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1. Role of Libraries in Human Development

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Abstract

Libraries have great role in the social and human development through education, knowledge via historical, geographical collections. Humans learn from books and get modified in their society. Library science is an interdisciplinary or multidisciplinary field that applies the practices, perspectives, and tools of management, information technology, education, and other areas to libraries; the collection, organization, preservation, and dissemination of information resources; and the political economy of information.

Key Words : Interdisciplinary, Library Science, Human Development, Technology

Introduction

Library science has a great history. If you are considering working in a library, you might curious to know more about library science. Library science is the field of study that teaches how to manage books and other information, particularly through collecting, preserving, and organizing books and other materials in libraries. If you want to work as a professional librarian in a public or academic library, you generally will need to get a Master of Library Science (MLS) degree. Sometimes the degree is called an MLIS, which stands for Master of Library and Information Science.

You may be especially curious to know what kinds of courses you would take or topics you would cover if you studied library science. How hard can it be to take care of books? The answer is that it can be more challenging than you think. Libraries play a vital role in education both within schools and colleges and within local communities, and they manage an ever increasing amount of materials, including DVDs, CDs, magazines, books, and computer resources. In addition to learning how to care for those resources, librarians also must be good at serving students or the public by helping them to access and use those resources in creative and effective ways.

Some of the topics you might encounter when studying library science include book preservation, digital preservation, managing a library or information center, children's literature, cataloging, research methodology, collection development, and archives management.

Who Studies Library Science

You probably won't study all of those areas and might study others not mentioned. It all depends on what you specialize in, and that probably depends on what kind of library job you're seeking. All sorts of people study library science, especially those who want to direct a library or manage a department within a library. However, there are many different types of libraries you can work in, including K-12 schools, colleges, specialty libraries or library collections within a university (such as law, music, or theology), and public libraries. The director of a library in a small town might need to be a generalist who can handle many different tasks, while the manager of a special collection in an academic or school library might need to have some specific, specialized skills.

Not everyone who works in a library will be a professional librarian, but people in key positions will usually have studied some library science, either at the master's level or lower. There are associate's degrees in library science, which usually help prepare someone to be a library assistant or technician. The American Library Association (ALA) is a good place to start to explore the different kinds of library jobs and to see what level of education you might need within the field of library science.

Working in a library can be a rewarding job for people who enjoy working with books and other resource materials and helping people to access them for what they need. Library science is the field you want to explore if that kind of job seems right for you.

Library Science and Human Development

Library Sciences and Human Development is a graduate study option that focuses on the nature and interaction of learning, development, and culture in a variety of settings. We study learning and development where they happen: in families, communities, workplaces, and schools from pre-school to college. We are an interdisciplinary group working at local, state, national, and international levels with a shared focus on equity. Our research approaches are diverse, from ethnography to design-based research to survey and experimental methods. Despite this diversity, we are unified in our interest and commitment to how our work can improve the lives

of real people in real places. We involve students in innovative research around these issues, supported by federal, state, and private funding sources.

Libraries are not just for books any more—in fact, they never really have been. Learning is the focus, in school libraries, especially. Overall, school libraries are about learning, leadership, and literacy—specifically, 21st century literacy, which involves reading all kinds of documents, both print and online, and knowing how to use them to answer questions and support your research. If your passion isn't just about Winnie the Pooh and Harry Potter, but also includes wikis, blogs, and Facebook, if helping kids learn and learning how to learn excites you, then library media is for you.

Today library is not an institute but delivers knowledge for the social development of human beings. Library science is another science in human sciences category. Starting libraries with ICT facilities will enhance the importance of library sciences because they promote researchers and humans willing to develop knowledge and to know the world better. Libraries help the human beings to get acclimatized to various geographical diversities. This is one of the most important contributions of library science.

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2. Role of Phosphorus Sources on Development of Tuber Rot

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Abstract

Potato (*Solanumtuberosum*) is most Nutritive Food Crop is Cultivated all Over the world the crop get affected by various pets and diseases, Among these insects, aphids, viruses bacteria and fungi are major.

The tuber rot is affected by fungi *Sclerotiumrolfsi*causes distraction and damage of Healthy potato and get economic loss to the farmers – for the Control of the diseases different Phosphorus Sources were tested against*Sclerotiumrolfsi*. Among the Corban Sources Glucose,Fructose,Maltose and Cellulose shows stimulatory effect while mannose was inhibitory effect on growth. Mannose shows reduction in growth of *Sclerotiumrolfsi* Causes tuber rot of potato.

Introduction

Potato is important food crop. It contains high in calories, rich in carbohydrates, quality protein, dietaryfibersSo its balance nutritive food. In Small quantities used in snacks and breakfast Preparations processed potato products such as chips and French fires and dehydrated potato for internal and Exports.

Agriculture exports as potato have significance in world economy and improve Indians National Economy. Potato is one of the leading food crops and occupies fourth position, after wheat, rice and maize crops. India is one of the major potato growing countries have rank fourth in area and sixth in production (Nayar and Varma, 1992) Quality of potato protein is comparable to milk and eggs these fox superior to those present in cereals, Pulses and Vegetables. Inhighly populated areas of India potato is major food supplements (Singh, 1999, Praharajetal 2006)

Potato is important part of cotton industries for sizing the clothes. Paper Industries, Production of Alcohol, Adhesive, etc. (Chaddha, 1996) In view of above properties it has been a permanent solution of 21st centuries major problems like Hunger, Malnutrition's and unemployment (Khurana, 2006)

Various pests and diseases including Fungi affected to Potato. The tuber rot is caused by Fungi *scleratiumrolfsi*, causes foulty handling during transportation and poor storage conditions. (Body, 1972 ;Smith at el , 1987 ; Khurana and Chandra, 1980 ; Soman, 2004)

The attempt has been taken to carried out the control of Tuber rot by application of different Phosphorus sources.

Materials And Methods

The role of Phosphorus sources was tested using potato slice method(Solunke, 1989 ; Wakle and Kareppa, 2000) Potato slics of 75 mm diameter thickness ware prepared. The slice were dipped in 0.25% Concentration different Phosphorus sources.

A 5 mm mycelia disc of *scloretiumrolfsi* was inoculated aseptically on eath slice Thelinar growth of *Scierrtiumrolfsi* were measured at 24 hours inteorid The plate rot inoculated tissue acts was control. The result was presented as percent control efficacy. (PCE).

Result

The different Phosphorus sources was used as Glucose, Fructose, Mannose, Maltose, Manito, Cellulose, Lactose, at 0.25%. The linear growth at different incubation period was measured in m.m.

The Phosphorus sources such as Glucose, Fructose, Maltose and Cellulose Stimulate the growth of *Sclerotiumrolfsi*, on other hand mannose was inhibitory on growth. While manitoland lactose shows reduction in growth as compared to control, as shown in table. (Singh 1973, Desai 1994 ;Solunke 1996 and Goswami Islam 1999) similar result.

Table : Role of Phosphorus Sources on Growth of *Sclerotiumrolfsi.*

PhosphorusSource0.25%	Liner Growth (mm) Incubation Period in days							
	1	2	3	4	5	6	7	8
PhosphorusSources	10.3	19.0	28.6	42.0	53.3	60.6	65.3	75.0
Phosphorus Sources	20.6	29.3	36.0	48.6	58.3	69.6	75.0	75.0
Phosphorus Sources	6.6	12.3	28.3	36.0	42.6	50.3	55.6	57.3
Phosphorus Sources	15.3	26.3	34.6	45.3	57.0	67.6	75.6	75.0
Phosphorus Sources	10.6	23.0	30.6	41.0	49.3	56.0	61.6	66.3
Phosphorus Sources	13.13	29.6	37.0	43.6	47.6	58.3	67.0	75.0
Phosphorus Sources	8.6	20.3	29.6	37.0	46.3	51.6	58.3	63.3
Control	15.3	23.6	33.3	45.6	53.3	60.3	68.6	75.0
S.E = +	0.5	0.6	0.3	0.4	0.5	0.5	0.7	0.7
CD – 0.01	2.5	3.0	1.9	2.2	2.9	3.4	3.6	3.8
CD = 0.05	1.6	2.0	1.2	1.4	1.9	2.3	2.4	2.5

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3. Role of Innovative Best Practices of Library in User's Development

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Abstract

Academic College Libraries always support learning, teaching and research processes in institution. The article is focused on Best Practices of library to be followed for all-round human development. It covers various kinds of Best Practices. The present paper also highlights NAAC Best Practices. In this paper mention all types of best practices offers for the users to develop personality. By Best Practice Library has reached up to the certain level. It is a method or technique that has consistently shown results. It is used to maintain quality as an alternative to mandatory legislated standards and can be used on self-assessment. It concludes that the role of innovative best practices of library is not a onetime solution, but a continuous process for user's development as well as nation and global world.

Keyword: ICT Based, NAAC Based, Best Practices,

Introduction

Academic Library Users is attached to the higher education institutions. Those users which can students, researcher, professors, scientists, doctors, advocates, social reformers etc. Academic Libraries are playing a very essential and fundamental role in user's development, higher education, and nation and world development. It acquires processes, organizes the basic information sources and disseminates the vital information to all types of students, faculties and the research scholars for the growth and improvement of the user's development, nation and world development. Information explosion and impact of modern trends use in Libraries on day-to-day.

The global changes particularly the ICT have impact on the functioning of academic libraries. The development in ICT have changed the user's expectation form the academic libraries in different ways.

Librarians challenge, how to process, manage, disseminate information by the effective services. Thus Librarians has one of the best options and it means 'Best Practices'. Librarians are developing successful programs and doing innovative things with and without technology.

Best Practices are the best way to perform a process, a function or an activity that leads to a superior performance. Successfully identifying and applying best Practices to improve the quality of library as well as producing and increasing the users in library for all-round development. Best Practices will help to inculcate necessary environment among the Library users.

Defination of Best Practices

According to Webopedia: "Best Practices are guidelines which are used to obtain the most efficient and effective way of completing a task using repeatable and proven procedures".

According to National Assessment and Accreditation Council (NAAC): Best Practices may be innovative and be a philosophy, policy, strategy, program, process or practice that solve a problem or create new opportunities and positively impact on organizations. Institutional excellence is the aggregate of the best practices followed in different areas of institutional activities.

Best Practices

A best practice is a technique or methodology that, through experience and research, has proven to reliably lead to a desired result. A commitment to using the best practices in any field is a commitment to using all the knowledge and technology at one's disposal to ensure success. The term is used frequently in the fields of library science and elsewhere.

Mission

- Knowledge India
- Everyone Literate
- Innovative Users
- Global Literate Villages
- Equality to All
- Networking with Urban and Rural
- ICT Literacy

Empower the users through value based and user oriented quality service.

Vision

- Awareness of Library
- Awareness of E-resources

- Awareness of LIS Profession
- Maximum use of ICT

To make available the best facilities of higher education for the allround development of the users in India.

Objectives

- To educate the first generation learners.
- To make the students dynamic, skilled, nation loving and visionary citizens.
- To success the Five Laws of Library and Information Science
- To increase the number of users in library for the use of Library resources
- To achieve the target of wall less library
- To provide or disseminate the resources through best library services
- To find out, meet and provide the information on demand
- To maximum the utilization of Library
- To market Library services and products

Scope and Limitations

- To study the Library services
- To study the innovative best practices
- To study the Library Resources
- To study the user's development

Methodology

It should apply observation and survey method for effective library working through Best Practices. Users have one of the best option of library and library best practices for all-round development and improvement.

Impact of the Service

There is qualitative improvement in the services offered to the users by the library staffs that have become enthusiastic and resourceful for all-round personality development and improvement.

Challenges for Library Staff and Libraries

The various challenges are facing today which are as follows:

- Information Explosion
- Knowledge about new technology
- Challenging role of the Librarian
- Resource sharing form electronic formats

- Increased rate of printed book materials
- Database creation and maintenance
- Marketing of Library and Information Products and Services
- Users curiosity
- Lack of training courses
- Time management
- Skill development of Staff

Why Should Start the Best Practices in Libraries?

- For all-round user's development and improvement
- For Library Resources
- For Library Staff
- For Five Laws of Library and Information Science

Best Practices in College Library

Best Practices is good and to help for college library users. Through the library, users achieved the target and develop them. The users develop many types of skills like knowledge, confidence, carrier opportunities, presentation, communication languages and complete personality development. Library helps to build the nation and create global world.It also helps to literacy rate in rural, hilly and adivasi padas. The Best Practices adopted should bridge gap between the library and the users for effective and maximum utilization of the library resources and it will result in the advancement and promotion of higher educational goals and the vision and mission of the library. The Best Practices are classified under the following broad areas.

1. **Management and Administration of Library**
   - Institutional visit
   - Training Programme like Refresher course, Orientation course, Workshop & Short term course.
2. **Users Education**
   - Information Literacy
   - Orientation programme for users
   - Best user award
   - Listening and interaction
   - Book Exhibition
   - User Feedback

3. **Library Working**
   - Extended hours of service
   - Extended Library opening hours
4. **Use of ICT**
   - Internet Access Facility
   - Automated Library
   - Digital Library
   - Wi-Fi Connectivity
   - Library Website or Portal
   - Library Linkages
   - Free Browsing
   - OPAC or WebOPAC
   - Local Area Network(LAN)
   - Storage Type Like CDs, DVDs,Pendrives and Internal Memory
   - Institutional Repository
   - Access to E-resources
   - Electronic Security System
   - E-learning
   - Networking
   - Database
5. **Other Practices**
   - Earn While Learn Programme
   - Student Participative Programme
   - Student Internship Programme
   - Special Deposit Scheme

Following additional Practices

- Actively formed Library Advisory Committee Meeting
- Binding books and volumes
- Library Prospects
- Barcoding of Library resources
- Question sets of previous examination
- Prepared academic calendar
- Regular Pest Controlling and Stock Verification

- Library Security
- More interaction with users
- Always help to users for any types of query about how to use library resources

Examples of All-round development of Few Persons through Library Best Practices

- **Dr. B. R. Ambedkar** Social Reformer and Father of Constitution in India. He has credited more than above 100 books. He has near about 32 thousand books in his personal library. He was best library user.
- **A. P. J. Abdul Kalam** (Great Scientist and Former Prime Minister of India. He was best reader and written many books).
- **Dr. S. R. Ranganathan** He is the father of library science in India.He has credited more than 70 books.
- **Dr, Melvel Dewey** He is also the father and inventor of Dewey Decimal Classification and Library Science.
- **Shri. Atal Bihari Vajpeyee** (Former Prime Minister of India and Poetess)
- **Bill Gates** He is the inventor of Microsoft. The richest man in the world reads 50 books a year.Gates shares that while he can travel anywhere and meet with anyone, reading is still the main way that he learns new things and tests his understanding. He always has a book with him wherever he goes.
- **Warren Buffet** "Read 500 pages every day. That's how knowledge works. It builds up, like compound interest. All of you can do it, but I guarantee not many of you will do it."
- **Mark Cuban** Mark Cuban reads about 3 hours a day because it gives him a level of comfort and confidence in his business. He shares that growing up, he read "every book or magazine I could get my hands on because 1 good idea would pay for the book and could make the difference between me making it or not."
- **Dr. P. S. G. Kumar** He is Librarian, Information Scientist and Research Guide of Library and Information Science. He has credited more than 75 books.

Conclusion

The Best Practices of library is an attitude, an approach or a philosophy based on the desire for continuous learning, all-round development and improvement of users. The Best Practices always help for improving quality of library services. The Best Practices adopted should bridge the gap between library and users for maximum utilization of the resources to every format. It helps discover and close performance gaps, solve a problem, create new

opportunities and positively impact on Libraries. Institutional excellence is the aggregate of the best practices followed in different areas of institutional activities.

- Best Practices is must for rural, hilly and adivasi padas college libraries
- Library Staff should be a lot of skills to implement the Best Practices.
- Principal and Management support for required essential things
- It should be good environment
- Lacks of technology, staffs
- Increasing the number of users in Library
- Library is grow and improve day-by-day
- The fulfillment and use of Dr.S.R.Ranganathan Five Laws by the Best Practices

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4. Seasonal Changes in Protien Content in Ddifferent Tissues of (Bivalve: Mollusc), Lamellidens Marginalis, Collected from two Different Sites of Nathsagar Dam at Paithan (MS)

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Abstract

The present work has been undertaken on the freshwater bivalve shellfish *Lamellidens marginalis* upon the two different habitats i.e.upstream water (Site-A) & downstream water (site-B) separated by 6.5 km flowing distance away from each other. *Lamellidens* species is abundantly found throughout the year along upstream and downstream water of Nathsagar dam at Paithan near Aurangabad, hence it is used in the present study. we report here changes in protein content from different tissues viz, mantle, hepatopancreas, gonad, gills, foot, anterior adductor muscles, posterior adductor muscles of freshwater bivalve molluscs, *Lamellidens marginalis.* collected from two different habitat of Nathsagar dam during three different seasons i.e. summer (April-May), Monsoon (August- September), Winter (December –January). The results were discussed in the light of protein content in the different tissues of bivalve molluscs due to seasonal changes.

Key Words: Bivalve, molluscs, *Lamellidens marginalis*, protein,

Introduction

The proteins are versatile, complex and fragile macromolecules with high molecular weights. They not only serves as fuel to yield energy but also play vital role in every aspect of the structural and functional characteristics of the organism because these are the major essential constituents of the protoplasm and are extremely complex nitrogen containing macromolecules forming the physical basis of life. They occupy a unique position in the cellular metabolism and are highly specific to each tissue. These biopolymers play an important role in nearly all biological processes as structural components, of receptors, help in transport, storage,

mechanical support, control of growth, differentiation, act as buffers in the internal miles and also exhibit osmotic properties. They also act as catalyst (enzymes), regulators (hormones) and repositories of genetic information.

From India relatively a few investigators such as Nagabhushanham and Mane (1975, 1978) on *Katelysia opima* and *Mytilus viridis* and Bidarkar (1975) on *Paphia laterisula* have reported changes in the biochemical composition correlating with reproductive cycle of the bivalves. Many workers have also studied changes in the biochemical constituents of freshwater bivalves due to pollutional stress, including heavy metals, Akarte, (1985), Patil, (1993), Gokhale (1994) while Muley (1988) and Vedpathak (1989) observed fortnightly and monthly changes in biochemical composition. Many commercially important bivalve species occurring in freshwater environment have to face periodic fluctuations in the environmental parameters, which make specific demands on the animals present in it.

Materials and Methods

The freshwater bivalve molluscs, *Lamellidens marginalis* (size ranges between 80 – 90 mm shell length) were collected from two fixed sites i.e. upstream (Site A) and downstream (site B) water separated by 6.5km flow distance away from each other at Nathsagar dam. During different seasons viz., summer (April – May), monsoon (August – September) and winter (December – January). Immediately after bringing to the laboratory, the shells of the bivalves were brushed and washed with freshwater in order to remove the algal biomass, mud and other waste materials. The cleaned animals were then allowed for defecation or depuration for 12 hrs. in laboratory conditions under constant aeration. For biochemical analysis, animals were dissected and removed the mantle, hepatopancreas, gonad, foot, gills, anterior adductor muscles and posterior adductor muscles, 100 mg of each tissue are taken for biochemical analysis. Protein was determined by the method of Lowry *et al.,* (1951) using Bovine serum Albumin (BSA) as standard. Changes in biochemical constituents from different tissues were carried out in all seasons i.e. during summer (April-May), monsoon (August-September), winter (December-January) during study period. The results were expressed as mean values of three replicates for protein contents as /100 mg wet weight of the tissue. All values were subjected to student's 't' test for statistical confirmation.

Result

The changes in the biochemical constituents i.e. protein, from the different tissues of bivalve *Lamellidens marginalis* such as mantle, hepatopancreas, gonad, foot, gills, anterior and posterior adductor muscles are given in the table and figures 1-6.

The protein content in mantle was increased during summer season i.e. (13.6073±1.7237) on April and (12.6121±0.34473) on May, and decreased from gill (4.1532 ±0.29855) on April and (5.0489±0.29855) on May. During monsoon season, the protein content was increased from gonad (10.6218 ± 0.17236) on August and (8.0344±0.29855) on September while the protein content was decreased from gills (5.3474± 0.29855) on August and (4.5513±0.17236) on September. The anterior and posterior adductor muscles shows high values of protein content during winter season i.e. (11.8160±0.91208) in anterior adductor muscles and (11.3184±0.29855) in posterior adductor muscles during the month of January in animals collected from site-A.

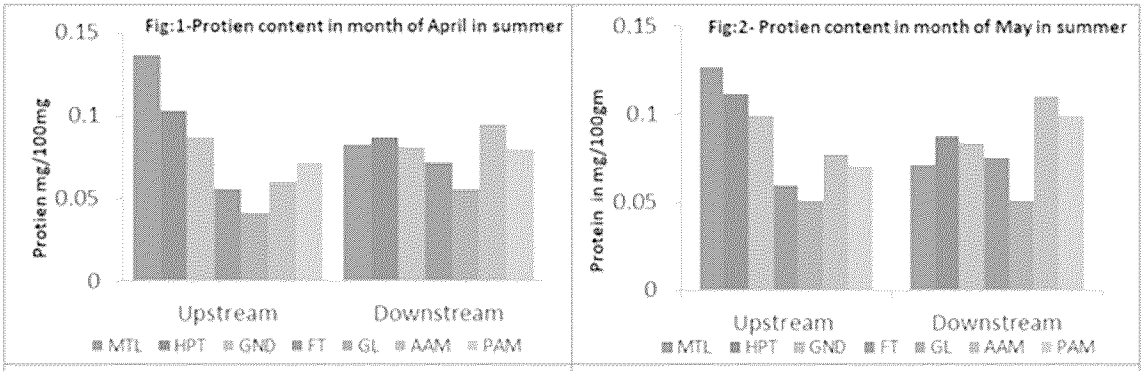
While the protein content in anterior adductor muscles was increased during summer season i.e. (9.5271±0.51710) on April and (11.0199±0.51710) on May, and decreased from gill (5.5464 ±0.17236) on April and (5.0489±0.29855) on May. During monsoon season, the protein content was increased from gonad (11.3184±0.29855) on August and (7.2382±0.45604) on September while the protein content was decreased from gills (4.1532 ± 0.29855) on August and (4.8498 ± 0.91208) on September. The higher values of protein recorded in anterior and posterior adductor muscles during winter season i.e. (11.8160±0.34473) in anterior adductor muscles and (10.7213±0.29855) in posterior adductor muscles during the month of January in animals collected from site-B.

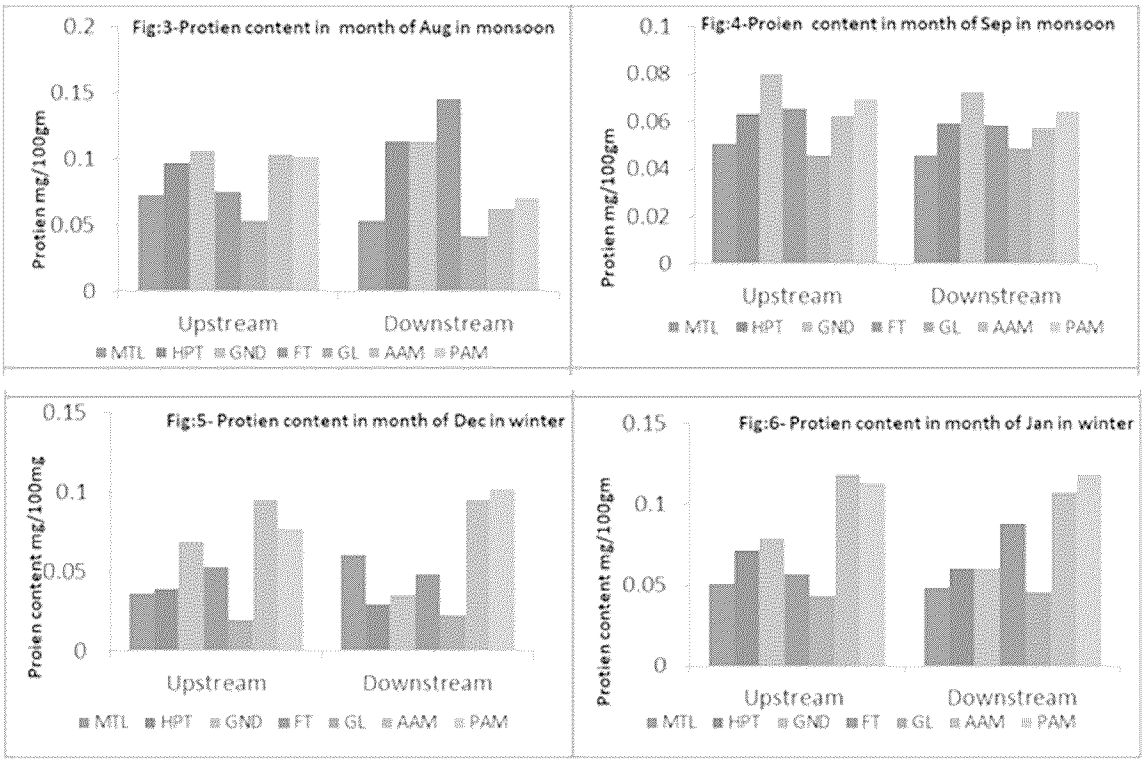
Tissues	**Site-A (Upstream water)**					
	Summer		**Monsoon**		**Winter**	
	April	May	Aug	Sep	Dec	Jan
MTL	13.6073 ± 1.72367	12.6121 ± 0.34473	07.2382 ± 0.34473	05.0489 ± 0.29855	03.5895± 0.34473	05.0489± 0.5971
HPT	10.3232 ± 0.17236	11.1194 ± 0.17236	09.7261 ± 0.17236	06.3436 ± 0.62148	03.9542± 0.17236	7.13877 ± 0.29855
GND	08.7310 ± 0.45604	09.9252 ± 0.17236	10.6218 ± 0.17236	08.0344 ± 0.29855	06.8402± 1.03420	07.9348± 0.17236
FT	05.5464 ± 0.17236	05.9445 ± 0.78981	07.5368 ± 0.62148	06.5416 ± 0.29855	05.2479± 0.34473	05.646± 0.29855
GL	04.1532 ± 0.29855	05.0489 ± 0.29855	05.3474 ± 0.29855	04.5513 ± 0.17236	01.9638± 0.17236	04.3522± 0.17236
AAM	06.0440 ± 0.17236	07.7358 ± 0.29855	10.3232 ± 0.95970	06.2431 ± 0.51710	09.5271± 0.29855	11.8160± 0.91208
PAM	07.1387 ± 0.29855	07.0392 ± 0.17236	10.1242 ± 0.29855	6.9397 ± 0.17236	07.7358± 0.29855	11.3184± 0.29855

Tissues	Site- B (Downstream water)					
	Summer		Monsoon		Winter	
	April	May	Aug	Sep	Dec	Jan
MTL	8.2334 ± 0.68947	7.1387 ± 0.29855	5.3474 ± 0.29855	4.5513 ± 0.172367	6.0440 ± 0.912085	4.8498 ± 0.91208
HPT	8.9300 ± 0.78988	8.7310 ± 0.45604	11.3184 ± 0.29855	5.9445 ± 0.51710	2.9590 ± 0.29855	6.0440 ± 1.50266
GND	8.1339 ± 0.172367	8.3329 ± 0.29855	11.3184 ± 0.29855	7.2382 ± 0.45604	3.5561 ± 0.78988	6.0440 ± 0.68947
FT	7.1387 ± 0.29855	7.5368 ± 0.172367	14.5029 ± 0.62148	5.8450 ± 0.172367	4.8498 ± 0.34473	8.8305 ± 1.502668
GL	5.5464 ± 0.172367	5.0489 ± 0.29855	4.1532 ± 0.29855	4.8498 ± 0.91208	2.2624 ± 0.34473	4.5513 ± 0.62148
AAM	9.5271 ± 0.51710	11.0199 ± 0.51710	6.2431 ± 0.29855	5.7455 ± 0.172367	9.5271 ± 0.29855	10.7213 ± 0.29855
PAM	7.9348 ± 0.45604	9.9292 ± 0.172367	7.0392 ± 0.172369	6.4421 ± 0.34473	10.2237 ± 0.62148	11.8160 ± 0.34473

Table – Changes in the protein contents from different tissues of *Lamellidens marginalis* collected from upstream and downstream water of Nathsagar dam during summer, monsoon and winter season.

