unique tribal populations. With over 44% of its total area under forests, Chhattisgarh is also amongst the greenest states of India. The Chhattisgarh region is known as a great repository of biological diversity. Chhattisgarh is one of the greenest states of India with over 44 % of its total area under lush forests. The forests of Chhattisgarh are not only known for their diverse flora and fauna but also contain about 88 species of medicinal plants. In addition, Chhattisgarh has also formulated several ecological plans and working in the direction to become the country's first bio-fuel self-reliant state by 2015. And to achieve this goal the green state has devised a plan to plant over 100 million saplings of *Jatropha Carcus*. Chhattisgarh is also unique in its wildlife population and has 3 National Parks and 11 Wildlife Sanctuaries, housing some of the rare wildlife and bird species. With so much of variety for eco-tourism, Chhattisgarh promises to be an ideal holiday destination for nature lovers, wildlife enthusiasts and also for those who want to discover the unique tribal life of the region.

The present research paper in observing the treasure of tourism of the Chhattisgarh region in central India emphasizes the potential of eco-tourism in the scheduled areas which are largely dominated by the tribal communities. It argues - and concludes by way of recommendations - that if Eco-tourism is properly developed it can not only attract tourists from far and near, but can also generate more revenue for the inhabitants of the region and for the state.

Keywords: Eco-tourism, Chhattisgarh, Medicinal plants