(MTL= mantle; HPT= hepatopancrease; GND= gonad; Ft= foot; GL= gill; AAM= anterior adductor muscle; PAM= posterior adductor muscle)





Discussion

Studies on changes in the biochemical energetics in relation to reproductive cycle in bivalve molluscs, have been carried out extensively and has been reviewed by many workers (Bayne 1976, Sastry 1979, Voogt, 1983). Voogt (1983) stated that biochemical constituents in bivalves are multifunctional and that in different species one or some of the functions during maturation of gonads, drastic environmental conditions, starvation etc. are more pronounced. The inter relationship among food sites of energy reserves and the utilization of reserves relative to gamete development in the mussel *Mytilus edulis* has been discussed in detail by Gabott and Bayne (1973). Giese *et al.* (1967) found increased protein level in *Tivela stulforum* and decreased carohydrate level during gametogenesis, but the lipids remain unaltered. According to Ruiz *et al.* (1992) seasonal changes in biochemical components of the oyster *Ostrea edulis* showed similar time course accumulation of lipid and carbohydrates, whereas proteins were constant, when food were abundant, energy reserves were built up. From the while body of *Perna viridis*, the protein content remained high throughout the year but decreased during the breeding period (Nagabhushnam and Mane, 1978).

The percent utilization of proteins was far less than carbohydrates, considering this fact, in the present study significant changes occurred in protein content of different tissues of

different seasons. The effect was more pronounced in animals collected from downstream water than animals collected from upstream water.

In the present study, seasonal cycle of storage and utilization of protein content in *Lamellidens marginalis* is closely linked to food supply and gonad development. The content increases in hepatopancreas, gonad and both adductor muscles of animals from habitat –A during monsoon and hepatopancrease, gonad and foot of animals from habitat –B at the time of abundant food availability in monsoon. The highest accumulation of this content is seen in hepatopancreas. Protein content is also build up in mantle and gonad.

In present study, mantle tissue also showed high protein content in summer season. The gonad fairly stored equal amount of protein during all the seasons. This indicates that at the time of fully mature gonads and when spawning takes place this content increases Ansell *et al.* (1964) in *Mercenaria mercanaria* found little seasonal variation in the biochemical composition of adductor muscle, mantle, siphons, gonads, digestive gland and foot. In these organs, carbohydrates decreases with the corresponding increase in proteins during the period of gonad proliferation. Since *Lamellidens marginalis* is a freshwater species and inhabit upon the upstream & downstram of Nathsagar the seasonal cycles in storage and utilization of the organic reserves are dependent upon external environment, in particular food availability and the body functioning Walne (1973) while studying growth rates and nitrogen and carbohydrate contents of the clam, *Saxidomus giganticus* found that differences in the food supply can alter the Protein : Carbohydrate ratio in the flesh of clams due to the species of algae fed and possibly by the physiological state of an algal species.

It is likely that in *Lamellidens marginalis* different food supply in different seasons must have resulted in differentiation in the amount of organic reserves in different tissues. In *Tellina tenuis*, Ansell (1961) showed gonad relationship to seasonal changes in reproductive activity and food. In *Lamellidens marginalis* protein content was found at a low level from posterior adductor from gills, foot and adductor muscle during summer. In bivalve molluscs, utilization of proteins during greater energy demand is well documented. During monsoon, when the environmental conditions are likely to become favorable for the mussels and as the gonad matured the spawning was noticed. Apart from the likely impact of environmental parameters on these mussels, in reducing the rate of respiration, it was seen that the mussels in monsoon had low level of protein in mantle and hepatopancreas and high levels of protein in foot, gonad and adductor muscles. The author concluded that in *Lamellidens marginalis* the organic constituents from different body components particularly in bivalve collected from downstream water were

stored and utilized according to existing external environment including food availability to complete the reproductive events. As the food availability increased during August the organic reserves were built up but as it decreased the animals were frequently stored and did not spawned continuously but completed the reproductive events at interruption from post monsoon to early summer. In the present study on *Lamellidens marginalis* the changes in the protein, contents from the animals upon both habitats correlated with the reproductive events. All the contents stored elevated values during the maturation and partially spawning stages on August with the onset of rainy season in August, the gametes were released. The biochemical contents decreased significantly, On December the males and females were in all the stages of reproductive activity. The metabolic rate was slightly elevated. The protein content decreased considerably in all tissues except foot of animals collected from upstream.

Nutrients from ingested food are distributed to various body organs for assimilation and storage. For many species it is still unclear whether gonad development depends on food ingested directly from the surrounding water, or an stored reserves or an both. The relationship among food availability in the environment storage and reproductive activity varies among species. In the present study on *Lamellidens marginalis* in biochemical changes that the organic reserves particularly the protein is stored more during monsoon at the time of plenty of food availability. In species occurring in several climatic zones, the reproductive cycle may vary in relation to local environment as a phenotypic response of a single genotype or it could be distinctly genetic or both (Sastry, 1970). After attaining certain physiological status or organisms expose to the required environmental pre-requisites besins gonad growth, Gametogenesis and maturation of gametes in bivalves are under several exogenous (e.g. temperature, lunar periodicity, depth, mechanical factors, food abundance and availability, light intensity etc.) endogenous (e.g. genetic, hormonal control (Sastry, 1979).

Conclusion

The changes in biochemical reserve like protein showed a close relationship with the reproductive activity and the favorable environmental conditions. It was observed that the contents were increased, when the gametes were matured in August and showed a decrease in September, when the spawning activity was at its peak. The metabolic rate was also lowered in this period, when the conditions were favorable i.e. increased in water level, low turbidity, decreasing temperature and metabolic rate was slightly increased, the animals build up their body reserves. During May the animals showed continued gametogenic stage. During this period the

protein contents decreased. The decreased levels of these contents were probably due to nourishment for development of the gamete.

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5. Seasonal Variation of Deaths in Jalgaon District of Maharashtra State: A Case Study of Selected Villages in Jalgaon District

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Abstract

The study of mortality is useful for analyzing current demographic conditions as well as for determining the prospects of potential changes in mortality conditions of the future. The public health administration depends heavily on the study of mortality, for statistics on death in the population cross-classified by age; sex and the cause of death are of great value for the formulation, implementation and evaluation of public health programmes. Statistics on deaths also form the basis of the policies of insurance companies. It is, of course, possible to study mortality, from several angles, for various biological, social, economic and cultural factors affect the health of an individual and consequently the mortality rate in society. These factors affecting mortality can be classified under heredity, constitution and environment. When mortality is viewed from the demographic point of view, it is studied to determine changes in the population size and structure, rather than from the medical angle.

We also studies adoption of various human groups, culture, customs and economic activities with their respective environments in different parts of the world. *(Dr. S.B. Sawant)* In this case study more attention is given to find out the seasonal variations of deaths of population especially in rural region of some selected villages of Jalgaon district of Maharashtra state.

Key Words: Seasonal, Variation, Proportion, Deaths, Population, Rural

Introduction to Study Region

Jalgaon District is located in the north-west part of the Maharashtra. Out of the total population about 79.73 percent population is literate and about 13.9 percent population belongs to scheduled caste, 10.3 percent scheduled tribes and 36.48 percent population is engaged in agricultural activities. The study region is marked by Satpura upland in the north and Ajanta ranges in the south. All tehsils have different socio-economic status.

Study region is located in the north of Maharashtra, Satpura Ranges in the north, river Tapi and its bad land and between these vast east-west elongated piedmont plain, Girna, Wghur, Purna, Bori river basins are unique physiographic units. Most of the villages located in Satpura upland are inaccessible. PHC centers or private hospitals are near about 20 to 30 km away from these tribal villages. In piedmont plain and southern rivers basins compact settlement pattern is found.

Location of Villages Selected for Case Study

Table No1 : Surveyed Population in the Villages: 2016

Sr.	Tehsil	Location(Lat-Long)	Village	Population
1	Chopda	21.2359 to 75.3548	Rukhankhede	144
2		21.2003 to 75.2756	Majare Hol	138
3	Pachora	20.8109 to 75.4269	Dhokalkhede	137
4		19.5029 to 74.6758	Lakh	104
5	Yawal	21.1307 to 75.2756	Vadhode	98
6		21.0755 to 75.7874	Bhortek	109
7	Amalner	21.1702 to 75.1244	Hingone Sim	119
8		21.1736 to 75.1077	Hingone Kh.	135
9	Dharangaon	21.0153 to 75.3762	Chinchpure Bk.	134
10		21.0017 to 75.3431	Kalyane Kh.	130
11	Jalgaon	21.0226 to75.6326	Tarsod	180
12		20.9540 to 75.4999	Dhanore Kh	114
13	Erandol	20.9546 to 75.4918	Khedi Kh.	156
14		20.9261 to 75.4967	Dapori	140
15	Raver	21.0807 to 75.9355	Mangalwadi	131
16		21.1222 to 75.9898	Bhamalwadi	136
17	M'Nagar	21.1355 to 76.0852	Kothe	107
18		21.0536 to 76.0931	Kund	116
			Total	**2328**

Objectives

1) To analyze the villagewise and month wise number of deaths of surveyed villages.
2) To classify the villagewise and monthwise data of deaths into different seasons.
3) To find out the villages and months in which numbers of births are reported more in specific season.
4) To compare number of deaths with every season.

Data Base and Survey Methodology

Sample villages are selected considering the following criteria:

- Geographical location of the village.
- Intensity of seasonality of deaths during the period 2006 to 2010.

From each village 30 families are personally interviewed and information is collected through questionnaires and personal observations. Thus 531 households are interviewed and analyzed to interpret an impact of Seasons on human deaths.

Explaination of Villages Selected for Case Study

Surveyed Population in the Villages Selected for the Case Study

Researcher has approach to 531 families comprising 2328 peoples to check the ground truth of results obtained after analysis of monthly and seasonaldeaths in Jalgaon district. Table No. 1 is showing name of tehsils, geographical location of villages, name of the villages and total surveyed population.

Data Sources

Authentic data obtained from survey of 18 selected villages of 9 tehsils of Jalgaon district.

Data Analysis Techniques: Microsoft Excel and Access software is used to analyze data. Various Statistical techniques are used.

Discussion

1: Season wise Proportion of Deaths in Surveyed Villages of Jalgaon District

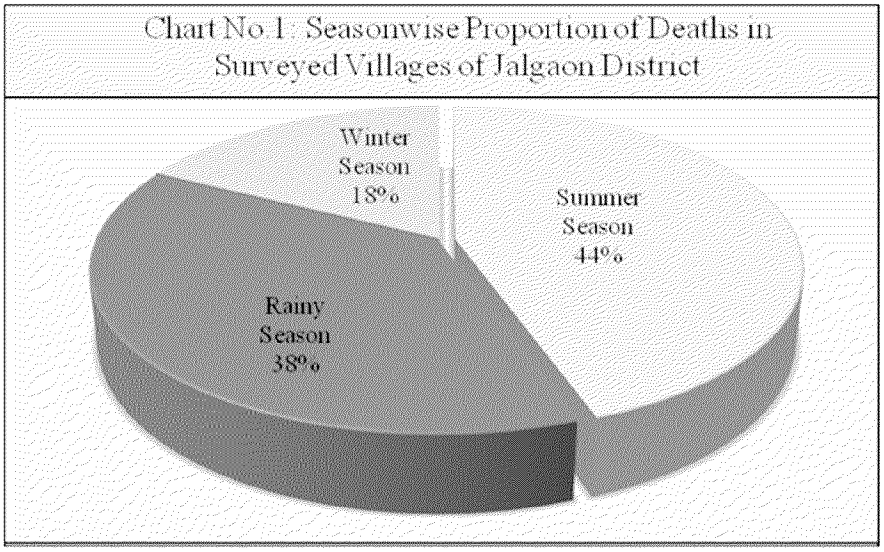
To explain seasonality of deaths researcher has collected authentic data of number of deaths for the year 2006 to 2010 (1498 villages) and analyzed. The results are showing that large numbers of deaths are reported in rainy season. To make ground truth researcher has visited to 531 families of 18 villages. Table No. 2 is showing villagewise and season wise proportion of deaths in surveyed villages. With the help of this table Chart No.1 is prepared. The average deaths are reported during summer season (44%), followed by rainy season (38%) and in winter season (18%).

Table No. 2: Season wise Proportion of Deaths in Surveyed Villages of Jalgaon District

Sr. No.	Tehsil	Village	Summer Season	Rainy Season	Winter Season
1	**Chopda**	Rukhankhede	13	75	12
2		Majare Hol	70	20	10
3	**Pachora**	Dhokalkhede	40	20	40

4		Lakh	50	50	0
5	**Yawal**	Vadhode	40	20	40
6		Bhortek	50	0	50
7	**Amalner**	Hingone Sim	100	0	0
8		Hingone Kh.	20	40	40
9	**Dharangaon**	Chinchpure	38	25	37
10		Kalyane Kh.	40	40	20
11	**Jalgaon**	Tarsod	62	38	0
12		Dhanore Kh	50	50	0
13	**Erandol**	Khedi Kh.	25	75	0
14		Dapori	42	29	29
15	**Raver**	Mangalwadi	25	63	12
16		Bhamalwadi	100	0	0
17	**M'Nagar**	Kothe	0	100	0
18		Kund	38	38	24
Average			**44**	**38**	**18**

Source: Data Obtained From Village Survey

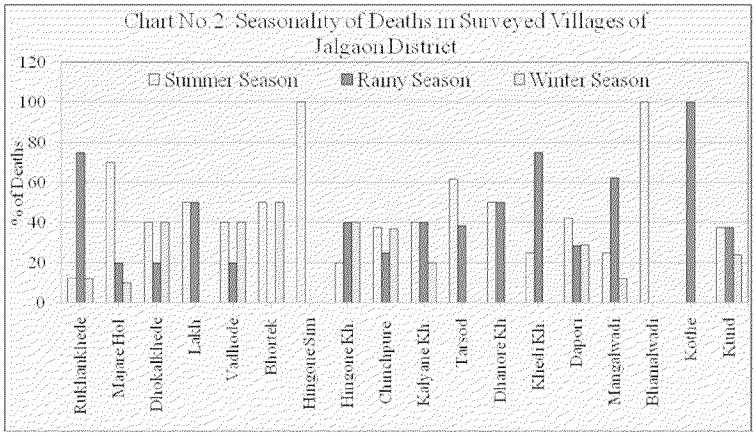


This result shown in chart No.2 is showing villagewise and season wise seasonality of deaths in surveyed villages. This chart reveals that large proportions of deaths are reported in Rukhankheda, Khedi Kh., Mangalwadi and Kothe village. It is interesting to note that 100% of the total deaths is found in rainy season village Kothe is located near to river Tapi, while village Rukhankheda is located near the bank of Gul river. Village Khedi Kh. is located near river Girna. Village Mangalwadi is located near the bank of Tapi and Hatnur dam. All these villages are

located near the banks of large rivers, have large number of deaths in summer season. Detail study of flood hazards and deaths are necessary.

In summer season large number of deaths are reported in village Majare Hol (more than 50%), Hingone Sim (100%), Tarsod (61%) and Bhamalwadi (100%) of the total reported births are found.

It is clear that summer and rainy season have large number of deaths in surveyed villages.



2. Causes of Deaths in Surveyed Villages

During field survey households have given correct information of deaths. Table No.3 is showing villagewise proportion of deaths due to different causes in surveyed villages.

This table clears the fact that 37% deaths are reported due to old age. Heart attack causes are found 17% of the total deaths, while accident cases are also alarming (10%). It is clear that 64% deaths are found due to over age, heart attack and accident. Remaining cases are insignificant.

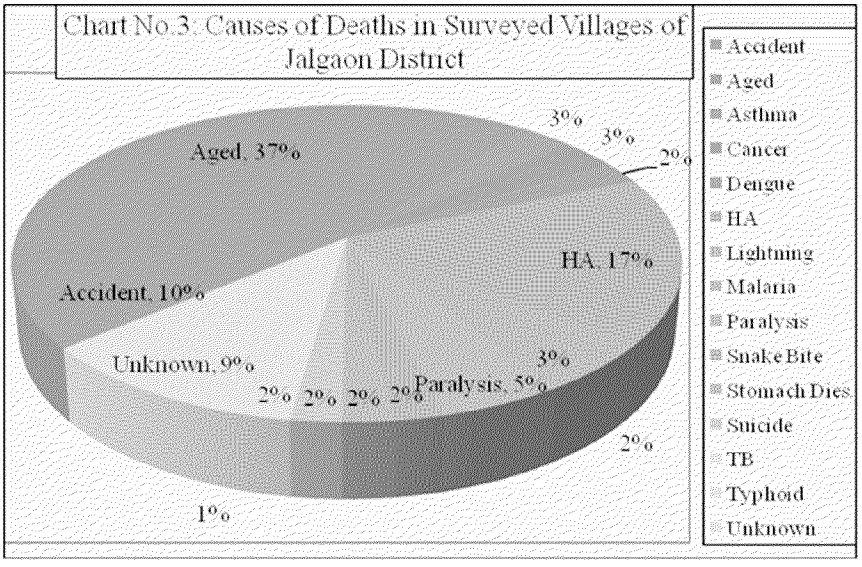
Large number of accident cases is found more in village Dapori, Hingone Kh., Rukhankheda, Dokalkhede and Vadhode, while 100% deaths of heart attack is reported in Bhamalwadi , while more than 50% deaths are found in village Bhortek and Hingone Sim, while 25% to 50% deaths are found in villages Dapori, Hingone Kh. and Kund.

Table No.3: Proportion of Deaths due to various Causes in Surveyed Villages

Village	Rukhankhede	Majare Hol	Dhokalkhede	Lakh	Vadhode	Bhortek	Hingone Sim	Hingone Kh.	Chinchpure	Kalyane Kh.	Tarsod	Dhanore Kh	Khedi Kh.	Dapori	Mangalwadi	Bhamalwadi	Kothe	Kund	Total (%)
Accident %	**25**	**0**	**20**	**0**	**20**	**0**	**0**	**25**	**13**	**0**	**0**	**0**	**0**	**29**	**0**	**0**	**0**	**13**	**10**

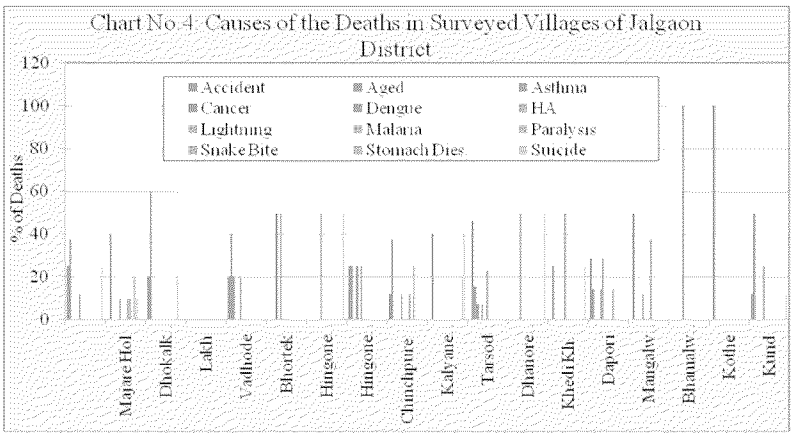
Aged	**38**	**40**	**60**	**0**	**40**	**0**	**0**	**25**	**38**	**40**	**46**	**0**	**25**	**14**	**50**	**0**	**100**	**50**	**37**
Asthma	0	0	0	0	20	0	0	0	0	0	15	0	0	0	0	0	0	0	**3**
Cancer	0	0	0	0	0	50	0	25	0	0	8	0	0	0	0	0	0	0	**3**
Dengue	0	0	0	0	0	0	0	0	0	0	0	50	0	14	0	0	0	0	**2**
Heart Attack	**13**	**10**	**0**	**0**	**20**	**50**	**50**	**25**	**13**	**0**	**8**	**0**	**0**	**29**	**13**	**100**	**0**	**25**	**17**
Lightning	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0	**2**
Malaria	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	**3**
Paralysis	0	10	0	0	0	0	0	0	13	0	0	0	0	0	37	0	0	0	**5**
Snake Bite	0	10	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	**2**
Stomach Dies.	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	**2**
Suicide	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
TB	0	10	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
Typhoid	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	**1**
Unknown	24	0	0	0	0	0	50	0	0	40	0	50	25	0	0	0	0	12	**9**
Total	100	100	100	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	**100**

Source: Data Obtained From Village Survey



It is concluded that large number of deaths due to heart attack and accident are found most of the surveyed villages. Both are related with seasons. Rainfall is one of the cause of

motor cycle accidents, while extreme temperature is also are of the cause of heart attack deaths. Chart No. 3 and 4 are prepared to display at a glance reason of seasonal deaths and their causes.



Conclusion

1) The average deaths are reported during summer season (44%), followed by rainy season (38%) and in winter season (18%). Large proportions of deaths are reported in Rukhankheda, Khedi Kh., Mangalwadi and Kothe village. It is interesting to note that 100% of the total deaths are found in rainy season village Kothe. In summer season large number of deaths is reported in village Majare Hol (more than 50%), Hingone Sim (100%), Tarsod (61%) and Bhamalwadi (100%) of the total reported deaths. It is clear that summer and rainy seasons have large number of deaths in surveyed villages.
2) In the study villages 37% deaths are reported due to old age. Heart attack causes are found 17% of the total deaths, while accident cases are also alarming (10%). It is clear that 64% deaths are found due to over age, heart attack and accident. Remaining cases are insignificant.
3) The overall results of villages selected for case study clears the fact that human death rate is associated with summer and rainy seasons.

With the help of case study of 18 villages, in some extent human high death rate is associated with summer and rainy seasons.

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6. Sexist Culture in Laxman Gaikwad's the Branded

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Preliminaries

The status and position of women all over world is same. They have been oppressed, suppressed, marginalized, exploited, sold, raped, murdered and what not. In the 21st century, though they seem to be free, working in factories and offices, but they are still oppressed and exploited either for this reason or for that reason. In the context of class hierarchy, there is little difference, high class society women are less oppressed and exploited than the downtrodden Dalit women, but oppression and exploitation is there. A Tamil poetess Swarupa Rani rightly records her feelings as a dalit woman in her poem:

If male arrogance at home
Gives a resounding slap on one cheek
Caste dominance outside
Thrashes my other cheek
When I went into the fields to earn money by labor
When the landlord there
Lay in wait
To rob
Me as well as my sweat
I wanted to bury myself in the earth like seed
[Quoted in Lal & Others 2004:101]

The Status of Dalit Women

While reading the Dalit literature, especially, Dalit autobiographies, one definitely realizes the worst condition of Dalit women in their tribes and castes. The intention behind writing this paper is that how the Dalits in India have too created and maintained their own sexist culture as it was created and maintained by Blacks in America through their white masters. Clavin Herton rightly opines:

> Just as white people have created and maintained a racist culture, so have (Blacks) men created and maintained a sexist culture. Racist culture teaches all whites to be racist in some manner of the other. In and through an elaborate system of masculine versus feminine gender imperatives sexist culture socializes all men to be sexist.[1990:10].

Sexist Culture in Gaikwad's The Branded

While reading Laxman Gaikwad's autobiography *The Branded*, one definitely realizes that almost all the women depicted in the story are highly oppressed and exploited by their own people. It does not mean that they are not exploited by higher class people. Undoubtedly the Police and upper caste people are there, who too exploit them brutally. The great three factors are found—The Panchayat of Uchalya community, the Police department and the Husbands of their own women—who suppressed, oppressed, exploited, humiliated, raped, etc altogether. Throughout the book, almost each and every women minimum for one time is either arrested or beaten by the Police, the Panchayat also plays great role in harassing women under name of purity and Panchayat's self respect. The husbands do not hesitate while beating and suspecting their wives as it is their birth right. The autobiographer Laxman Gaikwad is also no exception to it. But this book also makes clear that the women are themselves both-- the victims and victimizers. It is Gaikwad's one of the sisters-in-law encourages him to beat his wife by saying, *"...a wife's place was at her husband's feet, much like the chappal's that's worn on the foot"*[2005:140].

Uchalya is a criminal community. The Police always get the chance of arresting and beating the thieves. When the Police come to investigate the crime, they make an excessive use of their power. Gaikwad compares them with the Yama. Gaikwad's mother Dhondabai has always been oppressed, and exploited by her own husband and the Police. Like her husband and Laxman Gaikwad, she never directly involves in stealing operations. But when the Police come to their hut, Gaikwad writes how they beat and molest the women in the hut, including his mother. She has to face such heart-rending situations many times in her life. Her husband named Martand always takes doubts about her. He always angrily tells her that his elder daughter Saru is not his daughter. He beats brutally her for every reason. Gaikwad narrates one incident, *"Father took my mother into the hut and forced her to do sit-ups. Then brought her out beating*

violently all the while"[Ibid:22]. Such a submissive, tolerant hard working mother of Gaikwad dies in her middle of life in want of medical treatment due to the abject poverty in the house.

Gaikwad's all the sisters-in-law also become the victims of the Police, the Panchayat and their own husbands. Their relative Elava comes to Latur for thieving business, after the theft Elava runs away, but Gaikwad's elder sister-in-law gets arrested by the Police, *" The police arrested my sister-in-law. My sister-in-law never indulges in thieving, she knew nothing about it…Moreover, they got good things to eat. Hence they allowed these thieves a temporary refuge"*[Ibid: 125]. The same sister-in-law named Kashibai gets badly insulted by the Panchayat. The whole family comes to Mahalangara to attend a marriage. Thread-winding ceremony at the time of bath to the Bride is in progress. Kashibai begins to wound the thread round the bawl, at that time; the villainous Panchayat takes objection that Kashibai's grandmother has run away with Maratha. Thus, the marriage ceremony is stopped. Finally, Gaikwad's father pays twenty-one rupees to the Panchayat as the fine to get purified and to get accepted back into community. Another sister-in-law, while sleeping at night outside the hut, an unknown person comes to her, and lay by her side. The stranger with a rough mauling action pressed down my sister-in-law, had intercourse with her and run away. Gaikwad has watched the whole drama of rape, but when another sister-in-law asks to her that if he has done anything with her. The raped sister-in-law replies that she does not allow him to sleep with her, but Gaikwad further writes, *"She (raped sister-in-law) knew full well what exactly the truth was. She has prevaricated because she was afraid that Bhau, her husband, would divorce her"*[Ibid: 86]. It is very pathetic that being the raped by the stranger, she even tells that nothing has happened because of the fear of her husband that he can divorce her.

The suppression of the women by the Panchayat has no end. Even the punishment awarded by it, seems to be very surprising and shocking. There is a person named Shankarya, The Panchayat has blamed that he has used his own daughter as his wife. The Panchayat gives shocking verdict on it, moreover as a punishment it was directed that Shankarya's moustache be shaved with the piss of his daughter. At the time of marriage of Kashibai's brother at Salgara, the Panchayat has an objection to the marriage because the girl's mother's mother had lived with a Maratha. So the girl's mother was born of a Maratha father. The Panchayat after much discussion gives punishment:

> At last one of the Panchas brought a razor, wetted the woman's (Bride's mother) hair with water and began to shave her head. The woman's heart wept mutely in her agony. The sin of the mother was visited on the Daughter. Even while the husband (her husband) was alive, the Panchas shaved her head clean. Not satisfied with that, the Panchas smeared her head with ochre. The bride's mother had pushed the end of her sari into her mouth, lest her weeping be heard [Ibid: 121].

Gaikwad also expresses his views on the tyranny of the Panchayat. He states: *"I found the functioning of the Panchayat obnoxious and disgusting. I was, small fry, however before this gigantic social monster"*[Ibid: 120].

Conclusion

The above discussion about the suppression, exploitation, oppression, humiliation of the Uchalya women makes clear that their own sexist culture in the form of monstrous Panchayat and husbands' jungle rule of abusing and beating is responsible for the wailing of their own women. The Police comes to their door-step because also of their criminal deeds. If they cannot stop their pilfering business, never mind, but they can stop their brutality on their own women, that will definitely relieve the Dalit women and they will have only bear the cruelty of the Police. Leela Dube very aptly writes in her research paper, Caste and Women: *"Caste is not dead. Gender is a live issue. The principles of caste inform the specific nature of sexual asymmetry in (Hindu) society; the boundaries and hierarchies of caste are articulated by gender"*[1996:21].

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7. Significance of Global Warming to Library and Information Experts

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Abstract

This paper considered global warming and its significance for library and information experts. The issue related with global warming was identified and solutions proposed. It concludes that the issue of climatechange adaptation should also be addressed through international cooperation and Libraries should includeglobal warming in user-education programs during orientation programs for fresh students in the IndianUniversities, global warming should be one of the points of emphasis and libraries ought to recycle their previous papers, instead of resorting to burning or discarding themto avoid fossil being emitted to the atmosphere.

Keywords: Global Warming, Green gas, Library; Climate Change, Fossil Fuels, Carbon Dioxide,etc.

1. Introduction

Climate change is that the shaping human development is ultimately concerning increasing human potential and enlarging human freedom. It is concerning individuals developing the capacities that empower them to create selections andto lead livesthat they value (UNDP, 2007). Climate change threatens to consume human freedom and bound choice.

Climate change is directly scientifically established truth. Today, we have a tendency to are witnessing at primary what can be the onset of vital human developmentreversal in our life time. The correct collision of greenhouse gas emission is notgentle to forecast and there is a lot of uncertainty in the science when it comes to predictive capability. But we nowknow enough to recognize that there are high risks, potentially catastrophic ones, along with the dissolution ice sheetson green land and the West Antarctic and modification in the course of Gulf Stream that would carry about drasticclimatic change. Climate change is already touching a number of the poorest and most vulnerable communities round the world. A world-wide 30 centigrade increase (compared to pre0industrial temperatures) over thecoming decades would result in a line

of localized increases that could reach twice as high in some locations.The effect is increased droughts, extreme weather events, tropical storms and seal level rises on large parts ofAsia. On diversSmall Island states and coastal zones will be administer to. But some of the world's poorest people,the consequences could be apocalyptic.

During the long move, climate change is a big threat to human development and in some areas it is already under runningthe international community's extreme poverty and efforts to reduce other consequences violent conflicts,insufficient resources, lack of coordination and weak policies continue to slow down development progress,particularly in Asia. How the world trades with climate change present dayswill have a direct bearing on human development prospects of a major section of humanity. Decline will consignthe poorest 40 percent of the world's population-some 2.6 billion people to a outlook of diminished opportunity.Consequently, governments and non-governmental organizations (NGOs) also locally, nationally and internationally arequickly looking at the effects of climate change on sundry aspects of life with view to mitigating and solvingthem.

This provides the motivation for the authors of this paper to address the significance of Global Warming on theLibrary and Information Experts. If climate change has caused on agriculture, business sand the wholenational economy, it must also have important issue on library and information materials, services and thepersonnel.

Objectives of the Study

The Study has the Following Objectives:

- To create awareness and sensitize information experts on Global Warming.
- To examine the significance of global warming on library and information experts in India.
- To suggest ways to combat the effects of climate change on library and information service.

2. Literature Review

The Concept of Global Warming

The term Global Warming refers, to the observation that the atmosphere near the earth's surface is warming. Thiswarming is one of many kinds of climate change the Earth has gone through in the past and will continue to gothrough in the future (NOAA Satellite and Information Services, 2008).

Increase in the global average surface temperature resulting from enhancement of the greenhouse effect, primarilyin air pollution. In 2007 the UN Inter governmental panel on climate change forecasted that by 2010 globalaverage surface temperatures would increase 3.2 – 7.20F (1.8 – 4.0C), depending on a range of scenarios for greenhouse gas emissions, and stated that it was 90 percent certain that most of the warming observed over the previoushalf century could be attributed to greenhouse gas emissions produced by human activities (i.e. industrialprocesses and transportation). Gases created through human industrial and agricultural practices (primarilycarbon dioxide from burning fossil fuels and wood, as well as methane, nitrous oxide, and chlorofluoro carbons)increase the heat-reflecting potential of the atmosphere, thereby raising the planet's average temperature.

Global warming is when the earth heats up (the temperature rises). It happens when greenhouse gases (carbondioxide, water vapor, nitrous oxide, and methane) trap heat and light form the sum in the earth's atmosphere,which increases the temperature. This hurts many people, animals and plants. Many cannot take the changes, sothey die.

3. Why is Global Warming Important?

Temperature increases will have significant impacts on human activities, including where we can live, what foodwe can grow, how and where we can grow food, and organisms we consider pests can thrives. To be prepared forthe effects of these potentials impacts we need to know how much the earth is warming, how long the Earth hasbeen warming, and what has caused the warming. Answers to these questions will not only provide us with abetter basis for making decision related to issues such as water resources and agricultural planning, it will alsoenable us to take precautions on the aspects it affects our profession.

4. What are the greenhouse Effects?

The greenhouse gases consequence is when the temperature growing as the sun's heat and light is trapped in the earth'satmosphere. This is as when heat is captured in a car. Upon a very hot day, the car gets hotter when it is out in theparking lot. This is as the heat and light from the sum can get into the car, by going through the atmosphere,but it can't get out. As a outcome, the temperature rises (World Almanac, 2000).

Our earth digests radiant energy from the sun and emits some of that energy back to space. The termgreenhouse effect describes how water vapor, carbon dioxide, and other greenhouse gases in the atmosphere reviserevert of energy to space, and in turn, change the

temperature at the Earth's Surface. These greenhouse gasesdigestfew of the energy that is emitted from the Earth's surface, preventing this energy from being lost tospace. Like a result, the lower atmosphere warms and delivers some of this energy reverse to the Earth's surface. Asthe energy is recover in this way, the earth's surface warms (National Climatic Data center, 2008). Although thegreenhouse effect makes the earth able to have people living on it, if there are too much gases, the earth can getunusually warmer, and many plant, animals and people will die. They will finish whereas there would be less food(crops like corn, wheat and other vegetables and fruits).

5. What are Green House Gases?

Greenhouse gases are gases inside the Earth's atmosphere that accumulate heart and light from the sun. Among too manygreenhouse gases in the air, the earth's atmosphere will grow too hot which lead to catastrophic effect onhuman, plants and animals.Greenhouse gases appear genuinely in the earth atmosphere, but are also being added by human activities. Thisincidents primarily direct the burning of fossils fuels, such as coal, oil and natural gas, which releases carbondioxide to the atmosphere. Several scientists have now decided that global warming can be explained by ahuman caused enhancement of the greenhouse effect (National Climate and Data Center, 2008; and United StatesEnvironmental Protection agency, 2001).

6. Global Warming and the Environment:

Global warming is affecting major parts of the world. Global warming composes the sea to rise, and when the searises, the water overlay many low land islands. This is a major problem for many of the plants, animals and people onislands. The water overlay the plants and causes some of them to finish. When plants and animals finish, people misstwo sources of food, plant food and animal food. People may also lose their homes. As a outcome, they would additionallyhave to leave the area of expire.

The oceans are caused by global warming in other was as well. With the oceans getting heated up, it is harmingand killing algae on the ocean. An alga is a producer that we can see drifting on top of the water. Algae extendfood for other animals through photosynthesis, and provide as food to many consumers in the ocean such as smallfishes, crabs, whales and may other animals. When the alga is demolished as a result of too much heat, it has voluteeffect on other animals in the sea, and consequently, man is affected. Global warming does not only seek plantsand animals in the sea, it is also demolishing many big forests. The pollution and causes

global warming is associatedto acid rain. Acid rain gradually destroys almost everything it touches. Global warming is linked to acid rain.Acid rain gradually destroys almost everything it touches. Global warming is also generate many more fires thatwipe out whole forests. Several plants and threes leaves can be so dry that they capture on fire. One of the extensivedilemmas concerning Global Warming is the cutting down of the rainforest for any argument. Plants naturallyabsorb carbon dioxide and give off oxygen in the procedure of photosynthesis, so the C02 is taken out of theatmosphere. We are cutting down forests, which decrease the number of trees that will take C02 out of theatmosphere, and also the C02 in the trees is released.

Causes of Global Warming

Many things cause global warming.The following elements of global warming have been described:

- Electrical pollution
- Burning of fossils fuels, e.g. oil and petroleum
- Destruction of carbon sinks on the Earth which (absorb and store) Carbon. The three major carbon dioxidesinks are: the atmosphere, the land and the oceans.
- The release of greenhouse gases, especially Co2 into the atmosphere, primarily through the use of fossil fuels.

7. Methane

A molecule of methane (CH4) traps 20 times as much heat as carbon dioxide molecule. Sources ofmethane include landfills, anural gas and petroleum systems, agriculture activities, coal mining, stationary andmobile combustion, waste water treatment, and certain industrial process.

Water Vapor is also a greenhouse gas. Like C02, water vapor traps heat and is a potent greenhouse gas.Warming will cause more water to evaporate, because the warmer air will hold more water vapor, which in turn,accelerates the rate of warming.

Clouds During the day, the clouds can shield the Earth form the sun's heat keeping the earth cooler. Or at night,clouds can trap the heat rising form the ground, making the Earth warmer.Some other examples of using energy and polluting the air are:

- Turning on a light
- Watching Television
- Listening to a stereo

- Washing or drying clothes
- Using a hair dryer
- Riding in a car
- Heating a meal in the microwave
- Using an air conditioner
- Playing a video game
- Using a dish washer (Web of creation 2006, power-score card, 2002, Think quest, 1999, and EcoBridge, 2009).

8. Consequences of Global Warming

The following are recognized consequences of global warming upon the Earth:

- It will change weather patterns. Where precipitation is greater than evaporation, there will be floods; whilewhere evaporation is greater than precipitation, there will be droughts.
- Alters the oceans. The whole ecosystem of the North Sea is in a state of collapse, "record sea temperatures arefinishing off the plankton on which all life in the sea depends, because they underpin the entire marine food chain.Fish stocks and sea bird population have slumped".
- It will modify Ecosystem and Habitat. In increase to habitat damage from urban sprawl and pollution, warming willalso be a major factor. A part of entire species of plants and land animals, or other than a million in all, couldbe driven to extinction". Solid extinction has accrued five times during the earth's history. The final one wasthe destruction of the dinosaurs, 65 million years before. Scientists are trading what is occurring now, the SixthMass Extinction.
- Public Health Issue. Heat will reduce the spread of infectious disease, heat, stress and also malnutritionbecause of its impact on agriculture. A heat wave in Europe finished an estimated 35,000 people.
- It will make Ice to melt and seas to Rise. The ice sheets in the two poles and Greenland, and in mountainglaciers about the world, are melting. The outcome is that the sea level has going to rise at a measurable andalarming rate. If the sea level reduces in the line imagine by the IPCC, many island nations, as well as all-lowlying. Inter-governmental Panel on Climate Change (PPCC).

- Scientists also say that the extreme weather phenomena such as floods, droughts, heat waves, cyclones anddissertation being experienced in different parts of the globe are among the far reaching consequences ofclimate change (Abutu, 2009).
- Abutu Alex (2009, Tuesday) climate change; between politics and Reality. Daily, Independent January, 13,page 7 Coastal areas, will be under water. The effects of sea level along the coast will cause flooding erosion,and saltwater intrusion into aquifers and fresh water habitats.
- Creates Abrupt Warming. Accessible proofrecognize that abrupt climate changes are not only achievable butlikely in the future, potentially with large impacts on ecosystems and societies.
- Generate Abrupt Cooling which is equally catastrophic. (EcoBridge, 2009).

9. The Library and Climate Change

Libraries all over the world have several factors justifying their existence. Libraries can be knowledge–Centre,information providers, cultural institutions, guardians of a ethical heritage as well as architecturally excitingmonuments that together with museums, religious centres and other significant buildings make up an importantpart of a city's profile (Cullhed, 2005).

A library is constantly a storage space for library materials and a working place for also personnel and patrons. Tobe adept to capably act its functions as a safe storage space for information, it is necessary to surround thecollections with technical systems which will protect the materials form damage and chemical breakdown thatdifferently would make the materials inaccessible in a near or distant future. Maintainance is therefore a core issuefor that information for the future. National Libraries Universities, public libraries as well as special librarieshave this liability.

Crucial factors for a prosperous protection of a library collection are for example, proper concern and handling,practical conservation treatments and digitization, or other means of duplicating. A disaster plan is essential, and,the perhaps the most active means of slowing down the chemical deterioration is storage of materials that are tobe kept for use both now and future, in climatically controlled Stacks. Chemical breakdown is measured to bedouble per every 10 (ten) degrees 0C, and low temperature storage is therefore ideal. High levels of humidity cancause mould in both the high and low temperature cause mould in both the high and low temperature range whichhas to be kept under control. During a hot and dry climate, desiccation

can cause expressive distortion in certainmaterials such as vellum. Therefore, in cognizance of the complications involved in climate control, IFLA guidelinesstates "in general, the library materials should be stored and used in stable condition such are not too hot, too dry,and not too dump". (IFLA, 2005).

9.1 Energy and Libraries

While the heat wave in Europe in the summer of 2003, technical systems were soiled on the breaking point inlibraries and other institutions in the cultural sector, which are dependent on an even preservation climate for thesafe guarding of their collections (culled, 2005). Structure such as the museum of advanced art in Vienna, with itsblack basalt stone façade, and the BibliothequeNationale in Paris with its glass towers, both had problemskeeping the temperature within reasonable levels. Within the European commission Fifth framework for research,which was completed in November, 2004, the issues of buildings of buildings and sustainable energy solutionswere addressed within the CUBART – Project or the European Architecture with associatedRenewable and RealTime user feedback. The innovative energy system contains the following elements:

- ✓ A highly insulated envelope
- ✓ Effective solar shading which uses natural elements such as trees and roof overhangs as well as shading bylouvers run by photovoltaic cells.
- ✓ A low rate of natural air infiltration
- ✓ An exposed internal concrete construction, which retains the heat,
- ✓ An efficient low-pressure mechanical ventilation system
- ✓ An electrically powered heat pump for heating via the air and thematically controlled perimeter radiators.During the summer, it cools the building, making further air conditioning and refrigerating unnecessary.
- ✓ Excess energy can be exported to adjacent buildings
- ✓ The energy is 100% renewable
- ✓ Compact fluorescent lighting, occupancy sensors and sun-shading devices are also used to improve energyefficiency.

Library architectures and library officers responsible for building design need to take into account that technicalsystems of a library need to be integrated with the construction of the building to combat and effect of climatechange.

9.2 Managing Risks through Information

Adapting to climate change involves managing risk by improving the quality of information and its use, providinginsurance against climate change risk, adopting known good practices to strengthen the resilience of vulnerablelivelihood systems, and finding new institutional and technological solutions. People in the insurance businessmake a clear distinction between certain and uncertain risks: a risk is certain if the probabilities of specific statesoccurring in the future are precisely known, and uncertain if these probabilities are not precisely known(kunreuther and Kerjan, 2006).

Talking about climate change, there is still much uncertainty about the probabilities of various possible changesoccurring in specific locations. This can be dealt with by investing in improved information to reduce the degreeof local uncertainty. Knowledge about the future high degree of uncertain, but the current high degree ofuncertainty about potential local impacts of climate change could be reduced through information collection,storage and dissemination.

Information is a critical implement in decision making, particularly in the matter of climate change where there is highuncertainty. The type of information, its source(s), to whom it is targeted, and how it is to be consumed are relevantelements in determining the impact and response that information may generate. Good and timely providedinformation about uncertainties and risks can make the difference between resilience and collapse for an unnaturallivelihood manner or ecosystem, as in the case of climate change.

While it has been scientifically demonstrated that climate is inconstant worldwide, not everyone has the sameunderstanding of, or places the same value on the significance of scientific results. For example, the climate datamade available to rural farmers do not often refer to regional information on climate and agriculture which contribute toresentment toward scientific data, or the abandonment of information that may have been helpful (Turton, 2001).This mismatch between understanding and interpretations of climate by farmers who rely on traditionalknowledge constitutes a very important challenge for information employees in terms of providing climate information for a spreadof decision makers, with differing education and resource levels (Roncoli, 2006).

10. Adaptation and Mitigation

Adaptation to global warming comprises of initiatives and measures to abate the vulnerability of natural andhuman systems against actual or expected climate change. According

to the former chief Scientific Adviser to theUK Government, David King, as cited by Wikipedia (2009), it is likely that adaptation to global warming isinevitable as it is thoughtful that levels of greenhouse gases can be held low enough to avoid a projectedtemperature rise of 20c.Climate change moderation is about transforming the way that we manufacture and use energy. It is almost livingwithin the limits of ecological sustainability (Human Development Report 2007/2008). Extremity, variability,and rates of exchange are key features in addressing vulnerability and adaptation to climate change. The capacity of human systems to adapt to and deal with climate change typically depends on such factorsas wealth, technology,education, information, skills, infrastructure, and access to resources, management capacities and sociopoliticalwill.

10.1 Why Adaptation?

Accommodation to climate change is essential principally for two reasons:

i. It is an approach to praise climate change mitigation attempts because it is sure that all climate change can beallayed.

ii. Arrangement has the possible to reduce adverse impacts of climate change and to enhance valuable impacts.There is implicit for more elite and less advantage countries to enhance and/or achieve adaptivecapabilities.

Adaptation is a policy consequence and the following principles should be advised when designing adaptation policy:

- The effects of climate change vary by region/various information resources.
- The effects of climate change may vary a cross demographic groups/personnel's
- Climate change poses both risks and opportunities
- Adaptive response varies in effectiveness.
- Adaptation is not without a cost.
- Many opportunities for adaptation meek sense whether or not the effects of climate change are realized.

10.2 Methods of Adaptation

Wikipedia (2009) highlighted some adaptation methods as follows:

- ✓ Planting drought tolerant crop varieties
- ✓ Spending more on irrigation
- ✓ Rain water storage

- ✓ Weather control through seeding clouds with chemicals to produce rain when and where needed
- ✓ Damming glacial lakes
- ✓ Geo engineering through techniques such as solar radiation management, greenhouse gas remediation,hydrological geo engineering
- ✓ Assisting disadvantaged nations.

11. Can We Stop Global Warming?

The question that may be agitating the minds of many could be "can we stop Global Warming, and its adverseeffects? "Yes, we can". Global warming is a dramatically urgent and serious problem such that we don't have towait for government to find a solution for this problem. Each individual can be of tremendous help adapting amore responsive lifestyle since global warming is human caused. Some little everyday things we can do include:

- ➢ Replacing a regular incandescent light bulb with a compact fluorescent light bulb thereby saving 300 pounds ofcarbon dioxide a year.
- ➢ Install a programmable thermostat which will automatically lower the heat or air conditioning at night and raisethem against in the morning.
- ➢ Clean or replace filters on your furnace and air conditioner. Cleaning a dirty air filter can save 350 pounds ofcarbon dioxide a year.
- ➢ Choose energy efficient appliances when making new purchases
- ➢ Do not leave appliances on standby
- ➢ Defrost old fridges and freezers regularly.
- ➢ Cover your pot when cooking
- ➢ Use less hot water because it takes a lot of energy to heat water to boiling point.
- ➢ Recycling at home (waste) is imperative&Recycle all the organic wastes.
- ➢ Planting trees
- ➢ Regularly maintain your cars &Choose more fuel efficient vehicles
- ➢ Fly less because aircrafts emit more carbon dioxide than cars.
- ➢ Protect and conserve forest worldwide.
- ➢ Carpooling. This is diving with someone to the same direction
- ➢ Do not turn on television, computer, and lights for a long time (Maurizio, 2009; Global warming, 2002).

11.1 International Cooperation on Global Change

If the world governments act now it will be possible to keep 21st century global temperature increases within a20C threshold above preindustrial levels. Achieving this will require a high level of leadership and unparalleledinternational cooperation. Climate Change threatens the entire human family. Hence it also provides anopportunity to come together and forge a collective response to a global problem (Ki-moon, 2007/2008).

Common action is not an option but an commanding. The world's atmosphere does not differentiate greenhousegasses by countries of origin. One tone of greenhouse gases from China carries identical weight in concert tone of greenhouse gases from the United States, andone Country's emissions are another country's climate changeproblem. It support that no one country can win the war against climate acting alone (Human DevelopmentReport 2007/2008 Dewar, 2009).

Yet, numerous governments are context bold targets for cutting greenhouse gases emissions. Climate changeremission has now registered securely on the agenda of the Group (G8) industrialized nations. And conversationbetween developed and developing countries is strengthening (Courtly, 2007, and Human Development Report2007/2008).

When government may acknowledge the realities of global warming, political action continues to fall far short of theminimum needed to resolve the climate change problem. The break between scientific apparent and politicalresponse remains large. In the advanced world, some countries have yet to settle ambitious targets for cuttinggreenhouse gas emissions. Others have set aim without putting in place and energy policy transformations needed toachieve them. The mysterious problem is that the world lacks clear, credible and long term multilateral frameworksthat chart a course for avoiding dangerous climate change.

Advanced countries have to take the lead, because they carry the strain of historic responsibility for the climatechange problem. They have the financial assets and technological capabilities to initiate deep and early cuts intransmission.The canon of "common but differentiated responsibility", one of the foundations of the Kyoto framework-doesnot intend that the developing countries should fold their hands and do nothing. The credibility of each multilateralagreement will turn on the participation of main emitters in the developing world. Hence, Bob Dewar (2009) said that coming yearwill be critical in global efforts to tackle climate change countries must act collectively to reduce carbonemissions as failure to do so will carry

upon the world "a human and economic" catastrophe that will make todaycrisis too small. Ubani (2009) averred that the future of every country depends on what they do to address climatechange, as the issue is remotely connected to energy use across the world.

12. Indian and Global Warming

Indications are Indiamay be at the receiving end of negative impacts of global warming. Onyedika andOkoronkwo (2009) posit that a study decided currently have shown several indicators of variables that increasegreenhouse gases, which is the major causes of climate change are very general and at high volume in thecountry. What is worrisome is the low level of awareness about climate change or global warming in India.The study on climate change and perception of Indian revealed that about 1.45 billion people in Asia wouldbe exposed to increased water stress due to climate change by 2020 while yields form rain-fed agriculture couldbe subdued by up to 50 percent. The study further revealed that in India:

- Awareness of climate change is low
- Most Indians associated climate change with weather.
- Most Indians do not connect local issues such as desertification, coastal flooding, gulley erosion andurbanization to climate change
- There is little evidence of Indian staking substantive steps to adapt to the effect of climate change.
- Most Indians are not empowered to address environmental issues and responsibility for dealing with thoseproblems is often attributed to the government
- Indians want practical, local information that is ground in local examples of how to address environmentalchallenges they face.

Lack of awareness of climate change by most Indians is largely due to death of information and the governmentinsensitivity to this-all important topical issue. This poses a challenge to library and information workers not onlyto collect relevant resources on climate change but also collaborate with other media to disseminate informationabout the problem of global warming. A media meeting held on the 27th of May, 2008; at Abuja recognized thevital role of the media in all developmental initiatives. Active information dissemination and networkingis no mistrust enhances people's knowledge based for proactive engagement on climate change and its effects, andcreates a sound formulation and action on climate change adaptation (Building Indian's Response to climatechange, 2008). Such the National House of

representative has for the first time set up a standing committee onclimate change to bring the issue to the front burners is a clear portrayal of insensitivity to this world's threateningproblem (Nzeshi, 2009).

13. Conclusion

Climate change is an effect that cannot be cleared overnight, or with any one policy. It is an intergenerationalproblem which needs to be addressed by ensuring that all policies which impact on how we live on this planettakes climate change seriously into account. This requires acting with a sense of urgency. The beginning point foraction and political leadership is acceptance on the part of governments that they are confronted by what may bethe gravest threat ever to have faced humanity.

As superiority, the world needs a binding international contract to cut greenhouse gas emissions across a longtime horizon. The developing countries have to be party to that agreement to make commitments to reduceemissions. All multilateral agreement without quantitative commitments from elaborative countries will lackcredibility in terms of climate change mitigation. At the equal time, such contract should incorporate provisionsfor finance and technology transfer from the rich nations that bear historic responsibility for climate change. Theconsequence of climate change adaptation should also be treated through international cooperation. Governmentsshould make provision for national carbon budgets. Carbon budgeting approved by radical energy policy reformsand government action to change incentives structures for customers and investors is the foundation for effectiveclimate change mitigation (Human Developing Report 2007/2008).

In a equatorial climate, it is exorbitant heat and dampness that pose a threat to library collections and huge sums ofmoney is being spent on air-conditioning to present the decline of library collections which is created by mould andheat. Library buildings should be created using advanced technology with excellent systems to cope for thebenefit of preserving library collections equipment and personnel.

- Libraries should include global warming in user-education programs. During orientation programme for freshstudents in the Indian Universities, global warming should be one of the points of emphasis.
- Libraries should recycle their old papers, rather than resorting to burning or dropping them to avert fossilbeing emitted to the atmosphere.

- ❖ Libraries should check weather alerts and warnings from the National Weather Service and disseminateinformation to help individuals, communities and business plan for and reduce the effects of extreme heat.
- ❖ Libraries and their management should ensure that their staff work in an air conditioned environment in order toavoid heat wave and stay healthy. This presupposes that all the necessary infrastructures should be in place.
- ❖ In time of power outages, staff should stay out of extremely hot office and take fresh air outside, take plenty offluids, wear light clothing, etc.
- ❖ More pragmatic approach should be given to awareness campaign on global warming by the government both atFederal, State and local levels.
- ❖ Awareness campaign should be carried to schools, market places and motor parks with emphasis on the role ofindividuals at mitigating the effects of climate change.
- ❖ At school level, young people should be encouraged to be involved through formation of Climate ChangeClubs, societies, etc.
- ❖ To further drive home the message on global warming, programs should be regularly organized in both radioand television programs in local languages of various ethnic groups in India.
- ❖ As part of the government's effort at combating global warming effects, environmental sanitation exercisewhich is observed monthly should be given legislative backing to achieve the much desired result.
- ❖ Climate Change should be include in the school curriculum and taught as a subject. This is to make the youngpeople realize the significance of global warming early in life.

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8. Socio-Economic Status of Population in Anjani River Basin of Jalgaon District

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Abstract

In human life water is an acquired a great importance, without water man does not perform any action. All phenomenon's of human beings are depended on water availability. On the earth surface about 70.8% proportion acquired by water and 29.2% by land. Out of 100% water only 1 **%** is the surface running water in the forms of rivers. Human civilization was developed and spread all over from major river basin. Hence, the importance or river basin is also great interested study topic. In Jalgaon district of Maharashtra state has a great important region in the countryside. River Anjani is flowing in the western part of the district. River Anjani is the one of main tributary of River Girna and river Girna is the main tributary of river Tapi. Objective of the present research study to find out the socio economic conditions in Anjani river basin on the present days. The present study conducted will be based on surveying method. Researcher will arrange a survey for the collection of data for analyzing and interpretation of present study. In the study region 27 villages are affected by Anjani river project out of them 1 is tahsil place.

Present study reveals, social and economical components affect the development of the region. In Anjani river basin area having distinct physical setting as well social variations was responsible diverse occupational structure. Different religious group population having different sex ratio, literacy, occupational status, living standards and having income.

Key Words : Sex Ratio, Literacy, Religion, Caste, Occupation

Introduction

On the earth surface various natural resources are formed from origin of the earth. Out of them water is the main natural resources. Availability of the water is main cause for origin of life on the earth. Hence, an earth is known also water planet or green planet.

In human life water is an acquired a great importance, without water man does not perform any action. All phenomenon's of human beings are depended on water availability. On the earth surface about 70.8% proportion acquired by water and 29.2% by land. Out of 100% water only 1 **%** is the surface running water in the forms of rivers.

The river system is occupied a great natural as well as cultural importance in any region on the earth surface. Human civilization was developed and spread all over from major river basin. Hence, the importance or river basin is also great interested study topic. In Jalgaon district of Maharashtra state has a great important region in the countryside. River Anjani is flowing in the western part of the district. River Anjani is the one of main tributary of River Girna and river Girna is the main tributary of river Tapi.

Objectives of Research Work

To find out the socio-economic conditions in Anjani river basin on the present days.

Research Methodology

The present study conducted will be based on surveying method. Researcher will arrange a survey for the collection of data for analyzing and interpretation of present study. In the study region 27 villages are affected by Anjani river project out of them 2 are Tahsil place all researcher has prepared a questionnaires for getting information about village and their own socio economic characteristics, and he will be filled from village Panchayat office of hat village.

Researcher will be prepared another questionnaires 4 village, those are migrated from their original location due to the construction of Anjani project from these questionnaires information getting about rehabilitation facilities in this village and the evaluation of quality of socio-economic conditions of the population in these village. Geographical, Geomorphological, Cultural information and data will be collect from SOI topographical maps, Satellite imaginaries, and remote sensing data and interpret them with the help of GIS.

Study Region

Anjani River is tributary of Girna River which is itself a major tributary of Tapi river in part of Maharashtra state, India. Anjani River originates near Achalgaon village in Bhalgaon Tahasil of Jalgaon District. Its coordinate is Longitude $75^0$09'E - $75^0$20'E. and Latitude $20^0$45'N – $21^0$08'N. confluence of Girna and Anjani River near Babhulgaon Village of Dharangaon. Total Length Is Approx 50Km. Average Elevation 171meter (561feet) Confluence Of Girana – Anjani River Is Near Babhulgaon Village In The Dharangaon Taluka The Northern Boundary Of

Jalgaon District. The Catchments Areas of the Anjani Basin Covers 911.71Km^2.Anjani River Is Oriented In south to north Direction.

Analysis

Socio-Economical status of inhabitants is a mirror of development of the region. In India, development of rural area is fully depending upon the practices and activities of agricultural sector. Agricultural practices made on topography, climate, soil, irrigation and other related components. In Anjani river basin, some natural as well as cultural factors are found suitable for the development of the region. Social and economical status of the population is depending on natural factors found in the region and inversely socio-economic changes are responsible for the changing development pattern of the concerned region.

Table No.1.1 Population in Villages of Anjani River Basin

Sr. No	Village Name	1951	1961	1971	1981	1991	2001	2011
1	Umare	106	135	242	278	403	480	692
2	Malkhede	147	191	263	371	419	465	738
3	Fharkande	1244	1308	1783	2086	2341	2163	2285
4	Nandkhurde Bk.	168	175	205	422	553	734	1025
5	Sonbardi	212	257	216	598	1192	1317	1650
6	Hanumntkhede Bk.	516	622	729	788	779	709	743
7	Dharagir	419	475	566	588	1075	1216	1157
8	Erandol (Urban)	15042	16619	18905	22797	27730	30120	135450
9	Jawkhede Bk.	534	610	780	1162	1298	1448	1386
10	Jawkhede Kh.	686	797	1052	1335	1304	1519	1628
11	Kalyane Bk.	188	168	219	342	423	374	522
12	Kalyane Kh.	598	788	968	1367	1344	1448	1560
13	Kalyane Hol	456	502	618	876	996	1035	1291
14	Hingona Bk.	701	812	1017	1291	1543	1564	1430
15	Hingona Kh.	384	424	588	777	869	990	1128
16	Pimpri Kh.	798	936	1412	2306	2748	3340	4251
17	Chawalkhede	250	296	511	691	792	975	1193
18	Waghlud Bk.	394	549	782	1052	1027	1054	1089
19	Satkhede	585	663	1007	1190	1168	1691	1941
20	Sonwad Bk.	1411	1619	1868	2442	2756	2640	2769
21	Sonwad Kh.	355	371	465	643	710	719	727
22	Ahire Kh.	183	263	329	335	422	379	513
23	Ukhadwadi.	197	314	350	431	388	550	618
24	Babhulgaon.	603	771	958	1094	1031	992	1177
25	Bhamrdi.	148	261	378	359	478	674	914

Here table shows the population in 24 villages and one urban area of Anjani river basin. Population of the village is depend on the area of village, acquired agricultural area. Only Erandol urban area having most population due to their significance of Tahsil place. On the other hand Pimpri Kh, Sonawand Bk. and Farkande villages having large size population in the river basin. In 1951, Pimpri Kh. Village having low population (798) than other villages, but in year 2011 Pimpri Kh having toppest population (4251) in the study area.

Table No. 1.2 Religion Wise Sex Ratio

Religion	Total number of family	Sample population		Sex Ratio	Boys	Girl	Child Sex Ratio
		Male	female				
Hindu	194	449	392	873	255	198	776
Muslim	23	58	65	1120	36	43	1194
Buddhist	41	77	87	1129	36	46	1277
Jain	02	03	03	1000	01	01	1000
Total	260	587	547	932	328	288	878

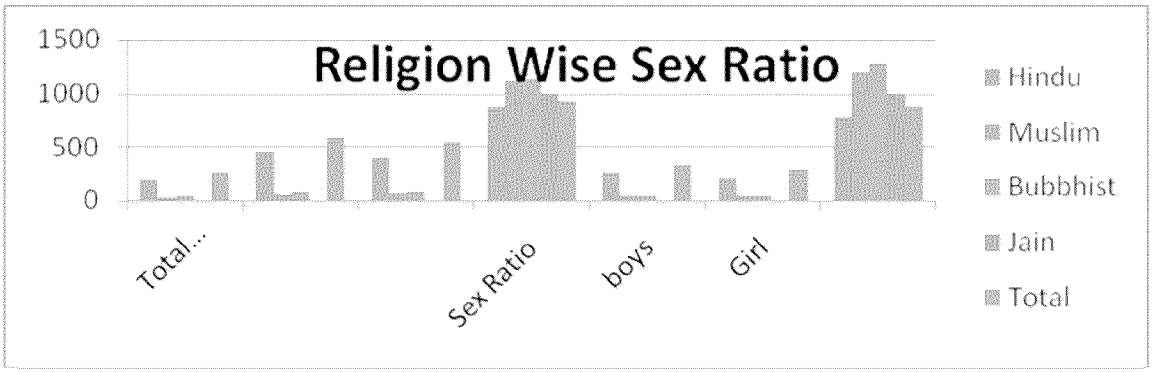


Table represents out of 260 families in the study region having different sex ratio by measuring their religious status. In the study region Hindu religion having low sex ratio (776) than Muslims, Buddhists and Jains. Child sex ratio for the Muslim and Buddhist religion was still high than the overall sex ratio. Jains community having stable sex ratio for children's as well as overall.

Table No. 1.3 Caste wise Sex Ratio

Caste	**Total number of family**	**Sample population**		**Sex Ratio**	**Boys**	**Girl**	**Child Sex Ratio**
		Male	**female**				
SC	41	77	87	1129	36	46	1277
ST	32	73	76	1041	42	43	1024
NT	13	36	40	1111	25	26	1040

OBC	112	245	213	869	132	103	780
OPEN	62	156	131	840	93	70	753
Total	260	587	547	932	328	288	878

Table shows, OBC and Others community having low sex ratio for overall and children's than SC, ST, NT and average. Average sex ratio was 932 in the Anjani river basin.

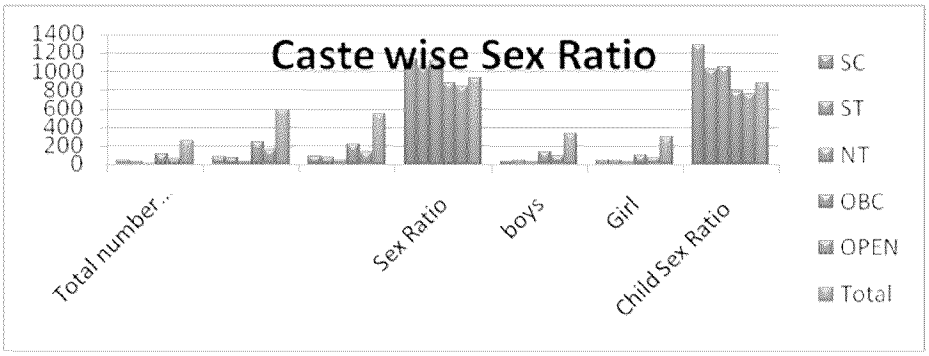
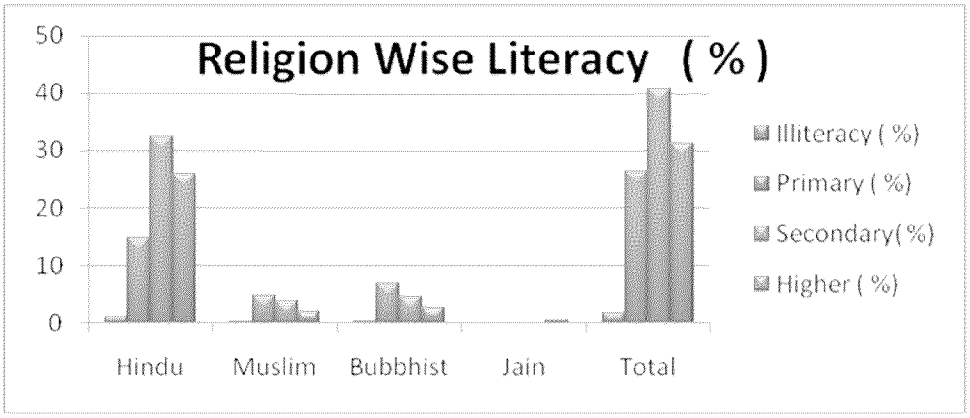


Table No. 1.3 Religion Wise Literacy (%)

Religion	**Illiteracy (%)**	**Primary (%)**	**Secondary (%)**	**Higher (%)**
Hindu	1.15	14.73	32.28	26.01
Muslim	0.26	4.76	3.79	2.02
Buddhist	0.44	6.79	4.59	2.65
Jain	0.00	0.00	0.00	0.53
Total	1.85	26.28	40.65	31.21



Graph represents, religion wise literacy in the study region. Variation was found in literacy rate for different religion population. Hindu religion population having high literacy rate (73.02 %) in the study region than the other religious groups. Higher education was recorded highest in Jains religious population followed by Hindu, Buddhist and Muslim religious population.

Table No. 1.5 Caste wise Literacy (%)

Caste	Illiteracy (%)	Primary (%)	Secondary (%)	Higher (%)
SC	0.44	6.79	4.59	2.65
ST	0.26	2.02	10.05	0.79
NT	0.09	1.32	4.67	0.61
OBC	0.79	9.08	10.49	20.01
OPEN	0.26	7.05	10.84	7.14
Total	1.85	26.28	40.65	31.21

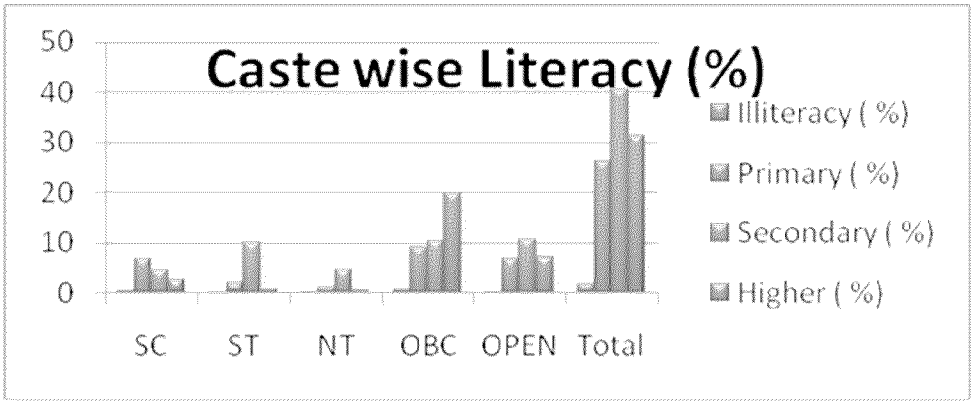
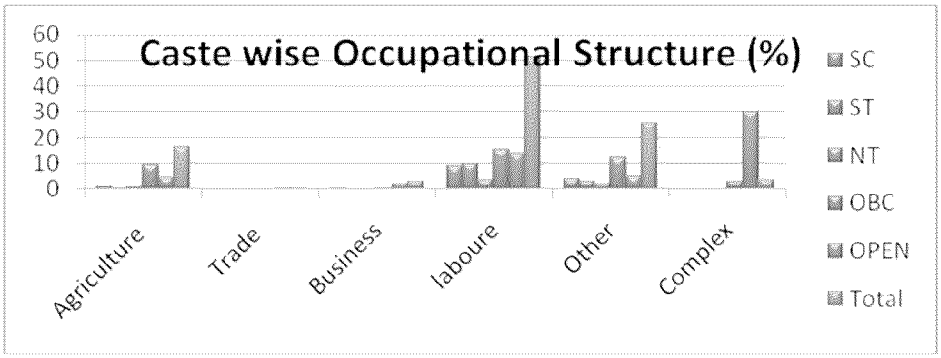


Table shows, caste wise literacy in the study region. Variation was found in literacy rate for different caste group. OBC population having high literacy rate in the study region than the other caste groups. Open, Scheduled Caste, Scheduled Tribe and Nomadic Tribe population having low literacy in the study region .

Table No. 1.6 Caste wise Occupational Structure (%)

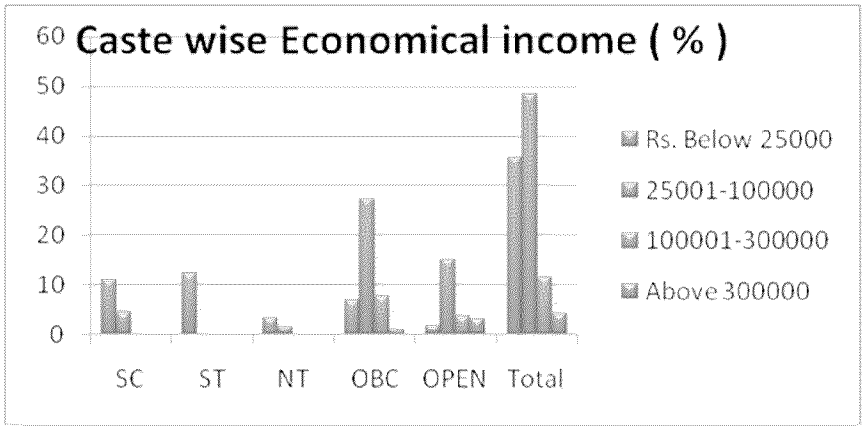
Caste	Agriculture	Trade	Business	laboure	Other	Complex
SC	1.15	0.00	0.44	8.99	3.79	0.09
ST	0.44	0.00	0.00	9.88	2.82	0.00
NT	0.79	0.00	0.09	3.53	2.20	0.09
OBC	9.52	0.00	0.44	15.25	12.17	3.0
OPEN	4.23	0.26	2.02	13.76	4.76	30.26
Total	16.14	0.26	3.0	51.41	25.75	3.44



Maximum population was engaged in agricultural sector in the nature of labour. Fertile soil, availability of water, irrigation facilities are the responsible employment in agriculture throughout the year. Other marginal workers found in large proportion followed by agricultural farmers. In rural area trade and business sector was not developed and don't gaining employment chances. Social aspects impact on their occupational structure in the study region.

Table No. 1.7 Caste wise Economical income in Rs. (%)

Caste	**< 25000**	**25001-100000**	**100001-300000**	**Above 300000**
SC	11.15	4.62	0.00	0.00
ST	12.31	0.00	0.00	0.00
NT	3.46	1.54	0.00	0.00
OBC	6.92	27.31	7.69	1.15
OPEN	1.92	15.0	3.85	3.08
Total	35.77	48.46	11.54	4.23



Here clearly shows that the social impact on occupational structure of the population in the study region. Occupational structure affect on their income. Maximum income reaches by the OBC and Open community groups followed by SC, NT and ST population groups. Agricultural farmers having marginally high income than the agricultural or industrial labourers. Overall one third population (35.77%) having annual income below Rs. 25000/-. It means that about 35 % population in the study region comprises Below Poverty Line (BPL).

Conclusion

Conclusion of the present study social and economical components affect the development of the region. In Anjani river basin area having distinct physical setting as well social variations was responsible diverse occupational structure. Different religious group population having different sex ratio, literacy, occupational status, living standards and having income. Overall that condition was favourable for the agricultural development in the rural area. Because in India, agriculture is the primary and main employment sector to the population.

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9. Diversity of Family Solanaceae from Forest Area of Navapur Taluka, Nandurbar District, (MS)

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Abstract

Solanaceae is important family of flowering plant. The present study deals with diversity of family Solanaceae from forest area of Navapur Taluka, Nandurbar District (MS). The forest of this area is mainly dry deciduous type. It is a part Western Ghats. The flora of this region is highly diversified in vegetation, rich in floristic composition and contains considerable number of important species.

Key words: Diversity, Solanaceae, Forest, Navapur, Nandurbar.

Introduction

The Family Solanaceae is commonly called night shade or Dhatura family consist of about 98 genera and more than 2700 species distributed all over the world. About 21 genera and 88 species are found in India with great diversity of habitat Morphology, Ecology etc. The members of this family are annuals, biennials or perennials and are usually herbs, shrubs and trees. The objective of the study is To study of diversity especially morphology of family Solanaceae from forest area of Navapur Taluka, Nandurbar District (MS). The present paper deals with morphological descriptions of 5 genera and 11 species of family Solanaceae. It has been tabularised in table. It includes alphabetically arranged botanical names , local names and morphological description.

About Study Area

Navapur is one of the six taluka of Nandurbar. It is located between 21°09'-21°15' latitude 73°48'-70°80' longitude of Nandurbar district. It is very pleasant place surrounded by hills of dense forest of Northern Western Ghat from one side. The forest is intermixed with hamlets and villages

Material and Methods

The present study carried out by critical field survey in the different parts, of forest area of Navapur taluka, Nandurbar District. During the time of Field survey, Several places have been

visited and information was collected from elderly persons, tribal peoples etc. The collected plant specimens was dried, pressed to prepare Herbarium. They are identified and deposited in the herbarium of Department of Botany, Jaihind Educational Trust's Z.B. Patil College, Dhule.

Sr. no.	**Botanical name**	**Local name**	**Morphological Description**
1	*Datura innoxia* Mill	Dhotra	It is stout herb 0.8 to 1.2 m tall. Stem is branched, densely tomentose , hairy. Leaves broadly ovate 9.2 - 16.2. × 5.5-8.8, hairy, entire, slightly sinuate or irregularly lobed at the base, petiolate, flowers axillary terminal cymose. Pedicilate, white, persistence calyx, corolla infundibuliform, 12-18cm long, fruit is globose spiny capsule 3.5-5.6 across, dehiscent. Seeds glabrous reniform pale to dark brown.
2	*Datura metal* L.	Kala Dhotra	Erect, glabrous & stout herb up to 60-91 cm tall. Stem is herbaceous, hollow with strong odour, purple. Leaves simple 11-16×8-10.5 cm, alternate petiolate, exstipulate, entire or deeply lobed, glabrous. Flowers axillary solitary, white, calyx persistent, corolla infundibuliform. Fruit globose capsule 2-3 cm across covered with numerous straight spines. Seeds-orbicular glabrous, flat, smooth endospermous.
3	*Nicandra physalodes* (L)	Goti, Fokala-andu	Erect leafy herb up to 1m tall. Stem is erect, glabrous, with spreading branches. Leaves 5-14×3-7 cm, ovate-oblong, toothed, glabrous, acute. Flowers solitary, axillary, bluish-white, pedecilate, bell-shaped, 3-5 cm in diameter. Fruit berries, globose enveloped by inflated persistent calyx. Seeds numerous, minute, testa thick, brown.
4	*Physalis angulata* L.	Popti	Erect branched herb, 80-150 cm tall. Stem is glabrous, angular, ribbed. Leaves 3-14×2-9 cm ovate, elliptic, acuminate, cuneate or rounded at the base, petiole 3-4 cm long. Flowers solitary, terminal, seemingly axillary, 5 sided pale yellow, 5 small brown spot within. Seeds

			reinform, flat, pale yellow.
5	*Physalis minima* L.	Ran popti, Chirboti	Erect herb up to 25-50 cm tall. Stem profusely branched, angular, glabrous or pubescent. Leaves 2.5-12×1.5-5 cm, broadly ovate elliptic-oblong, soft, smooth, entire or serrate, petioles 0.5-3.5 cm long. Flowers solitary, axillary, pale yellow, 0.5-1.0 cm across peduncle 1.0-2.0 cm long. Fruit berries, globose, 1.0-1.4 cm across glabrous, encapsulated in papery cover, orange yellow.
6	*Solanum anguivi* Lamk	Ringni, Deoringni	Under shrub, stout, 50-140 cm tall, hairy. Stem branched, often purple, densely stellate tomentose. Leaves 5.0-13.2×2.1-8.1 cm broadly ovate, sub entire or irregularly dentate, acute, petiolate. Flower purple, 1.0-1.5 cm across, pedecillate, calyx hairy, corolla rotate 0.8-1.2 cm long. Fruit berry, globous 0.7-1.0 cm across, glabrous, orange-red. Seeds numerous, flat, smooth, oblong, or spherical, rarely sub reinform, yellow.
7	*Solanum incanum* L.	Ubhi-ringni	Under shrub up to 150-200 cm tall. Stem is stout branched, densely clothed with stellate hairs. Leaves 4.5-12×1.9-5.8 cm, ovate, slightly wavy, acute, stellate hairs on both sides, petioles 0.5-2.5 cm prickly on the veins. Flowers purple-white, 1.1-1.6 cm across, calyx fused, corolla bell or wheel shaped. Fruit berries 1.5-2 cm across, globose yellow on ripe. Seeds many green to orange-red.
8	*Solanum nigum* L.	Kamuni	Erect herb, 40-70 cm tall. Stem branched, branches often purple-green, glabrous or sparsely hairy. Leaves broadly ovate 1.2-8.1×0.8-4.9 cm, entire or crenate, acute, sparsely hairy on both surface, petiolate. Flowers creamy-white 0.6-1.1 cm across, 3-8 in extra axillary,sub umbellate cymes, peduncle 0.6-1.1 cm long, pedicellate, corolla rotate. Fruit berries 0.5-0.8 cm across, globular, dull black or purplish-black. Seeds numerous small yellowish-brown.

9	*Solanum surattense* Burm	Guiri	Prickly diffused herb, heavily armed, spreading. Stem branched, dense stellate tomentum. Leaves 5.5-10.6×1.5-6.2 cm, ovate, elliptic or ablong, stellate hairs on both sides, petioles 0.6-2.5 cm long. Flowers bluish-violet, 1.4-1.6 cm across, in extra axillary, pauci florous cyme, pedicellate, calyx densely hairy and prickly, corolla rotate. Fruit berries 1.2-2.0 cm across, globous covered by enlarged calyx, yellowish-red. Seeds many, sub-renyform, yellowish-brown.
10	*Solanum virginianum* L.	Bhuiringni, Ran-wange	Diffuse or prostrate herb, 40-60 cm tall. Stem zig-zag, clothed with stellate hairs armed with sharp straight needle like broad based yellow prickles 0.4-2 ×0.05-0.15 cm. Leaves unequal paired, prickly ovate-oblong 5-11×2.5-5cm, armed sinuate, acute. Flowers purple-blue, 1.5-2.5 cm across, in extra axillary few flower cymes or solitary. Fruits berries, 1.2-2.2 cm across, globose, pale yellow. Seeds reinform, pale yellow.
11	*Withania somnifera* (L)	Ashwagandha	Erect under shrub 70-180 cm tall. Stem is branched, hairy, leaves 5.0-9.5×3.2-5.0 cm, ovate, entire to slightly wavy, sub acute, hairless above and densely hairy below, petioles 0.8-1.5 cm. Flower small 1-7 in sessile or sub sessile umbellate cyme, greenish-yellow. Fruit berries 0.5-0.8 cm across, globose, slightly 5 angled, orange-red. Seeds numerous, oblong or spherical, smooth, pale yellow.

Result and Discussion

The present study deals with diversity especially morphology of 5 genus and 11 species of family Solanaceae from forest area of Navapur Taluka, Nandurbar District (MS). The most dominant genera are *Solanum, Datura* and *Physalis.*

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10. Some Common Aquatic Plants of Dudhana Dam Jalna District, Marathwada, Maharashtra

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Abstract

The paper deals with the report on some of the more common aquatic plants of Beed district. The data like general vegetation pattern of the ponds, lakes, pH of water etc. have been presented together with the enumeration of 25 plants collected by Dudhana Dam district.

Key world: Aquatic plants, Beed district, Marathwada.

Introduction

This part of the Taluka Partur Dist. Jalna. Partur is birth place of bhakt pralhad the son of hiranya kashku located at 19.35°N 76.12°E.(District Website). It has an average elevation of 439 metres (1440 feet). Godavari is major river flows through various villages of Partur. Near Dudhana river Upper Dudhana Dam. Bageshvari Sugar Factory, Warfal in Partur.

The Lower Dudhna Major Irrigation Project is being constructed in the Godavari basin in Parbhani district of Maharashtra. The project comprises of the following components.

i. 6581.20 m long earth dam with the maximum height of 18.52 m and 438.80 m long masonry/concrete dam of the maximum height of 28.60 m having 65 m long left non-overflow blocks, 303.30 m long gated spillway and 70.50 m long right non-overflow blocks across river Dudhna near Brahma-Wakdi village in Selu Taluka of Parbhani district.

ii. Two head regulators for two canals constructed on left flank and right flank.

iii. 69 km long Left Bank Canal (LBC) and 48 km long Right Bank Canal (RBC) having head discharge of 8.50 m3/s and 6.90 m3/s respectively.

iv. Distribution network on LBC and RBC to irrigate CCA of 38264 ha in Parbhani and Jalna districts out of which 801 ha lies in Jalna. The canal system will create the annual ultimate irrigation potential of 44482 ha in Parbhani and Jalna districts, of which 932 ha is in Jalna.

vi. The project will also provide 6.44 Mm3 water for domestic use and 1.64 Mm3 water for industrial use.

Most of them harbor a luxuriant plant wealth mostly dominated by **Nymphaea nauchali, Nymphaea pubescens, Nelumbo nucifera, Potamogeton nodosus, Aponogeton natans** with their leaves floating and covering more or less entire surface of water. With these dominants there grown a large number of submerged aqautics and marginal. The submerged ones includes **Vallisnaria spiralis, Hydrilla verticillata, Najas graminea, Nechamandra alternifolia** etc. while the common marginals include **Typha angustata**, several numbers of sedges and grasses, **Phylla nodiflora Bacopa monnieri** and others.

During our field survey, many taxa were collected from Dudhana Dam. Specimens were brought to laboratory and processed for herbarium specimens with standard procedures. Majority of the specimens were satisfactorily identified by using pertinent literature Naik *et al.* (1998). After critical investigations authors found that many taxa are not reported from the region. Following is the enumeration of common aquatic plants collected during the year, together with their updated nomenclature, family, flowering and fruiting season, exsiccata, localities, and short description. The classification and sequence adopted here is that of APG system.

This paper deals with some of the preliminary observation made during the year, together with an enumeration of more common aquatic plants of the area.

Enumeration

Nymphaea nouchali Burm. f. Fl. Ind. 120. 1768; Mitra in Sharma et al. Fl. India 1: 430. 1993. *N. stellate* willd. Sp. Pl. 2: 1153. 1799; Hook.f. &Thoms.In Hook.f. Fl. Brit. India 1: 114. 1872; Cooke, Fl. Pres. Bombay 1: 27. 1958 (Repr.). '*Uplia Kamal'*. **(Nymphaeaceae). Plate-I, A.**

Aquatic herbs; root stock short, ovoid, acute. Leaves 20-30 x 15-25 cm, orbicular or elliptic, peltate, green above, purpulis below; petioles slender. Flowers white or red, 7-15 cm across, solitary. Nutlets globular. Seeds longitudinaly striate. *Exsiccata*: SAS; 9147.

Fls. & Frts.: Throughout the year *Locality:* Upper Dudhana

Nymphaea pubescens Willd Sp. Pl. 2: 1154. 1799; Mitra in Sharma et al. Fl. India 1: 430. 1993. *N. lotus* auct. Non L. 1753; Hook.f. & Thoms. Fl. India 241. 1855; Cooke, Fl. Pres. Bombay 1: 27. 1958 (Repr.). *'Kamal'*. **(Nymphaeaceae). Plate-I, B.**

Aquatic herbs; root stock short, ovoid, erect. Roundish, tuberous. Leaves 15-25 cm, across, orbicular or reniform-sagitate deeply cordate. Flowers red, pale rose or white, 7-20 cm across, solitary. Nutlets fleshy globose. Seeds ovoid rough. *Exsiccata*: SAS; 9148

Fls. &Frts.: Throughout the year *Locality:* Upper Dudhana

Nelumbo nucifera Gaertn. Fruct.1: 73, t. 19, f. 2.1788; Subram. Aq. Ang. 8, 116, f. 4. 1962; Mitra in Sharma et al. Fl. India 1: 430. 1993. *Nelumbium speciosum* Willd Sp. Pl. 2: 1158. 1799; Hook.f. & Thoms.In Hook.f. Fl. Brit. India 1: 116. 1872; Cooke, Fl. Pres. Bombay 1: 28. 1958 (Repr.) . *'Kamal'*. **(Nelumbonaceae) Plate-I, C.**

Aquatic herbs; rhizomes slender elongate, creeping, branched. Leaves 0.3-0.9 m across, glossy or waxy, glaucus beneath, radiatingly reticulate. Flowers white or rosy, 10-25 cm across, solitary, erect or cernous; scape sheathing, as long as petioles. Ripe carpels 1.25 cm long, ovoid, glabrous; nutlets smooth. *Exsiccata*: SAS; 9159

Fls. &Frts.: July-October *Locality*: Upper Dudhana

Cleome chelidonii L. f. Suppl. Pl. 300.1781; Hook.f. &Thoms.in Hook. f. Fl. Brit. India 1: 170. 1872; Cooke, Fl. Pres. Bombay 1: 42. 1958 (Repr.); Jacobs in Steenis Fl. Males 1, 6: 102. 1960; Raghavan in Sharma et al. Fl. India 2: 306, f. 58. 1993. **(Cleomaceae) Plate-I, D.**

Annual herbs, 30-60 cm tall, strate. Leaves 3-7 foliolate below and simple above; leaflet 2-5 x 0.5-0.7 cm oblong-obovate below and narrow-linear above. Flowers in axillary and terminal racemes. Capsules 5-8 cm long, cylindric, slender, tapering at both ends. Seeds yellowish-brown. *Exsiccata*: SAS; 9162

Fls. &Frts.: July-October *Locality*: Lower Dudhana

Sesbania bispinosa (Jacq.) W. F. Wight, in U. S. Dept. Agric. Bur. Pl. Ind. Bull. 137.15.1909; *Aeschynomene bispinosa* Jacq. Ic. Rar. 3:13 t. 564.1792; Lakshmin. & B.D. Sharma Fl. Nashik Dt. 178. 1991; Kothari in N.P. Singh et al. Fl. Maharashtra St. Dicot. 1:735. 2000. *Ran Shevri.* **(Fabaceae) Plate-I, E.**

Erect, sparingly branched, annual herbs. Leaflets: 20-50 pairs, 0.6-2x0.2-0.3cm, linear–oblong, apex, obtuse. Flower: in lax axillary, 3-6 flowered, 2-3.5cm long, drooping racemes; calyx memberanous, 3-4mm long, glabrous, teeth deltoid; corolla 10-12mm long, glabrous. Pods:

linear, 15-20cm long, beaked. Seeds: 30-40, oblong, Pale yellow. *Exsiccata :* SAS; 9190

Fls. & Frts.: September-November *Locality*: Upper Dudhana

Ammannia baccifera L. Var. **aegyptiaca** (Willld.) Koehne in Engl. Bot. Jahrb.1: 258. 1880. *A. aegyptiaca* Willd. Fl. Enum. Hort. Berol. 1: 6, t. 6. 1803. *A. salicifolia* Hiern in Oliv. Trop. Alfr. 2: 478.1871 exc. Syn. Non Monti ex Bl. 1856; C. B. Cl. in Hook.f. Fl. Brit. India 2: 569. 1879; Cooke, Fl. Pres. Bombay 1: 542. 1958 (Repr.). **(Lythraceae) Plate-I, F.**

Erect herbs; stems and branches more robust, 0.3-0.5 m tall Leaves 1-2 x 0.2 cm, linear-oblong or oblong-lanceolate, base rounded or cordate. Flowers red in dense axillary fascicles. Capsules 0.2-0.3 cm across. *Exsiccata*: SAS; 9160

Fls. &Frts.: October-December *Locality*: Lower Dudhana

Coldenia procumbens L. Sp. Pl. 125. 1753; C.B.cl. in Hook. f. Fl Brit. India 4: 144. 1883; Cooke, Fl. Pres. Bombay 2: 271. 1958 (Repr.); Kazmi in J. ArnoldArbor.51: 148. 1970. '*Tripanki*'. **(Boraginaceae) Plate-I, G.**

Spreading herbs, white hairy. Leaves 1.2-3.5 x 0.6-1.9 cm, ovate-oblong or obovate-oblong, hairy on sides, crisped, apex obtuse, base acute, oblique, margins crenate-dentate. Flowers white, 0.4-0.5 cm wide, subsessile, 4-merous; calyx-lobes ovate; corolla lobes 0.25 cm long, obong, spreading. Drupes 0.3-0.4 cm long, beaked, 4-lobed and breaking into 4-pyrenes. *Exsiccata*: SAS; 9194.

Fls. &Frts.: December-April *Locality*: Dudhana River

Grangea maderaspatana (L.) Poir. in Lam. Encycl. (Suppl. 2.) 825.1812.*Artemisia maderaspatana* L. Sp. Pl. 849.1753;Hook. f. Fl. Brit. India 3:247.1881; Shirodkar& Lakshmin. in N.P. Singh *et al.* Fl. Maharashtra St. Dicot. 2: 218. 2001. **(Asteraceae) Plate-I, H.**

Prostrate annual herbs. Stems: many, spreading from the centre, 10-30cm long, pubescent. Leaves: alternate, sessile, pinnatifid, 2-5cm long; lobes opposite or subopposite, the terminal lobe the largest, all corarsely serrate dentate, pubescent. Marginal florets: female, with filiform 2-fid yellow corollas; central bisexual, 4-5-fid, tubular, yellow. Achenes: subterete, 2-3mm long, glandular. *Exsiccata*: SAS; 9198.

Fls. & Frts.: Dec.-March *Locality*: Upper Dudhana

Limnophila indica (L.) Druce in Rep. Bot. Exch. Cl. Brit. Isles 3: 420. 1914; Philcox in Kew Bull. 24: 115. 1970. Hottonia indica L. Syst. Nat. ed. 10. 991. 1759. *Limnophila*

gratioloides R.Br. Prodr. 442. 1810; Hook. F. Fl. Brit. India 4: 271. 1884; Cooke, Fl. Pres. Bombay 2: 362. 1958. (Repr.). **(Scrophullariaceae) Plate-I, I.**

Herbs, aquatic or marshy, 15-20 cm high, rooting at nodes. Leaves on aerial stems, 0.5-1.9 x 0.15-0.3 cm, linear-elliptic or linear-oblong. Flowers pink or pale white violet-blue spots on lobes, solitary, axillary. Capsules 0.3 x 0.2 cm, subglobose. Seeds black. *Exsiccata*: SAS; 9127.

Fls. &Frts.: August-April *Locality*: Dudhuna River

Bacopa monnieri (L.) Penn. in Proc. Acad. Nat. Sci. Philad. 98.94.1946. *Lysimachia Monneiri* L. Cent. PI. 2:9.1756; Lakshmin. & B.D. Sharma Fl. Nashik Dt. 524. 1991; Godbole & Prasad in N.P. Singh *et al.* Fl. Maharashtra St. Dicot. 2:505. 2001. *Bam, Neer Brahmi.* **(Scrophullariaceae) Plate-I, J.**

Prostrate, creeping or procumbent herbs; stemfleshy, glabrous. Leaves: opposite or the upper alternate, sessile, 0.9x0.3cm obovate, glabrous, fleshy. Flowers: on slender 5-15mm long pedicels, bracteoles linear; calyx glabrous, acute. 3-4mm long; corolla blue or pale purple, 7-8mm long; stamens 4, anthers in pairs, bluish. Capsules: ovoid, 5-6mm long, acute, glabrous. *Exsiccata*: SAS; 9120

Fls. & Frts. : Almost throughout the year. *Locality*: Upper Dudhana

Hygrophila schulli (Buch-Ham.)M.R. & S.M. Almieda in J. Bombay Nat. Hist. Soc. 83. (Suppl.) 221. 1986; Cooke, Fl. Pres. Bombay 2: 389. 1958 (Repr.); C.B.Cl. in Hook. F. FL. Brit. India 4: 328. 1884; *H. auriculata* (K. Schum.) Heine in Kew Bull. 16: 172. 1962. *'Kolsunda', 'Talimkhana'*. **(Acanthaceae) Plate-I, K.**

Herbs, 0.5-1.5 M high, erect, stout; branched subquadrangular. Leaves sessile, 5.0-17 x 0.6-3.0 cm, appear whorl with 6 sharp, yellow spine, oblong-lanceolate or oblanceolate, sparsely hispid on both surfaces. Flowers purple-blue in a whorl at each noed. Capsules 0.8 cm long, linear-oblong. *Exsiccata*: SAS; 9167.

Fls. & Frts.: November-June *Locality*: Upper Dudhana

Phylla nodiflora(L.)Greene in Pittonia 4; 46.1899; Sant.In Rec. Bot. Surv. India 16 (1): 211. 1967 (3rd Rev. ed.) *Verbena nodiflora* L. Sp. Pl. 20. 1753. *Lippia nodiflora* (L.) A. Rich. In Michaux, Fl. Bor. Amer. 2: 15. 1803; C.B.Cl.In Hook. F. Fl. Brit. India 4: 563. 1885; Cooke, Fl. Pres. Bombay 2: 499. 1958 (Repr.). *'Gour Mundi', 'Ratoliva'*. **(Verbenaceae) Plate-I, L.**

Herbs, prostrate; stem appressed hairy. Leaves 0.3-2.5 x 0.1 cm, elliptic-obovate, upper half serrate, appressed hairy, base attenuate. Inflorenscence of axillary spike. Flowers 0.3 cm long, whitish-pink. Drupe 0.2 x 1.5 cm, ellipsoid. *Exsiccata*: SAS; 9192

Fls. & Frts.: August-December *Locality*: Upper Dudhana

Alternanthera sessilis (L.) R.Br. rx DC. Cat. Hort. Monsp. 77. 1813; Hook. F. Fl. Brit. India 4: 713. 1885; Townsend in Dassan. & Fosb. Rev. Handb. Fl. Ceylon 1: 49. 1980; Chaudhury & Bhattacharyya in Bull. Bo.t Surv. India 36. 268, t. 1, figs. 1-8.(1994) 1997. Cooke, Fl. Pres. Bombay 2: 584. 1958 (Repr.). **(Amaranthaceae) Plate-I, M.**

Herbs, spreading, rooting at nodes. Leaves 0.5-5.0 x 0.3-1.0 cm, linear. Flowers white. Utricles 0.15 cm long, with thickened margins. Seeds orbicular. *Exsiccata*: SAS; 9171

Fls. & Frts.: Throughout year *Locality*: Upper Dudhana

Persicaria glabra (Willd.)Gomez in Ann. Inst. Segunda Ensef. Habana 2: 278. 1896; Hara in Hara et al. Enum. Fl. Pl. Nepal 3: 176. 1982. *Polygonum glabrum*Willd. Sp. Pl. 2: 447. 1799; Hook f. Fl. Brit. India 5: 34. 1886; Cooke, Fl. Pres. Bombay 3: 5. 1958 (Repr.) 'Sheral'. **(Polygonaceae) Plate-I, N.**

Herbs, semiaqauatic or aquatic, stoloniferous. Leaves 6-23 x 0.7-3.5 cm, lanceolate, finely acuminate at apex, tapering at base, gland-dotted; ocreae conspicuously veined, truncate at mouth. Perianth pink. Nuts 0.3 cm across, ovoid or suborbicular, compressed, biconvex, brown tom black. *Exsiccata*: SAS; 9190

Fls. & Frts.: Throughout year *Locality*: Upper Dudhana

Ceratophyllum demersum L. Sp. Pl. 992.1753.*C. verticellatum* Roxb. Fl. Ind. 3:624.1832; Lakshmin. & B.D. Sharma Fl. Nashik Dt. 442. 1991; Venkanna & Kothari in N. P. Singh*et al.* Fl. Maharashtra St. Dicot. 2:951.2001. **(Ceratophyllaceae) Plate-I, O.**

Submerged, aquatic plants; stems 20-90cm long, forming much branched, tangle of slender branches and leaves. Leaves: whorled, dichotomously divided into filiform segments. Flowers: males with 6-12, narrow 2-fid tepals, stamens 20-30; females with sessile ovary and subulate styles. Fruits: ellipsoid. *Exsiccata*: SAS; 9169

Fls. & Frts.: Oct.- May *Locality*: Dudhana

Plate - I

Fig. A, B, C, D, E, F, G, H, I, J ,K, L, M, N, O, Respectively

Hydrilla verticillata (L.f.) Royle, III Bot. Himal. T. 376. 1839; Hook.f. Fl. Brit. India 5: 659. 1888; Cooke, Fl. Bombay 3: 170. 1958 (Repr.); Hartog in Steenis, Fl. Melaes, 1, %; 385. F. 1. 1957. **(Hydrocharitaceae) Plate-II, P.**

Herbs, slender, submerged, free floating or rooting, 45 cm long; roots fibrous. Leaves 3-8, 0.6-1.5 cm long, long, linear-oblong, apex apiculate, marigin santire or serrulate. Flowers unisexual, white, male flowers minute, shortly pedicelled, solitroey in subsessile; female flowers sessile, solitary in cylindrical, membranous spathes. Fruits smooth. *Exsiccata*: SAS; 9172

Fls. & Frts.: August-February *Locality*: Dudhana River

Ottelia alisnoides (L.) Pers. Syn. Pl. 1: 400. 1805; Hook.f. Fl. Brit. India5: 662. 1888; Cooke, Fl. Pres Bombay 3: 173. 1958 (Repr.); Hartog in Steenis, FL. Males. 1,5: 398, f. 10. 1957; Subr. Aquat. Ang. 61. 1962. **(Hydrocharitaceae) Plate-I, Q.**

Herbs, annual, submerged, flaccid. Leaves of two kinds; submerged leaves shortly petioled, narrow or oblong, tapering to base; floating ones oblong or orbicular, cordate or rounded at base, then narrowed into angled petiole, up to 18 cm in daim., 7-11 nerved. Flowers

white with yellow blotched base. Fruits 2.0-3.5 cm long ellipsoid. Seeds oblong-fusiform. *Exsiccata*: SAS; 9175.

Fls. & Frts.: September-April *Locality*: Back water Shreedhar Jawala

Vallisneria spiralisL. Sp. Pl. 1015. 1753; Hook. f. FL Brit. India 5:660. 1888; Cooke, Fl. Pres. Bombay 3:171. 1958 (Repr.); Subr. Aqua. Ang. 57. 1962. 'Saivala'. **(Hydrocharitaceae) Plate-II, R.**

Herbs, tufted, submerged. Leaves linear, ribbon-shaped, sheathing at abse, apex obtuse, margins faintly dentate or entire. Flowers diocious, on long or short scapes; male spathes shortly peduncles, included in spathes. Seeds numerous, oblong to fusiform, embedded in a gelatinous mass. *Exsiccata*: SAS; 9199

Fls. &Frts.: Octomber-April *Locality*: Dudhana River

Typha angustifoliaL. Sp. Pl. 971.1753; Backer in Steenis, FL. Males.1, 4: 243, f. 1.1951; *T. angustata* Bory & Chaub. Exped. Sci. Moree Bot. 2, 1: 338. 1832; Hook f. Fl. Brit. India 6: 489. 1893; Cooke, Fl. Pres. Bombay 3: 326. 1958 (Repr.). 'Pan-kanis'. **(Typhaceae) Plate-II, S.**

Herba, 1-2 m high, robust, tufted, perennial. Leaves 1.5-2.0 x 0.5-2.5 cm, linear, thick, subcylindrical above the sheath. Male and female spikes separated by a considerable interval which is up to 30.0 x 0.6-2.3 cm brown. Male flowers slender and paler than the female ones which are mixed with clavate sterile pistillodes. Nutlets small. *Exsiccata*: SAS; 9197

Fls. &Frts.: March-October *Locality*: Dudhana River

Aponogeton natans (L.)Engl. &Kranse in Engl. Pflanzenr. 24: 11. 1906; Subr. Aquat. Ang. 92. T. 5. 1962; Van Bruggen in Blemea 18: 477, f. 2. (11) map 1. 1970. Saururusnatans L. Mant. 227. 1771; Aponogeton monostacyon L. f. Suppl. 214. 1781; Hook.f. Fl. Brit. India 6: 564. 1893; Cooke, Fl. Pres. Bombay 3: 348. 1958 (Repr.). **(Aponogetonaceae) Plate-II, T.**

Herbs, aquatic, submerged; tubers 1.5-2.0 cm across or elongate up to 3 x 2 cm. Submerged leaves lanceolate or oblong, 3-6 x 0.4-1.5 cm; floating leaves linear-oblong, 8-12 x 1.8-3.0 cm. Spathes 1.5 cm long. Spikes 3-8 x 0.4-0.5 cm. Flowers blue, bluish-violet, lilac or rosy pink. Follicles 3, subglobose, 0.4 x 0.3 cm. Seeds oblong, ribbed. *Exsiccata*: SAS; 9152

Fls. &Frts.: July-October *Locality*: Dudhana

Potamogeton perfoliatus L. Sp. Pl. 126.1753; Hook.f. Fl. Brit. India 6: 566. 1893; Cooke, Fl. Pres. Bombay 3: 349. 1958 (Repr.); Subr. Aquat. Ang. 95. 1962; Aziz &Jafri in Nasir& Ali, Fl. W. Pak. 79: 5, 1, G-K. 1975. **(Potamogetonaceae) Plate-II, U.**

Herbs; stems terete, dichotomously branched. Leaves 2.5-6.2 x 1.0-2.5 cm, sessile, obtuse, membranous; stipules small, caduceus. Peduncles short. Spikes 0.63-2.25 cm long. Drupelets 0.2-0.35 x 0.15-0.2 cm, obliquely ovoid, slightly compressed, with a short usually curved beak. *Exsiccata*: SAS; 9182

Fls. & Frts.: February-April *Locality*: Dudhana Lower

Cyperus corymbosus Rottb. Descr. Ic. 42, t. 7, 4. 1773. Lakshmin. & B.D. Sharma Fl. Nashik Dt. 499. 1991; Lakshmin. in Sharma *et al.* Fl. Maharashtra St. Monocot. 280. 1996. **(Cyperaceae) Plate-II, V.**

Perennial, 50–100 cm tall robust rhizomatous herbs. Leaves: linear, blades reduced or very short laminate, 5 – 10 cm long, sheaths glabrous. Flowers: in compound umbels, involucral bracts 3 – 4, often spreading as long as or shorter than the umbels. Nuts: obovoid, apiculate, trigonous ellipsoid, 1.2 x 0.4 mm, often flat, muticous. *Exsiccata*: SAS; 9140

Fls.& Frts. : July – Sept. *Locality*: Upper Dudhana

Cyperus rotundus L. Sp. Pl. 45. 1753. ssp. **rotundus** C. B. Cl. in Hook. f. Fl. Brit. India 6: 614. 1893; Lakshmin & B.D. Sharma Fl. Nasik Dt. 502. 1991; Lakshmin in Sharma *et al.* Fl. Maharashtra St. Monocot. 293. 1996. **(Cyperaceae) Plate-II, W.**

Stout herbs, leaves 10–18 cm long, narrowly linear. Flowers: in compound umbels. Spikelets: 0.8 – 1 x 0.1 cm, linear, brown. Nuts: 0.15 cm long, broadly obovoid, greenish black. *Exsiccata*: SAS; 9142

Fls.& Frts. : July – Sept. *Locality*: Upper Dudhana

Coix aquatic Roxb. Fl. Ind. 3: 571. 1832; Hook.f. Fl. Brit. India 7: 100. 1896; Bor, Grass. Ind. 264. 1960. **(Poaceae) Plate-II, X.**

Annuals or perinnials, 60-150 cm tall.Leabves 20-60 x 1.5-2.5 cm, linear lanceolate, ensiform, long acuminate; ligule membranous. Spikes terminal. Flowers many, 3-6 cm long. Male spikelets 0.8 x 0.6 cm ovate-lanceolate or broadly ovate, arranged in 6 longitidinal rows; female spikelets solitary at base of male spike. *Exsiccata*: SAS; 9178

Fls. &Frts.: October-February *Locality*: Dudhana River

Oryza rufipogon Griff. Notul. 3: 5. 1851. Lakshmin in Sharma *et al.* Fl. Maharashtra St. Monocot. 545. 1996, *Jangli Bhat.* **(Poaceae) Plate-II, Y.**

Herbs. Leaves: 15-30x0.8-1cm, linear, fat, scabridly hairy. Panicles effuse. Spikelets: scabrid, pale green, 7-8mm long; awns scabrid, pale brown. *Exsiccata*: SAS; 9146

Fls. & Frts.: Sept.–Oct. *Locality*: Upper Dudhana

Plate - II

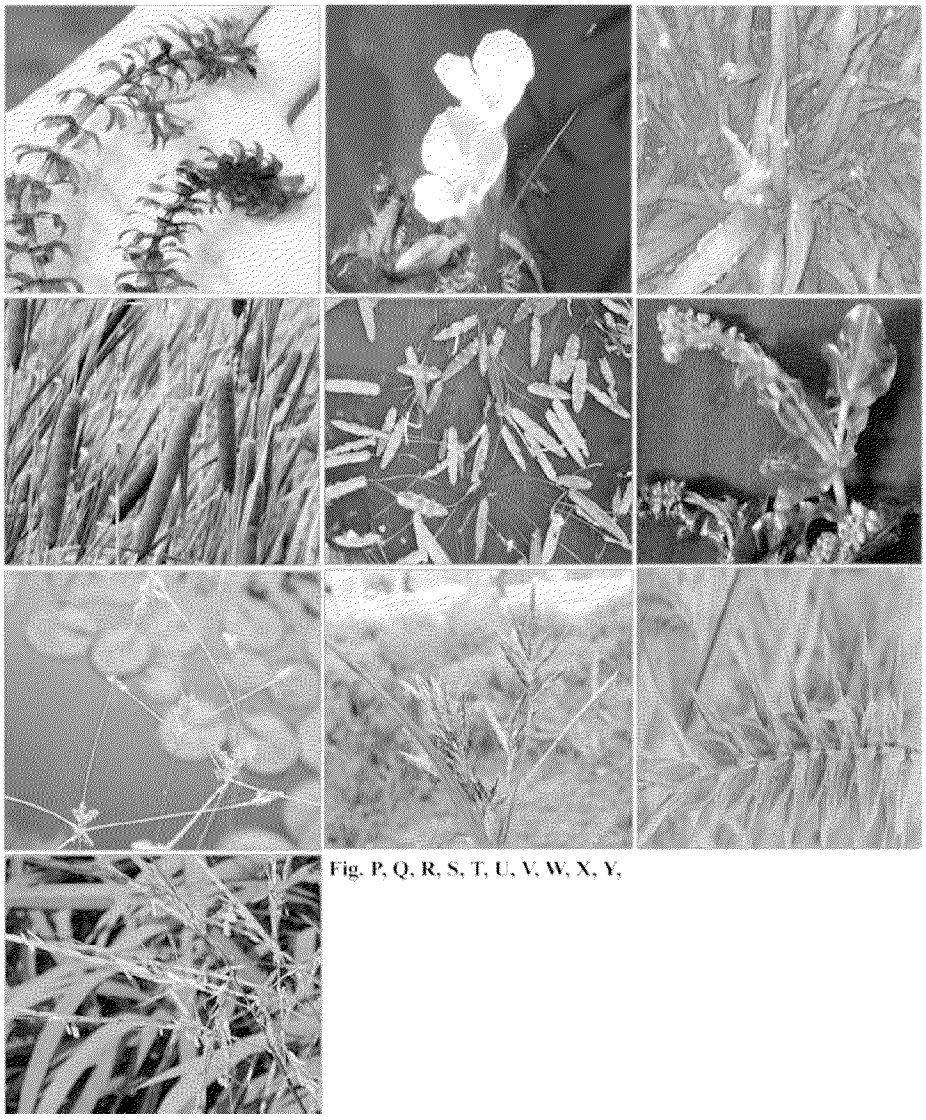

Fig. P, Q, R, S, T, U, V, W, X, Y,

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11. Some Common Botanicals Sold by Vendors in North Maharashtra (India) Combating Human Diseases

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Abstract

The present paper deals with botanical sold by the vendors in Dhule, Nandurbar, Jalgaon, and Nasik Districts of North Maharashtra (India) ethnobotanical survey was carried out few years and information was obtained through open discssions and interviews with tradipracititioners. Presently, 26 plant species belonging to 26 genera and 21 families are communicated and one is gymnospermic.Of these,06 species are noted for first time from Indian region, as where 05 species although recorded so useful, but their parts are different These are administered in different forms of recipes e.g.- paste, powder, extract, ash, decoction etc. Even they are used raw or sometimes simply warmed. In many cases, they use them as a sole drug or occasionally supplemented by other botanicals or domestic substances like sugar, cow ghee, honey etc. These are used to combat about 26human disease such as kidney stone, bile, jaundice, asthma, impotency, dropsy, diarrhoea, redness of eyes, skin, leprosy, piles, malaria, constipation, rheumatism, eczema, urinary, goiter, tonsillitis, scabis, leucodarma, epilepsy, night blindness, heart, ulcer, liver, cancer etc. The data accrued is assessed by cross-cultural comparisons with other Indian clams to bring out their veracity and uniqueness of the claims. The objective of investigation was to gather and document information on utilization of botanicals by the tradipractitioners in the region. They must be testified on scientific line involving chemical, biological and clinical screening.

Key Words : Ethnomedicine, Herbal Vendors, North Maharashtra.

Introduction

Medicinal plants have been crucial in sustaining the health and well-being of mankind. It is generally agreed that major section of population especially in developing and underdeveloped countries seek healthcare from sources other than conventional medicines. They also seek help of some organized systems of medicine like Ayurveda, Unani, Siddha, etc. Apart from these, every community or village has a wealth of herbal folklore. Our ancestors possessed a profound understanding of healing powers of plants. They used to try and test local plants for a range of common health problems. These ancient healing practices are still in vogue in a period when different well-thought and organized systems of medicine are being practiced all over the world. Their knowledge has been passed orally generation-to-generation since long past. India is one such country having the oldest system of healing in the world. Moreover, tribal and rural societies in India still have their own choices of indigenous drug selection and application. A review of literature indicates the Herbal Vendors (Jadibutiwalas) and their traditional knowledge about plant drugs has remained untapped. They have been always ignored in our country. In India, Sinha (1998) attempted on this line and studied Delhi and surrounding areas. The present authors investigated some districts of north-western part of Maharashtra. *viz.* Dhule, Nandurbar, Nashik, Jalgaon. Information of 26 plants species. used for human disease being communicated in this paper.

Methodology

Herbal vendors wandering in north Maharashtra are tapped and enquiries *w.r.t.* plant drug, recipe, administration, plant names, precautionary tips and diseases treated are noted. Plants samples or products are purchased / collected and preserved scientifically. They are identified by using various regional, state and national floras in India. (Cooke, 1958; Hooker 1853; Naik, 1998; Sharma *et al.*, 1996 Singh *et al,* 2000; Patil 2003, and Kshirsagar and Patil 2008) Repeated surveys were conducted in different villages, towns and cities of North Maharashtra. Information regarding remedies related especially to the human diseases was recorded. The data adduced is based on personal interviews, observations and experiences of vendors in the region. The data is compared with the classical literature to point out new reports from India (Anonymous 1948-1976; Ambasta 1986; Jain 1991; Watt 1889-1893; Bhattacharjee, 1998 etc.) Asterisk to the plant species indicate reports in classical literature. These are presented in the following Table-I.

Table – I : Enumaration of identified botanical and utilities

Sr. No.	Plant Name & Family	Vernacular Name	Plant Part Used	Utility
1	**Limonia acidissima L. (Rutaeae)**	Kauth	Leaves , Fruit	1.One kg. of leaves are dried and made into powder three teaspoon of this powder twice a day is advised for one month to treat diabetes and kidney stone. 2.Fruit pulp mixed with 50 gm of jagerry (*Saccharum Officinarum* L.) is added into fruit pulp and advised tea spoon twice a day for seven days in the treatment of bile problem. 3.One tea spoon of leaf juice is advised with cupful of milk twice daily for four days to cure jaundice.
2	**Linum usitatissimum L.** **(Linaceae)**	Javas	Seeds	1.Five grams of seeds are soaked in cupful of water for 12 hrs. and the infusion is consumed advised twice daily to the person suffering from asthma. 2.Seeds of this plant, few seeds of (*Piper nigrum* L.) and spoonful of honey are mixed thoroughly and one teaspoon of this mixture is advised twice daily for fifteen days increase sexual vigour, it also improves sperm count.
3	**Luffa acutangula (L.) Roxb. Var. amara (Roxb.) Clarke. (Cucurbitaceae)**	Dodake	Leaves , Fruits	1.Leaves juice in early morning two to three drops are dropped into the nose for eight days to cure jaundice. 2.Tender fruits are cooked in curry form and consumed orally for one month useful against impotency.

4	**Momordica diocea Roxb. Ex. Willd. (Curcurbitaceae)**	Katorle	Leaves	1.Leaf juice is mixed with honey and two teaspoons of mixture is given orally for one month twice a day to person suffering from dropsy. 2.Few drops of leaves juice dropped nostrils get relief from head ache.
5**	**Morus alba L. (Moraceae)**	Tuti	Leaves, Fruits	1.Leaves powder one teaspoonful twice daily with water for seven days improve digestive system, it is also acts as appetizer. 2.Ripe fruits and roots are boiled together and decoction one teaspoonful is given orally twice a day for two days to control diarrhoea.
6*	**Mussaenda glabra Vahl. (Rubiaceae)**	Musanda	Leaves	1.Fresh leaves are crushed and paste is applied around eyes to cure redness of eyes. 2.Fresh leaves juice about 10-15 ml. is consumed twice for three days against intestinal worms. 3.Leaves are crushed and applied on skin to cure intching of the skin.
7**	**Nerium indicum Mill. (Apocynaceae)**	Kanher	Leaves	1.Roots of this plant, roots of (*Plumbago zeylanica* L.) are mixed in oil of (*Sesamum oriantalae* L.) and this paste is applied on white spots of leprosy for one month at nighttill it cure. 2.Flowers and roots are curshed. The paste is prepared in cow's urine, it is applied to get relief from injuries of piles.
8*	**Operculina turpethum (L.) silva Manoso. (Convolvulaceae)**	Nishotter	Leaves	1.Dried leaves powder abut 10 gm. is consumed with honey daily at night for fifteen days to cure malaria. 2.Dried leaves powder about 2-3 gm. is consumed with water at night for ten days helps against constipation.
9**	**Ougenia oojeinensis (Roxb.) Hochr.**	Timas	Stem bark	1.Stem bark decoction is used to take bath, also the stem bark paste is

	(Fabaceae)			applied on skin to cuer skin problems due to leprosy. 2.Decoction of stem bark about 5-10 ml. is consumed daily at night for five days to cure fever.
10	**Papaver rhoeas L. (Papaveraceae)**	Lal-beheman	Stem bark, Latex	1.Stem bark powder mixed in warm oil of (*Cocus nucifera* L.) is applied on joints to get relief from rheumatism. 2.The latex collected from incision of unripen capsule wall is source of opium. The latex is applied on legs for three nights to cure eczema.
11**	**Phaseolus rotundus L. (Fabaceae)**	Ran-mug	Root, Stem bark	1.Two fistful of roots are crushed fine and put in three glasses of water one glass infusion is drunk in the morning, noon and night for week to cure diarrhoea. 2.One plant twig is crushed and put in one glass of water for fifteen minutes and strained one teaspoonful of infusion is advised in the morning and evening for four days to cure jaundice.
12*	**Phyllanthus amarus Schumach and Thonn. (Euphorbiaceae)**	Bhui Awala	Leaves	1.Two teaspoon powder of dried leaves twice daily for seven days is treated to control fever and jaundice. 2.Leaves of this plant, fruits of (*Piper nigrum* L.) and (*Myristica fragrans* Houtt.) crushed and mixed thoroughly. Pellates are propared and one pellate twice a day for four days cures Malaria.
13	**Picrorhiza kurroa Royal ex. Benth. (Scrophulariaceae)**	Kutaki	Stem bark, Rhizo me	1.Decotion of this plant, Stem bark of (*Swertia ciliata* Buch-Ham) and roots of (*Ricinus communis* L.) are mixed throughly two teaspoon twice for three days in the treatment of pneumonia. 2.Dried rhizome powder is given orally after lunch for three days to get relief from stomachache.

14*	**Piper retrofractum Vahl. (Piperaceae)**	Chavak	Root, Fruit	1.Decoction of root about 10-15 ml. is consumed twice a day for four days in throat infection. It is also helpful against asthama and to reduce swelling of lungs. 2.Fruit powder about 1-2 gm. is mixed with equal amount seeds of (*Mangifera indica* L.) and this powder is consumed one teaspoon twice a day with water to cure diarrhoea.
15	**Pithecelobium dulce *(Roxb.) Bth* (Mimosaceae)**	Vilayti chinch	Leaves , Root	1.Root extrract about a cup is consumed with spoonful of cow ghee twice a day for three days to treat worms and inflammation in urinary tract. 2.Root extract is prepared in water. About one glass of it is drunk for three to four days at morning to cure piles. 3.Leaf juice about two to three drops is dropped into ear to cure ear inection and pus formation.
16	**Plumbago indica L. (Plumbaginaceae)**	Raktachitra	Roots, Stem bark	1.Roots of this plants and coconut oil (*Cocos nucifera* L.) are mixed and the paste is applied on goiter for three days at night till it cures. 2.Stem bark are dried is mixed in cow's milk and the paste is applied on skin for three days at night to cure white spots on skin. 3.Stem bark paste is mixed in cow's milk and the paste is applied on skin at night for two days to cure bile.
17	**Plumeria rubra L. (Apocynaceae)**	Lal Champa	Stem bark, Root	1.One teaspoon dried stem bark powder twice a day for three to five days is to treat malaria. 2.Stem bark powder is given orally in morning and evening for seven days to get relief from tonsillitis. 3.Dried roots powder is advised for

				four nights with milk against painful menstruation.
18	**Psoralea carylifolia L. (Fabaceae)**	Bawanchi	Leaves , Seeds	1.The leaves are dried in the shade for one day and fine powder is prepared it is applied on skin to cure scabies. 2.Leaves and stem are boiled with black tea (*Camellia sinensis* (L.) Kuntze.) one cup of decoction after cooling is advised in the morning to treat cough and asthma. 3.Seed oil is extracted and applied against leucoderma till cures.
19	**Quisqualis indica L. (Combretaceae)**	Madhumalti	Seeds	1.Roasted seeds 2-4 are consumed twice a dya for three days to cure diarrhoea. 2.Seed powder about 1-2 gm. is consumed with honey or water for seven days twice a day to kill intestinal worms.
20	**Semecarpus anacardium L. f. (Anacardiaceae)**	Biba	Leaves , Seeds	1.Seed paste is applied on joints at night for fifteen days to get relief from rheumatism. 2.Leaves are dried and powdered. It is used to massage gums and teeth against toothache and oral complaints. 3.Seeds are burnt and ash is mixed in coconut oil (*Cocus nucifera* L.) It is applied on affected skin to cure eczema.
21**	**Sesbania grandiflora Poir (Fabaceae)**	Haataga	Leaves , Flowers	1.Dried leaves powder of this plant and seed powder of (*Piper nigrum* L.) are mixed in cow's urine is advised to mell to the person suffering from epilepsy. 2.Flowers of the plant are cooked and

				eating twice daily for seven days to cure night blindness.
22	**Setaria glauca (L.) Beauv. (Poaceae)**	Gavati kavali	Flowers, Leaves	1.Inflorescences are collected and crushed in milk it is boiled and filtered one spoonful of this filtrate is given to children to treat tape worms. 2.Leaves are boiled in black tea(*Camellia sinensis* (L.) Kuntze.) and cupful decoction in the morning for a week to relives rheumatism.
23*	**Sida cordifolia L. (Malvaceae)**	Mahabala	Fruits, Roots	1.Fruits and flowers are crushed together a pinch of salt is added and is consumed twice a day for seven days to cure urinary infection. 2.Decoction of roots about 10-15 ml. is consumed daily at night for fourty-five days to cure leucorrhoea. 3.Root powder is consumed with teaspoonful of sugar (*Saccharum officinarum* L.) relieves painful micturition.
24	**Sphaeranthus indicus L.(Asteraceae)**	Muli	Flowers	1.Decoction of flowers about 15 ml. is consumed daily at night for fourty-five days and then slowly increase the dose 1-1 ml. up to 30 ml regularly cures heart problems. 2.Dried flower powder 1-2 gm. is consumed with water to reduce body odour.
25	**Strychnos potatorum L. (Longaniaceae)**	Nirmali	Leaves, Seeds	1.Seed powder one teaspoon with water in the morning for fourteen days is aphrodisiac. 2.Half cup of dried leaves powder given orally in water for seven days in morning and evening to cure ulcers.

26*	**Taxus baccata L. (Taxaceae)**	Birmi	Leaves	1.Decotion of leaves of this plant is consumed twice a day for one month to treat liver complaints. 2.Decoction of entire plant is used to consumed at night regularly is helpful against cancer and cancer related problems.

Result and Discussion

Our investigation on botanicals sold by the herbal vendors in Nashik, Dhule, Nandurbar, Jalgaon districts of North Maharashtra revealed 26 plant species useful to cure patients suffering fromkidney stone, bile, jaundice, asthma, impotency, dropsy, diarrhoea, redness of eyes, skin, leprosy, piles, malaria, constipation, rheumatism, eczema, urinary, goiter, tonsillitis, scabis, leucodarma, epilepsy, night blindness, heart, ulcer, liver, cancer. These belong to 26 genera and 20 families of angiosperms and one Taxus baccata is gymnospermic. of these 06 speciesare exotic. These are advised to employ botanical in the form of various medicinal recipes e.g. powder, Extract, juice, ash, oil, decoction, paste. The number in parenthesis indicates of use-reports for the respective parts. These are supplemented also in few cases by sugar and butter milk, cow urine. There are 11 species, which on comparison with classed literature, are being report useful for the first time from India. There are 05 species viz, Morus alba, Nerium indicum, Ougenia oojeinensis, Phaseolus rotundus, Sesbania grandiflorawhich are reported earlier useful for the affliction under study but the parts use employed are different. The herbal vendors carry on their business traditionally especially in publics places like, railway stations, bus-stations, weekly bazaar, famous temples, pilgrims, special gatherings, courts, government, offices, main roads, etc. Even in modern period, many people purchase medicines from them. It is not scientifically verified by the vendors and hence it is advisable to testify these bioresources in laboratories. Such attempts will authenticate these claims and may add new or additional source of medicines

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12. Species Diversity of Heterocystous Genus Calothrix Ag. from Soils of North Maharashtra Region, India

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Abstract

Blue green algae can distribute themselves widely on diverse habitats. They contribute to soil micro flora and establish themselves as a major component of it. It is important to explore native soil flora of Blue green algae of particular region. Extensive survey was made to study naturally growing soil algae of North Maharashtra. Among Blue greens, heterocystous forms are known for their potential ability to increase nitrogen content in soil and thus hold considerable environmental importance. Fifteen Soil growing taxa of heterocystous genus *Calothrix* Ag. has been taxonomically studied from North Maharashtra region.

Key words: Heterocystous Blue Green algae, Soil algae, *Calothrix* Ag.

Introduction

Calothrix Ag.is a heterocystous Blue green algae. It is having filament with mucilage sheath. Trichome gradually tapers at one end and drawn into hair giving whip like appearance. Heterocyst is basal, generally single or rarely in pairs, seldom intercalary. Distribution and species diversity of genus *Calothrix* Ag.is enumerated here is a part of floristic study of soil algae from North Maharashtra region.

Material and Method

North Maharashtra region comprises three Districts Dhule,Nandurbar and Jalgaon. Naturally occurring, surface growing algal crust were collected in rainy season from various habitats like open barren lands, paddy fields, cultivated soils, grass covered soils and all possible moist soils showing algal growths. Microscopic observations, line drawings were made for

taxonomical study. Identification were done with the help of standard monograph of Desikachary 1959 and relevant literature.

Observations

1.*Calothrix bharadwajae* De Toni, J

Filament slightly bent, sheath very distinct, thin hyaline, closely depressed to constricted trichome,cells of trichome barrel shaped 3-6µ broad, tapering to hair, heterocyst intercalary and basal, 4.5-5.25µ broad,5.25-6µ long, intercalary adjoining to spore, spore cylindrical,7.5-9.75µ broad,upto 18.75µ long, with smooth wall.

Habitat: On moist soils in rainy season, Dhule.

2.*Calothrix braunii* (A.Br.) Born.et.Flah.

Filament straight 8.25-9µ broad, swollen at base, slightly bent, sheath thin, close to trichome,colourless,trichome 4.5-6µ broad taper at apex up to 3µ,constricted at cross wall, cells shorter than broad, at hair region longer,heterocyst basal,hemispherical,7.5µ broad,4.5µ long.

Habitat:On wet mud,Dhule

3.*Calothrix brevissima* West G.H. f. ***constricta*** f.nov .

Filament epiphytic on other algae,52.5-57µ long, very short 9-12µ broad, very little attenuated, sheath firm,trichome broad at base, little attenuated, with rounded end cells, constricted at cross walls, olive green, cells broader than long,6-7.5µ broad,4.5µ long, heterocyst basal single, hemispherical 6-7.5µ broad,4.5µ long, sheath has contours following cell constriction of trichome.

Present alga differs than the type described by Desikachary 1959 in having contours on sheath and trichome cells are broader, constricted.

Habitat: On grass covered soil, epiphytic on *Lyngbya*,Dhule.

4. *Calothrix castelli* (Massat) Born.et.Flah.f.***minor*** f.nov.

Filament slightly curved up to 9µ broad, swollen at base, tapers at apex, sheath thin close to trichome, firm, uniform, hyaline ,trichome 7.5µ broad at base,3.5µ broad and tapered at apex, hair is not so long, heterocyst basal, in pair, 6µ broad,4.5µ long.

Present alga shows narrower filament and trichome which produced into short hair than the type described by Desikachari 1959.

Habitat: Paddy field environment,Pimpalner.

5. *Calothrix castelli* (Massat) Born.et.Flah. Var.***somastipurense*** Rao C.S.

Filament closely interwoven,12-15µ broad, sheath colourless up to 2.25µ thick,trichome swollen at base, slightly constricted at septa,12µ broad at base, taper into hair, at apex 2.25µ broad, cells 4.5-7.5µ long, heterocyst basal single,hemispherical,7.5-10.5µbroad,4.5-6µ long.

Habitat: Moist soils, Dhule,Nandurbar.

6. *Calothrix clavatoides* Ghose

Trichome single curved at apices straight at base,10.5µ broad at base, sheath thin colourless, cells at the base discoid, middle cells longer,3.75-4.5µ broad, heterocyst basal, single globose 9-12µ broad,9-10.5µ long.

Habitat: On soils of Jalgaon,Dhule.

7. *Calothrix fusca* (Kuetz.) Born.et.Flah.(f.Rao)

Filaments up to 11.25-13.5µ broad tapered up to 3.75µ,sheath 3-3.75µ thick, trichome 7.5µ broad at base, tapers at apex, cells broader than long, heterocyst 7.5µ broad,6µ long, basal hemispherical.

Habitat:Dhule.

8. *Calothrix gardneri* J.DeToni

Filaments up to 10.5µ, broad at base, at top 4.5µ broad,trichome 6-7.5µ broad, tapers up to 3µ at apex, cells 3-6µ long, heterocyst 5.25µ broad,4.5µ long,basal,hemispherical.Filament not completely straight, but bent at apex and slightly narrow.

Habitat: On grass covered soils, Jalgaon.Irrigated cultivated soils,Dhule.

9.*Calothrix marchica* Lemm.Var.***crassa*** Rao C.B.

Filament in groups, irregularly bent,7.5-9µ broad, sheath firm, yellowish at maturity, trichomes 6-7.5µ broad, constricted, ends tapering without a hair, end cell conical with rounded apex, the cell at apices 4.5µ broad and 4.5µ long, heterocyst single, basal sub spherical,7.5µ broad,6µ long. Present alga has narrower filament and trichome.

Habitat:On moist soils of grass covered grounds, on moist soils near house drains, crop field soil,Dhule Nandurbar ,Jalgaon.

10. *Calothrix marchica* Lemm.Var.***intermedia*** Rao C.B.

Filament epiphytic on other algae,5.25-6.75µ broad, with slight attenuation, without terminal hair, sheath hyaline,trichome 4.5-6µ broad, constricted at cross walls, cells quadratic or

slightly shorter or longer,3-6µ long, end cell rounded, heterocyst single,basal,4.5-6µ broad. Present alga slightly smaller in dimensions.

Habitat: Epiphytic on other algal filament, on soils of paddy fields,Pimpalner.

11. ***Calothrix marchica*** Lemm.Var.***intermedia*** Rao C.B.f.***minor*** f.nov.

Filament associated along with mucilage of other algae, in groups of two or three,5.25-6µ broad, with slight attenuation, slightly bent, without terminal hair, sheath thin firm hyaline, trichomes 3.75-4.5µ broad, constricted at cross walls, quadratic or slightly longer or shorter, end cell rounded, heterocyst single,basal,spherical,4.5µ broad.

Present alga has narrow filament and trichome, small heterocyst than type var.*intermedia* (Desikachary 1959) also sheath is not uniform but showing contours at constriction.

Habitat:Paddy fields,Sakri,Navapur.

12.*Calothrix membranacea* Schmidle

Filament long curved, up to 7.5µ broad at base, attenuated gradually, sheath thin, hyaline not lamellate, trichome seldom produced into hair, cells half as long as broad or sub quadrate at apex, hair hyaline and elongate, trichome 4.5-6µ broad, hormogone with few cells, heterocyst basal,4.5-5.25µ broad,4.5µ long.

Habitat: On cultivated soils, Jalgaon.

13. ***Calothrix stellaris*** Born.et.Flah.

Filament single, unbranched, bent at hair region, up to 12-15µ broad at base and attenuated at apex in thin hair, sheath lamellate, cells 6µ broad, slightly constricted 3-4.5µ long heterocyst single basal, hemispherical 7.5-8.25µ broad, up to 4.5-6µ long.

Habitat: On marshy soils, Dhule.

14. ***Calothrix weberi*** Schmidle

Filament single, bent, about 7.5µ broad at base, ending into hair, up to 3µ broad, sheath close to trichome, diffluent, hyaline thin, trichome 6µ broad, cells cylindrical, little longer than broad,6-7.5µ long, blue green, heterocyst basal, 3-3.75µ broad, 4.5-5.25µ long.

Habitat:Paddy field soils ,Pimpalner.

15. ***Calothrix wembaerensis*** Hieron.et Schmidle

Filament branched, sheath thick, gelatinous, cells at base of filament 7.5-8.25µ broad,4.5-5.25µ long, heterocyst basal, single or two 6µ broad and 4.5-6µ long, spore in young stage 6-6.75µ broad,15-18µ long, separated by one pored heterocyst.

Habitat:Paddy field soil ,Sakri.

Result and Discussion

Diversity of *Calothrix* Ag. is enumerated here was found growing naturally on soil surfaces . It was collected from various environments. Fifteen soil growing species were reported from North Maharashtra, out of which, three were new and firstly reported morphoforms inhabiting on soil.

Calothrix brevissima West G.H. f. ***constricta*** f.nov .

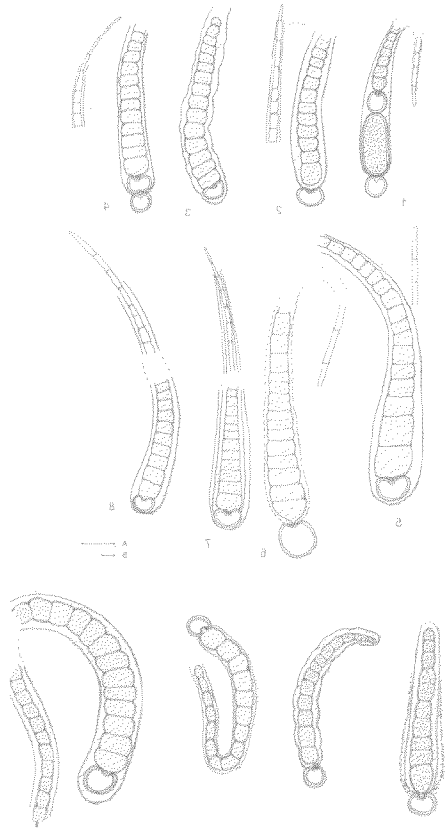
Calothrix castelli (Massat) Born.et.Flah.f.***minor*** f.nov.

Calothrix marchica Lemm.Var.***intermedia*** Rao C.B.f.***minor*** f.nov.

Taxa show morphological variations in their dimensions as well as in characters like, sheath, cell size of trichome and heterocyst.

Acknowledgement

Author wish sincere gratitude to P.G.Department of Botany, S.S.V.P.S.L.K.Dr.P.R.Ghogrey Science College, Dhule, for providing necessary facilities.



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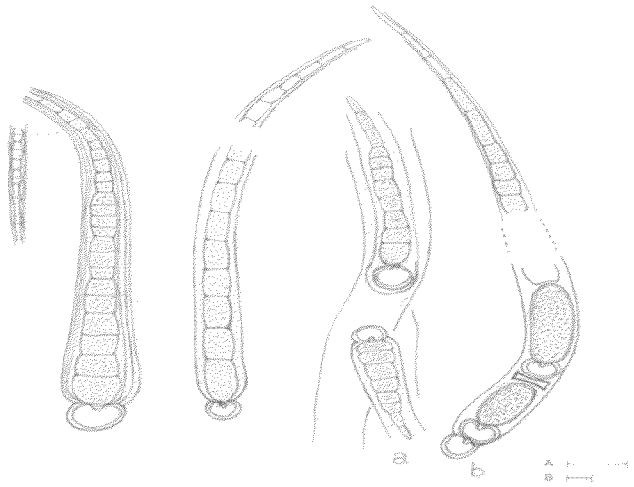

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13. Spectroscopic and Chromatographic Study on Ischaemum Pilosum (Klein.Ex Willd.)

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Abstract

Ischaemum pilosum (Klein.ex Willd.) Wt belonging to the Poaceae Family locally known as Kunda commonly distributed in crop as a weed. Many medicinal uses has been reported in literature for this plant with many folk information. The current work deals for finding actual acts and facts ingredients in plant with phytochemical technique and validations. Preliminary phytochemical test for secondary metabolites has been done with standard protocols followed proximate, UV, FTIR and GC-MS investigations on leaf of Ischaemum pilosum. The results revels very positive significance data from all phytochemical analysis and found various phytochemicals are detected in GC-MS peaks, which farther gives structure by library matched and found..viz,,,

Key Words:, Ethnobotany, Phytochmistery, Fourier Transform Infrared Spectrophotometer (FTIR) and Secondary Metabolites

Introduction

Ischaemum pilosum belonging to the family Poaceae, *locally name as Kunda, Kons and Khavon. It is a typical type of* Perennial creeping grass with the stolons that covers shoots at the base with dry striate leaf sheaths. Stems 60-90 cm stout. Leaves long, narrow, convolute; ligules membranous. Spike 2-6 on the stout peduncle. Spikelets wooly white and troublesome weed on black cotton soil.

Ischaemum pilosum Klein ex Willd were chosen as sources of lignocellulosic material for the preparation of ethanol (Soe Soe Than 2016). A decoction of root powder is given against urine stone twice in a day for seven days. A teaspoon of root powder is given to cow, twice in a day for 5 days to flow milk (Rothe *et.al.,* 2017)

Materials and Methods

The present investigation i.e., pharmacognostical, Phytochemical and sedative activity of leaves of ***Ischaemum pilosum*** is proposed since no such comprehensive work is available specially for Phytochemical work .

Field Work: ***Ischaemum pilosum*** (Klein.ex Willd.) Wt plant were collected from the forests of Toranmal of Shahda Tahsil of Nandurbar Disterct. With collection ethonobotanical importances also been recoreded from local tribal peoples laeeter cross the collected information data with exixting literature of ethnomedicn. Plant sample were collected for lab work and also recoreded the geographical location of plant for reviste in feutre.

Laboratory work

Taxonomical identification was done with the help different flora like Flora of Presidency of Bombay, **Flora of Dhule and Nandurbar District and recorded taxonomical characters.**

Proximate Analysis: It was taken for identification for moisture, Dry matter and Ash content.

Moisture content: The moisture of the sample was lost by volatilization caused by heat. Moisture of the material was determined by following the method by AOAC (Association of Official Analytical Chemists) 1990. Dishes were washed with detergents and then were dried at 105 0 C in oven for overnight. Then dishes were removed from oven and then kept in dessicator for cooling and weights. The estimation was done in triplicate and the mean values of both were recorded to calculate the moisture content using the following relationship. 2 gm sample was taken in dishes and placed in oven at 105 0 C overnight. The moisture was calculated by using the following formulae:-

$$\text{Moisture content (\%)} = \frac{(\text{Weight of fresh sample} - \text{Weight of dry sample})}{\text{Weight of fresh sample}} \text{x } 100$$

Dry matter Content: The dry matter of the sample represents the amount of material left after the complete removal of moisture from it. Dry matter of the sample were determined by following the method by AOAC (Association of Official Analytical Chemists) 1990. Dishes were washed with detergents and then were dried at 105 0 C in oven for overnight. Then dishes were removed from oven and then kept in dessicator for cooling and weights. The estimation was done in triplicate and the mean values of both were recorded to calculate the dry matter Content.

2 gm sample was taken in dishes and placed in oven at 105 0 C overnight. The moisture was calculated by using the following formulae:-

$$Dry\ matter\ (\%) = \frac{(Weight\ of\ dish\ +\ Weight\ of\ dried\ sample) - Weight\ of\ dish}{Weight\ of\ sample\ before\ drying} x\ 100$$

Ash Content: Ash value was determined by following the method of AOAC (1990). For this crucible were kept in a muffle furnace at 600 0 C for 1h. Then they were transferred crucible from furnace to a desiccator and cooled to room temperature and weighed as quickly as possible to prevent moisture absorption. Two gram dry plant part sample was taken in tared silica crucible and placed in a muffle furnace at 600 0 C for 6h. Then crucible was transferred to a desiccator and cooled to room temperature, crucible was transferred as quickly as possible to avoid moisture absorption. The percentage of ash was calculated by using the following formula:-

$$\text{Ash}\ (\%) = \frac{\text{Weight of Ash}}{\text{Weight of sample}} \text{x}\ 100$$

Phytochemical studies

	Name of the test	*Procedure*	*Observation*	**References**
1	**Alkaloids**	0.5ml extract + treated with few drops of 1ml 2N Hcl +Mayer's reagent / Dragandorf reagent Hager"s reagent	Orange precipitate Orange color White ppt. Yellow ppt.	Vaishali *et al.* 2013
2	**Anthraquinone**	Few drops of extract was boiled with 10% Hcl for few minutes & cool + CHcl3 (Chloroform)to filtrate & few drops of NH3 added and heated	Rose pink color	Yusuf et al. 2014
3	**Cardiac glycosides**	0.5ml extract + 1ml water + aqueous solution NaoH some drops for color	Brown interface, violet ring below and greenish ring at lowest part	Vaishali *et al.* 2013 Kangogo et al. 2014
4	**Coumarins**	2 ml of extract, 3 ml of 10% naoh	Appearance of yellow colour indicates presence of coumarins.	Dharmendra et al. 2012
5	**Flavonoids**	0.5ml extract + 5-10 drops of dilute Hcl + small amount / pieces + then	Red color Magenta color	Krishnaiah et al. 2007

		boiled for few min. Shinodaw"s Test Zn-HCl acid reduction Test		Dharmendra et al. 2012 Yusuf et al. 2014
6	**Glycosides**	Anthrone + H2SO4+ Heat	Purple or green	Dharmendra et al. 2012 Yusuf et al. 2014
7	**Phenols**	Fecl3 Sample + lead acetate + water	Intense color Formation of white ppt	Dharmendra et al. 2012 Yusuf et al. 2014 Kangogo et al. 2014
8	**Reducing sugars**	0.5ml extract was dissolved in 5ml of water and filter it + boiled with Fehling's solution A & B for few min.	Orange red precipitate positively detects reducing sugars.	Yusuf et al. 2014
9	**Saponins**	Sample + water + shaking	Formation of honey comb like froth Presence of froths/foams	Dharmendra et al. 2012 Yusuf et al. 2014 Kangogo et al. 2014
10	**Steroids**	Salkowski's test and Liebermann burchard's test	Dark green color in the upper layer and red color in the lower layer indicating the presence of steroids	Dharmendra et al. 2012 Vaishali *et al.* 2013 Yusuf et al. 2014

11	**Tannin**	0.5ml of aqueous extract + 10% lead acetate few drops	Greenish-black colouration	Vaishali *et al.* 2013 Yusuf et al. 2014 Mohammad et al. 2014
12	**Triterpenes**	Liebermann Test Salkowski Test Noller‟s test	Bluish green Red & fluorescent Pink color OR Reddish-brown coloration of the interface	Vaishali *et al.* 2013 Yusuf et al. 2014 Kangogo et al. 2014

UV Visible Spectral Analysis: Extraction of dry leaves was carried out for 5 g of powder for 24 cycle of soxhlet extract. Three solvent were used for extraction viz. Methanol, Ethanol and Chloroform. Different concentrations and dilutions were made for UV analysis in 300nm to 1000nm range for all three samples in replicate.

Concentration	**Methanol Extract**	**Ethanol Extract**	**Chloroform Extract**
20%	200µl/ml	200µl/ml	200µl/ml
40%	400 µl/ml	400 µl/ml	400 µl/ml
60%	600 µl/ml	600 µl/ml	600 µl/ml
80%	800 µl/ml	800 µl/ml	800 µl/ml
100%	Pure extract	Pure extract	Pure extract

Fourier Transform Infrared Spectrophotometer (FTIR): FTIR is perhaps the most powerful tool for identifying the types of chemical bonds (functional groups) present in compounds. The wavelength of light absorbed is characteristic of the chemical bond as can be seen in the annotated spectrum. By interpreting the infrared absorption spectrum, the chemical bonds in a molecule can be determined. (Yang et al. 2002, Martín et al. 2005 and Duraes et al. 2008). Dried powder of different solvent extracts of each plant materials were used for FTIR analysis. 10 mg of the dried extract powder was encapsulated in 100 mg of KBr pellet, in order to prepare translucent sample discs. The powdered sample of each plant specimen was loaded in

FTIR spectroscope (Shimadzu, IR Affinity 1, Japan), with a Scan range from 400 to 4000 cm 1 with a resolution of 4 cm 1.

Gas Chromatography: Mass Spectroscopy (GCMS)

Gas Chromatography-Mass Spectrometry (Finnigan Matt GCO Mass Spectrometer) is one of the hyphenated analytical techniques. Gas chromatography separates the components of a mixture and mass spectrometry characterizes each of the components individually. By combining the two techniques one can evaluate a solution (both qualitatively and quantitatively) containing a number of chemicals which are used extensively in the medical, pharmacological and law enforcement fields. GC-MS is a hyphenated experimental technique that incorporates two widely used methods in tandem. The GC portion is the Gas chromatography used for separating components in a mixture, and the MS portion is the mass spectrometry used in the qualitative and quantitative analysis of each component that was separated by the Gas Chromatography (GC).

Result and Discussions

Proximate Analysis

	Moisture content	**Dry matter Content**	**Ash Content**
Leaves (w/w)	51.00 %	49.00 %	12.00%
Stem Parts (w/w)	54.00 %	46.50%	14.00%
Root (w/w)	51.50 %	46.50%	15.50%
Total	**52.16%**	**47.33%**	**30.33%**

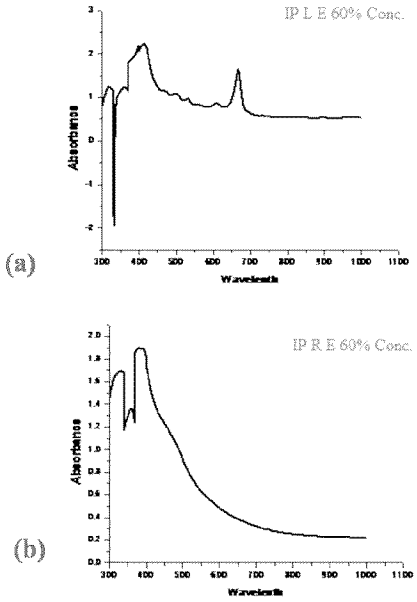
3. Primary Phytochemistry

Ischaemum pilosum (Klein.ex Willd.) Wt

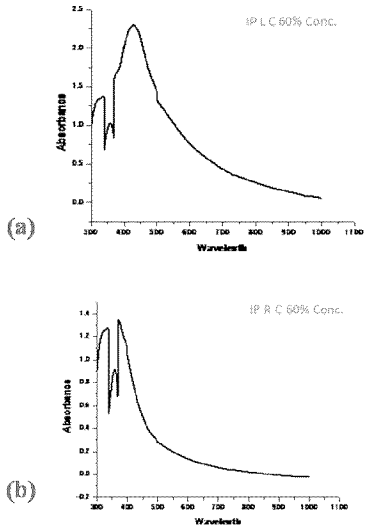
Sr. No.	**Phyto-constituents**	***Ischaemum pilosum* (Willd.) Wight.**											
		SHOOT POWDER						**ROOT POWDER**					
	Solvent System	**Aq**	**M**	**E**	**Et**	**C**	**A**	**Aq**	**M**	**E**	**Et**	**C**	**A**
1	**Alkaloids**	-	+	+	-	-	+	-	+	+	-	-	+
2	**Anthraquinone**	-	+	-	-	-	-	-	+	-	-	-	-
3	**Cardiac glycosides**	+	+	+	-	-	-	+	+	+	-	-	-
4	**Coumarins**	-	-	+	-	-	+	-	-	+	-	-	+
5	**Flavonoids**	-	+	+	-	-	-	-	+	+	-	-	-
6	**Glycosides**	-	+	-	+	+	-	-	+	-	+	+	-
7	**Phenols**	-	+	+	-	-	+	-	+	+	-	-	+
8	**Reducing sugars**	+	+	-	+	-	-	+	+	-	+	-	-
9	**Saponins**	-	-	+	-	-	-	-	-	+	-	-	-
10	**Steroids**	-	+	+	-	-	+	-	+	+	-	-	+

11	**Tannin**	-	+	-	-	-	-	-	+	-	-	-	-
12	**Triterpenes**	-	+	-	-	-	-	-	+	-	-	-	-

4. UV Visible Spectral Analysis

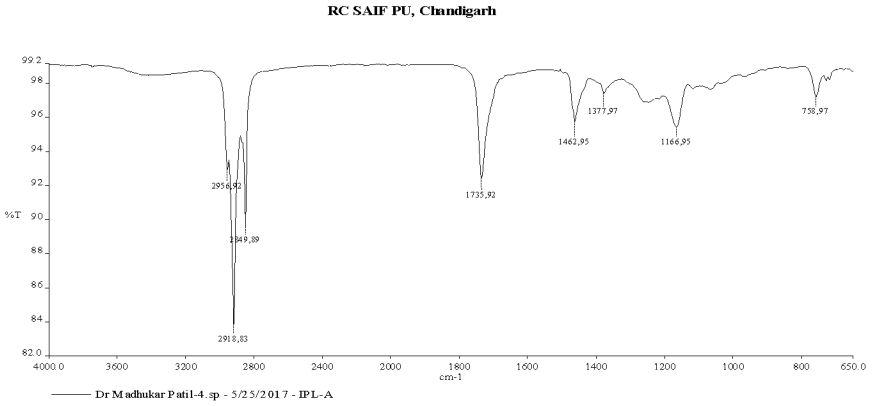


(a) Leaves Extract (b) Root Extract
UV Spectral Analysis of *I pilosum*
(60% conc. Ethanol *Extract*)



(a) Leaves Extract (b) Root Extract
UV Spectral Analysis of *I pilosum*
(60% conc. Chloroform *Extract*)

5. FTIR Spectral Analysis



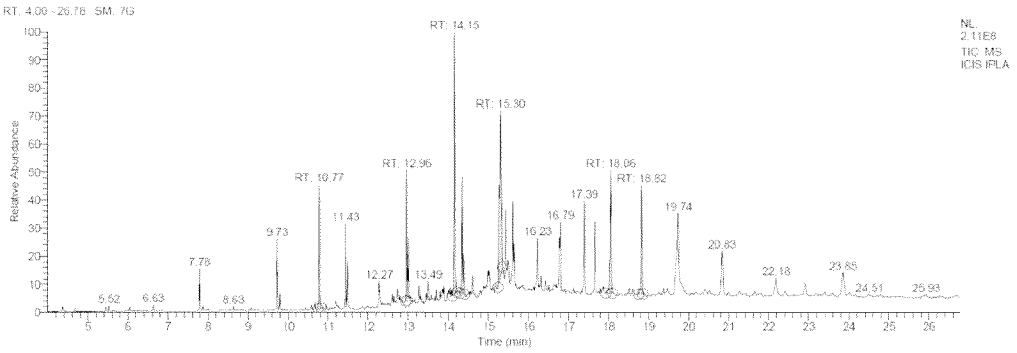
The FTIR spectrum interpretations of leaf in different solvent.

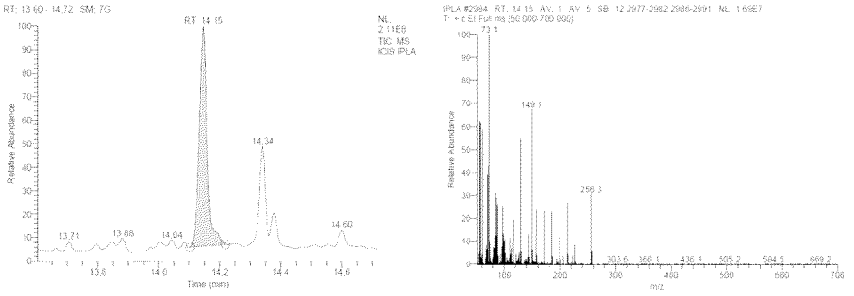
Acetone Extract

FTIR spectral peak values and functional groups obtained for the leaf extract (in different solvents)

Extracts prepared in	Peak values (cm-1)	Functional groups	Interpretations
Acetone Extract	2956,92	O-H Stretching	Amides
	2918,83	C-H Stretching	Alkane
	2849,82	O-H Stretching	Carboxylic Acid
	1735,92	C=O Stretching	Lactones
	1462,95	C-H Stretching	Alkane
	1377,97	C-O Stretching	Alcohol
	1166,95	C-Cl Stretching	Halogen
	758,97	C-Cl Stretching	Halogen

GC MS Results

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RT: 14.15
14.34
13.71
13.88
14.04
14.60
Relative Abundance
Time (min)
NL:
2.11E8
TIC MS
IOIS IPLA
IPLA #2994 RT: 14.15 AV: 1 AV: 5 SB: 12 2977-2982 2986-2991 NL: 1.69E7
T: + c EI Full ms [50.000-700.000]
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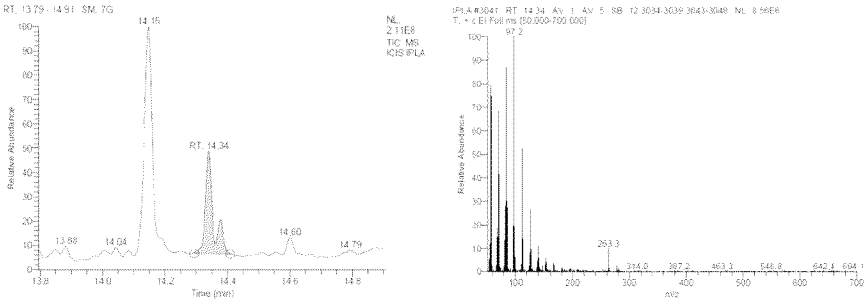
149.1
259.3
m/z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Relative Abundance
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IOIS IPLA
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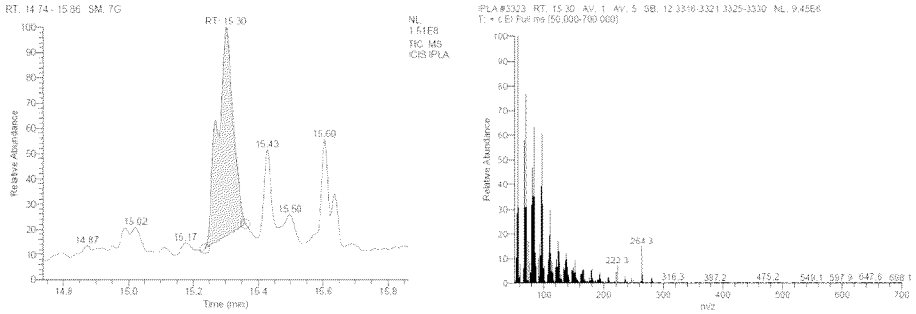
263.3
m/z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Relative Abundance
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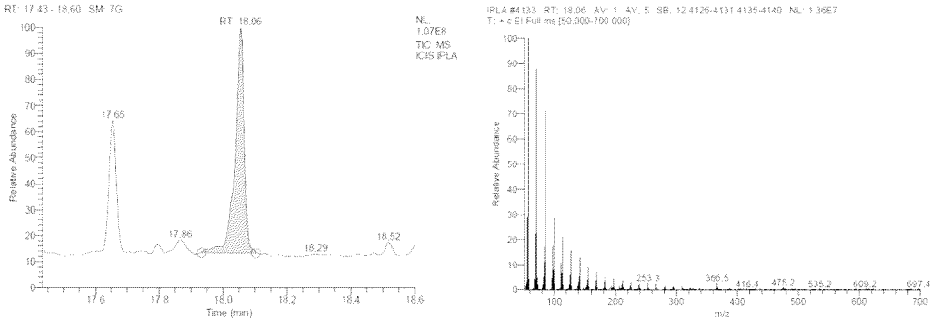
264.3
222.3
m/z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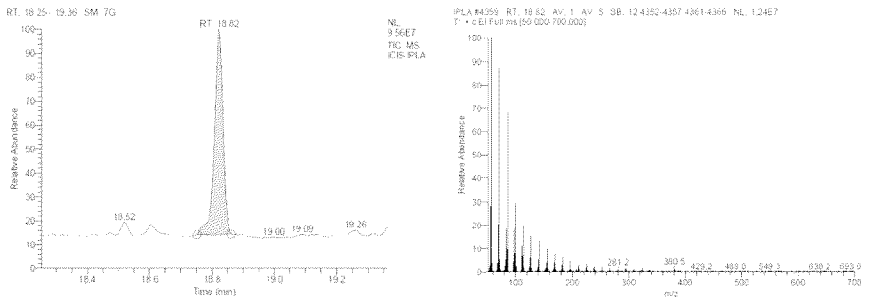

Conclusions

The current work from the survey and field observation its find that there is very significance medicinal important of *Catunaregum spinosa* among tribes. As wel as it has been found that iit has been used for multiple purpose in different area like fruit has an abortiffcient activity (Agrawal *et al.,* 1999), bark used for diarrhoea and dysentery (Chopra, *et al.,* 1956), sometime root bark past also important in rheumatism, relieve pain of bruises and bone aches during fevers and to disperse abscesses (Dastur *et al.,* 1962).

Lab and experimental reveals that Moisture content of Leaves (w/w), Stem Bark (w/w) and Root Bark (w/w) are 87.50%, 4600% and 59.50% respectively. Dry matter content of Leaves (w/w), Stem Bark (w/w) and Root Bark (w/w) are 12.50%, 5400% and 40.50% respectively. Ash content of Leaves (w/w), Stem Bark (w/w) and Root Bark (w/w) are 09.50%, 17.50% and 13.50% respectively.

For another Parameter in phytochemical test for different primary and secondary metabolites it find that different solvent are effected the positive of result. For leaves, Stem Bark and Root Bark sample it was found that except Anthraquinone, Coumarins and Steroids were not detected among all parameters in six different solvent.

UV Visible analysis graphical representation recorded between 300:1000 nm shows sharp peak in Leaf sample in 400 µl/ml of different extract.

FTIR spectral peak values and functional groups obtained in Methanol (ME) are five which showing five fictional group presence in leaf sample such as C-H bending C=C group, C-H stretching, C-H stretching and -OH group. In Chloroform (CF) and Ethyl acetate (EA) of leaf sample fined functional group are four and three respectively. They are C-H bending, C=O carbonyl group, C=O carbonyl group and C-H stretching in CF were C-H bending, C=O carbonyl group and C-H stretching in EA.

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14. Studies of Sublethal Effects of Cypermethrin and Oxyfluorfen on Reproductive Parameters of Earthworm Species, Eisenia Foetida Savigny, 18266

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Abstract

In common practice, sub lethal effects of pesticide are not regularly taken into account when assessing agrochemicals toxicity. With these objective sub lethal effects of the widely used pesticides was performed using *Eisenia foetida* as a model organism. Earthworm adults were randomly assigned to the treatment of these two pesticides. At the end of experiments number of adults, their weight, number of cocoons and juveniles were recorded. The result shows significant decrease in above parameters as compare to control animals. The pesticide treatment showed negative impact on the growth and reproductive parameters. The results suggest that in sub lethal dose the no target animal populations are at risk. So this study is important in agrochemical environmental risk assessment.

Key words: Pesticides, Sub lethal, Earthworm, Cocoon, Juveniles, Toxicity etc.

Introduction

A great proportional of biomass (780%) of terrestrial invertebrates is represented by earthworm which plays important role in structuring and increasing the nutrient content of the soil. Therefore, these animals can be suitable bio indicators of chemical contamination of the soil in terrestrial ecosystems giving an early warming of soil quality determination (Culy and Berry, 1995). Now, it is very important to protect the human health and health of other terrestrial vertebrates which prey upon earthworms (Beeby, 2001).

Eisenia foetida is the standard test organism used in terrestrial ecotoxicology, because it can be easily breed on variety of organic wastes and having short life cycle (ISO, 1998 and OECD, 2004). Studies show that earthworm skin is a significant route of contaminant uptake (Lord et al.,1980). Mortality has been the most frequently used parameters to evaluate the

chemical toxicity in earthworm (Van and van, 1989). Acute mortality test would not provide the most sensitive risk estimate for earthworms in the majority of cases (Frampton et al., 2006). Amorium et al (2005) tested earthworms with herbicide and found reproduction is the more sensitive end point than mortality in worms like *Enchytracus albidus* and *Euchytraeus luxurious*. It is suggested that sublethal effects is more sensitive and is a more realistic approach for the prediction of environmental effects. Because in the field, the exposure concentration of pesticides are usually quite low (Rombke et al., 2007).

Weight loss is another parameter, appears to be a valuable indicator of physiological stress, related to the degree of intoxication and time of exposure (Frampton et al., 2006). Numerous reproductive parameters have been studied in earthworms exposed to various xenobiotics, cocoon and hatching production, viability of worms produced.

Cypermethrin is a synthetic pyrethroid used as an insecticide in large scale. It behaves as a fast acting neurotoxin in insects and easily degraded on soil. It is highly toxic to fish, bees and aquatic insects. Similarly Oxyfluorfen is selective pre and post emergent herbicide used to control broadleaf and grassy weeds in vegetables. It is highly toxic to aquatic invertebrates. Scanty information is available on the effects of these pesticides on growth and cocoon production of earthworms. Therefore, present study is undertaken to find out the sub lethal effects of Cypermethrin and Oxyfluorfen on growth and cocoon production of *Eisenia foetida*.

Materials and Method

Biological Material: Earthworm species, *Eisenia foetida* were obtained from State Government agricultural nursery, Sakri (Dhule) M.S. They were maintained in the laboratory as per OECD guideline (OECD, 1984). Only healthy adult worms having well developed clitella were used for the experiment.

Chemical Material: Two chemicals i.e. commercially available Cypermethrin (10% EC) an insecticide belongs to synthetic pyrethroid and selective herbicide, Oxyfluorfen (23.5% EC) commonly called "Goal" were purchased from local pesticide shop. The quality soil and a month old cow dung were collected from agriculture field and cow shed respectively.

Experimental Set-Up: The experiment was performed in plastic tough having five kg capacities. A dried quality soil was ground and sieved. In a tough 800 g of fine soil thoroughly mixed with 200 g Cow dung (CD) and appropriate amount of water was added to moisten the mixture.

Treatment: The LC_{50} values of both the pesticide in earthworms were already estimated in our previous study, which was 2.240 ml/kg for Cypermethrin and 0.420 ml/kg for

Oxyfluorfen. Both lower ($1/4^{th}$) and higher ($3/4^{th}$) sub lethal doses i.e. 0.56 & 1.68 and 0.105 & 0.315 ml/kg of Cypermethrin and Oxyfluorfen respectively were added in 100ml of water and that was mixed thoroughly in the experimental groups only. On next day, 20 mature worms were added to each tough. The tough was covered with perforated lid and kept for 45 days. The experimental set up was prepared in triplicate for each treatment.

Study of reproductive parameters

At the end of experiment earthworms were separated by hand sorting washed with distilled water and kept on filter paper weight was taken to calculate the growth or biomass. Similarly the cocoons, number of juveniles are also hand sorted, count and tabulated, the data was statistically analyzed.

Result and Discussion

The control as well as $1/4^{th}$ and $3/4^{th}$ sub lethal experimental data after exposé of worm to pesticide concentration are presented in table-1. This shows that;

On Growth: In control sample significant increase was observed in body weight of earthworms while comparatively less significant increase was observed in both pesticides sub lethal treatment. Our results are corroborated with kobeticaya et al (2010) they reported that, *Eisenia foetida* is the most sensitive species and shown decrease weight in industrial wastes. Growth of *Aporrectodea caliginosa* significantly reduced in the exposure of Chloropyrifos and diazo non insecticidal treatment Espinoza and Obregon (2005) treated *Eisenia foetida* with organophosphate insecticide malathion and Parathion both observed decrease in body weight. Choo and Baker (1998) found Endosulfan did significant reduction in body weight and juveniles of *Aporrectodea trapezoids* species of earthworm. Zhou et al (2006) studied on worm speices, *Eisenia foetida* have reported that the weight of the earthworm was a more sensitive index compared to the mortality in indicating toxic effects of herbicide Acetochlor and Methamidophos. Further they also reported that weight loss in worms treated with fungicide and herbicide.

On Cocoon and juvenile Production: There was significant decrease in the cocoon production and number of juveniles count in Cypermethrin and Oxyfluorfen sub lethal treatments as compare to control. Cocoon production was found to be the most sensitive parameter for many pesticides (Yasmin and D'Souza, 2007). Bustas and Goicochea (2002) explored the effect of commercial parathion on the reproductive parameters such as sperm and cocoon production of *Eisenia foetida* and reported that alternations in reproductive parameters were conspicuous in regard to the number of sperm, cocoon and worms born. Number of juveniles per cocoon can be

regarded as sensitive parameters to evaluate the toxicity of Acetachlor on earthworm reported by Xiao et al (2006). Several scientists have reported that pesticides enhance the reproduction i.e. cocoon production and number of hatchings (Robidoux et al 2000). According to Zhou et al (2008) reproduction of earthworms appeared to be more severely affected by Cypermethrin at juvenile stage than at adult stage. Higher concentration of Cypermethrin causes significant toxic effect on reproduction of worms. Bagul et al (2015) reported that decrease in reproduction rate along with some morphological and behavioral changes of earthworm, *Eisenia foetida* exposed to acute toxicity of Cypermethrin and Oxyfluorfen. Similar results were reported by More et al (2016) they revealed that the silver coated dishes with waste food are not significantly affect on growth and mortality of earthworm but decrease the reproduction rate.

Conclusion

We conclude that;

- Growth and reproduction parameters of earthworms exposed to agro pesticides seem to be useful bio indicator of soil pollution.
- Results of the study provide evidence that sub lethal doses of pesticides affect on growth, cocoon and juvenile production.
- Higher ($3/4^{th}$) sub lethal doses showed slightly more effective than lower ($1/4^{th}$) sub lethal concentration.
- Finding of the present study can be used to plan and implement remediation strategies for the pesticidal polluted soils, where risk of soil pesticide contamination is associated with population dynamics of soil invertebrates.

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Pesticides	Vermibed Groups	Weight of worms (g)		% increase	Number of	
		Initial	Final		Cocoon	Juveniles
	Control	9 ± 0.5	16 ± 1.2	43.75	38	70
Cypermethrin	Expt. I (1/4th)	9 ± 0.6	10.6± 0.6	15.09	34	62
	Expt. II (3/4th)	10 ± 1.0	12± 0.5	23.07	22	46
Oxyfluorfen	Expt. I (1/4th)	9 ± 0.8	12.5 ± 0.4	0.28	32	64
	Expt. II (3/4th)	9.8 ± 0.7	14 ± 0.6	30.00	27	55

Table- 1: Biomass, cocoon and juvenile count

Per cent values are % change over control. CD (Mean + SEM, n = 3)

15. Study of Antibacterial Activity of Punica Granatum L. and its Phytochemical Analysis

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Abstract

Punica granatum L. belongs to family Punicaceae. The objective of the present work was to identify the phytochemical constituents and to study of antibacterial activity of pomegranate peel extract. *Punica granatum* L. are utilized by local people as the part of their meal and treat health diseases. Peoples supposed to consume *Punica granatum* seed and their peel was thrown as waste. Present study was designed to evaluate the antibacterial activity of *Punica granatum* L. peel against human pathogens. The extract was prepared using ethanol.The antibacterial property of pomegranate was tested against *E.coli*, *B. subtilis*, and *Pseudomanas* spp.Evaluations were based on the zone of inhibition using Agar well diffusion assay. The inhibitory activity was found to be zone of inhibition. This study represents that ethanol extracts and aqueous extract of waste material (peel) of *Punica granatum* L.may be utilize as a potential source of antimicrobial agents. The phytochemical investigation showed the presence of active chemical constituents such as alkaloids, tannins, flavanoids, steroids, cardiac glycosides and terpenoids.

Keywords : *Punica granatum,* Ayurvedic medicines, Antibacterial activity, Peel extract.

Introduction

Medicinal plants have been the mainstay of traditional herbal medicine amongst rural dwellers worldwide since antiquity to date. The therapeutic use of plants certainly goes back to the Sumerian and the Akkadian civilizations in about the third millenium BC. Hippocrates, one of the ancient authors who described medicinal natural products of plant and animal origins, listed approximately 400 different plant species for medicinal purposes. Natural products have been an integral part of the ancient traditional medicine systems, e.g., Ayurvedic. Over the years they have assumed a very central stage in modern civilization as natural source of chemotherapy

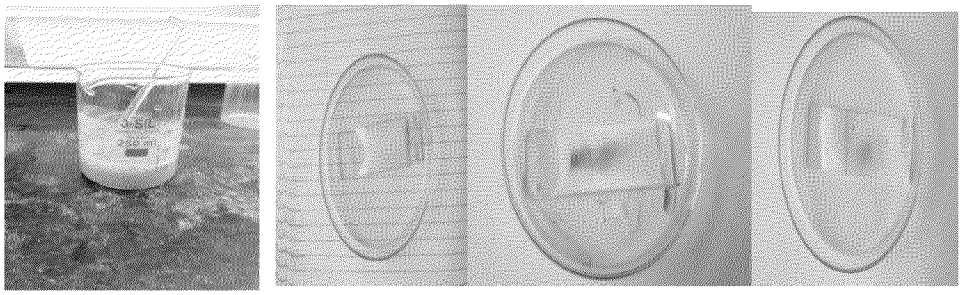
as well as amongst scientist in search for alternative sources of drugs. Recently, a number of antibiotics have lost the effectiveness due to the development of resistant strains of bacteria, which has primarily occurred through the expression of resistance genes (Davis, 1994; Service, 1995). In addition to inducing resistance, antibiotics are sometimes associated with opposing effects such as hypersensitivity, immune suppression and allergic reactions(Ahmad *et al.*, 1998). Therefore, there is a need to develop alternative antimicrobial drugs for the treatment of infectious diseases (Berahou *et al.*, 2007; Salomao *et.al.*, 2008).As part of our effort to reach this aim, we evaluated the antibacterial activity of some plants used in Moroccan traditional medicine. The pomegranate (*Punica granatum* L.) belongs to the Punicaceae family.

About 3.4 billion people in the developing world depend on plant-based traditional medicines. This represents about 88 per cent of the world's inhabitants, who rely mainly on traditional medicine for their primary health care. According to the World Health Organization, a medicinal plant is any plant which, in one or more of its organs, contains substances that can be used for therapeutic purposes, or which are precursors for chemo-pharmaceutical semi synthesis. Such a plant will have its parts including leaves, roots, rhizomes, stems, barks, flowers, fruits, grains or seeds, employed in the control or treatment of a disease condition and therefore contains chemical components that are medically active. These non-nutrient plant chemical compounds or bioactive components are often referred to as phytochemical. Phytoconstituents are responsible for protecting the plant against microbial infections or infestations by pests. The study of natural products on the other hand is called phytochemistry. In this way to create the scientific evidence for the natural *Punica granatum* selected for the antibacterial and antifungal activity and taken for Phytochemical screening. *Punica granutam* is also well known by different local name like dalimb, anar, and pomegranate. The phytochemical constituents were studied by qualitative analysis for performing various chemical tests.The medicinal parts are the root, the bark, the fruits, the peel of the fruit and the flowers. Various parts of *Punica granatum* have been used for various medicinal purposes.. With regard to the popular therapeutic uses of pomegranate, it has known as an anti-diarrhoeal, antiparasitic agent,ulcers, diuretic, and an antibacterial activity. The pharmacological functions of pomegranate include antioxidation, anti-tumour anti-hepatotoxicity, and anti- inflammatory. Although many studies have reported the antibacterial activity of pomegranate but it did not revealed enough studies about its effect on bacterial resistance, and did not determined the most effective part of the plant in dealing with

bacteria, whether peel of the fruit, leaves, flowers, or seeds of the pomegranate. The objective of present study were to evaluate the antibacterial activity of ethanolic and aqueous extract of *Punica granatum* L. peel on selected bacteria like *E.coli, B.subtilis,Pseudomonas* spp.

Material and Methods

1.For the detection of flavenoids:-For the detection of flavenoids 1gm rind powder mix with 10ml ethanol and heat it in water bath at 70°C for 10 minutes and after cooling filtered it well. By preparing TLC plate place a drop of filtered on base line slide dipped in solvent system(n-Butanol, acetic acid and water mix together in 4:1:5 ratio) formation of yellow spot shows presence of flavenoids

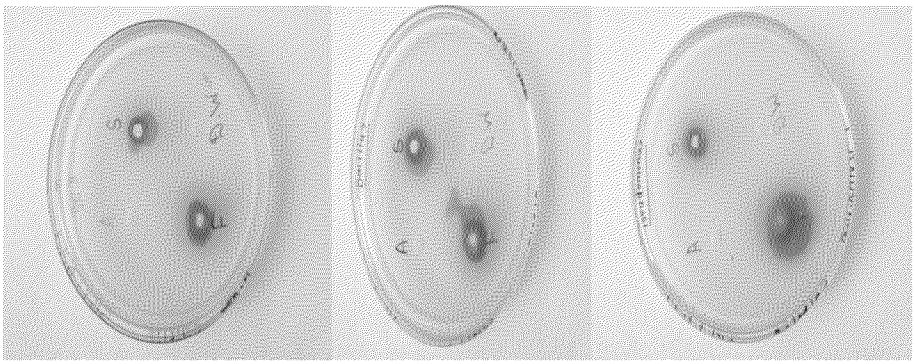


Aqueous ex. Alkaloid Sterole Flavenoids .

2. Assessment of Antibacterial Activity of Aqueous Extract

The screening of aqueous extract of peel of *Punica granatum* was carried out using agar well diffusion method. The bacterial and l strains for the study were obtained from Sanjivani Arts, Commerce and Science college, (Dept. of Microbiology) Kopargaon. The bacterial strains used for study are *Escherichia coli*, *Pseudomonas* spp and *Bacillus* spp.From bacterial cultured slants, several colonies were transferred to 5ml of sterile distilled water. It is mixed for some seconds to ensure homogeneity and further diluted.Nutrient agar was prepared as bacterial media and sterilized. All glassware's, borer, petriplates, extract dilutions were sterilized in autoclave. In aseptic technique, using sterile swab a bacterial lawn is made on sterile petri plates from microbial inoculums suspension. Swab is made in one direction by rotating plate at 90°. An agar-well diffusion method was employed for determination of antibacterial activities. Fourwells (0.5 in diameter) were cut from the agar with a sterile borer from three different plates and 60µL each alkaloid, sterole, flavenoid and distilled water solutions were delivered into them. Sterile water is kept as control. The inoculated plates were incubated at 37°C for 24 h. Antibacterial activity was evaluated by measuring the diameter of inhibition zone (DIZ) of the tested bacteria.

The inhibitory DIZ was expressed in millimeters. . After 24 hours the plates was examined for zone of inhibition.

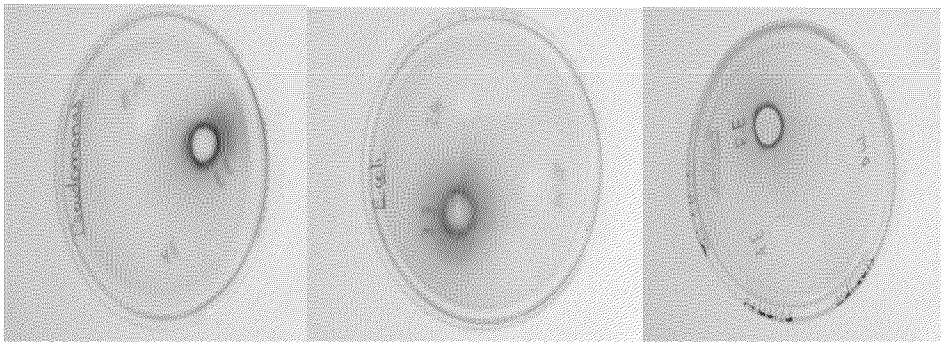


Zone of inhibition on *E.coli* *Bacillus* spp *Pseudomonas* spp

3. Assessment of Antibacterial Activity of Ethanol Extract

The screening of ethanol extract of peel of *Punica granatum* was carried out using agar well diffusion method.

Same method was applied which is used for aquous extract.



Pseudomonas *E.coli* *Bacillus* spp

Zones of inhibition

Result and Conclusion

The phytochemical analysis shows the presence of Alkaloids, Sterols and Flavonoids by TLC methods by preparing solvent systems and spots were detected in such a way that,alkaloids shows orange- brown spot.sterols shows blue spot. Flavonoids show yellow spot.The result of antibacterial property on *Punica granatum* L.peel extract by using microorganisms *E.coli, Bacillus spp. , Pseudomonas spp.*,forms the inhibition zone on aqueous and ethanol extract poured on Nutrient agar plates. The ethanol extract forms large inhibition zone as compare to aqueous extract.

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16. Study of the Prominent Issues in Farming

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Abstract

In the present research article, the author is trying to find the problems faced by Indian farmers and their probable solution in spatial manner. From last thousands of years, it had paved ways to the human beings for their overall development. From last many centuries, farming has played important role in the overall development of human being. Farmingis the oldest occupation of the human being. Because of the farming,the wondering human beings stated to settle down in one place and area. But from the inception of the industrial revolution of 1750'sfarming population started to work in Industries, form then onward the importance of farming in eyes of the government and policy makers started to fall.Because of this approach problems of farming were unanswered.

Introduction

Steps have been taken to improve soil fertility on a sustainable basis through the soil health card scheme, to provide improved access to irrigation and enhanced water efficiency through PradhanMantri Gram SinchaiYojana, to support organic farming through Paramparagat Krishi VikasYojana (PKVY) and to support for creation of a unified national farming market to boost the incomes of farmers"[1] (India 2017, Govt. of India). "Farmingplays a vital role in India's economy.Nearly three-quarters of India's families depend on rural incomes.The majority of India's poor about 70 percent are found in rural areas.When we talks about the development of India, we must not forgot to consider the Farming development also. Without farming development one country can develop in the World. Nearly 55 per cent of the population is engaged in farming and allied activities (census 2011) and it contributes 17.4 per cent to the country's Gross Value Added. Given the importance of farming sector, Government of India took several steps for its sustainable development. But still the state of the farming in India is not yet improved.

Problems and their Probable Solutions to Farming in India

Uneconomic Land Holding Size

In India due to inheritance law, farmingland gets divided into legal hires of the dead farming farmer. India has highest low size of land holding in the world. It is the need of the hour to merge the land in one large farming farm. And all framers of the land may practice farming together. It may be called as community farming.

Uncertain and Erratic Monsoon

Farming in India is gamble depended on the Monsoon. If Monsoon fails it severely affects the farming production. To avoid this problem we must have state-of-the-art weather forecasting mechanism for the each tehsil and block of the India.

Fake Seeds

Due to fake seeds the crop fails to grow. The government should sale the standard seeds to farmers with the help of the NGO's. There should be stringent law to punish the sellers of the fake seeds.

Problem of Crop Insurance

The system of crop insurance in India is not yet developed. Farmers also not much aware of the same. The claim settlement of crop insurance is very low in India. The government and crop insurance companies should simplify the procedure of claim settlement.

Unavailability of cheap bank loans

The farmers in India are debt ridden. Many banks offer very less bank loan with higher rate of interest. It is the need of the hour to offer the bank loan in less interest.

Money Lenders Trap

Because of the unavailability of the cheap bank loan, farmers of India often due to severe financial problems take loan from local money lenders in higher rate of interests.

Old Methods of Farming Practice

Especially Indian farmers of rural area are still using the old and out dated unsustainable farming methods for the crop cultivation. Despite governments efforts they are reluctant to use the modern methods of farming. We as social community should encourage them to use the modern methods of paddy cultivation.

Less mechanization of Farming

Indian farmers have least mechanization of farming as compared to the other developing countries of the world. Governments, NGO'S and Social Groups should intervene to enhance the use of mechanization in farming farms. Government should deploy the different farming machines for the 2-3 villages.

Lack of Farming Training and Farming Education

In India Farming is a traditional occupation. There is no formal institution which has syllabus or curriculum to teach the farming farmer the new ways of farming. It is the need to establish such farming schools at least each at tehsil or block level.

Farming as a Lest Favorable option as a career

Due to industrialization and availability of other white collar jobs, farming has lost its status as 'option' for the Employment. If we talk to youths, they are not interested to take farming as a carrier option. This mind set has to change. To change the mindsets of the people we have to make corporatization of the farming. At least we should promote some youth faces to other job aspirants as a hero.

Less Availability of a Market

If poor farmer wants to sell the farming products, they find it very difficult to sale the same in the market, due to the market may be far away of they are not able to get the reasonable selling prize for its products. There is a need to establish sustainable market for them to get handsome prize wheatear it is local or foreign market.

Poor Soil Health

Due to excess use of fertilizers, pesticides, deforestation the health of the soil got deteriorate. We have to use the environmental friendly methods for the soil conservation. We need to plant more and more trees and have to use less fertilizers and pesticides.

Underused used Irrigation Projects

India has high irrigation potential but this potential is not yet exploited fully. We need to complete the irrigation projects within time frame. And we have to create such a mechanization to provide water of the irrigation projects should reach the last farmer of the village.

Prevalence of poor economic condition

The economic condition of the rural farmers is not good in India. That is the main hurdle for the overall development of him as well as farming at large.

Intensive Subsistence Farming Practice

Due to small land holding of the farming land, the farmers are unable to grow the farming product to sale in the market. They are just doing farming just to sustain.

No job after the showing period

Most of the Indian farmers become jobless after the showing of the Kharip crop.It's the time to provide at least 180 days of employments through the MNREGA Scheme.

Import and Export Policy of the Government

Due to governments import and export policy and their late implementation the farmer not able to get the good selling price at International market. At the same time government allows to sell the importedfarming products without considering the interests of thelocal Indian farmers. So this practice of the policy implementation has to change.

Global Warming, Climate Change

Due to Global Warming and Climate Change Indian farming has change a lot. This global phenomenon has affected the farming produce very adversely. To counter this we have to apply sustainable and environmental friendly practicesto save environment as well as our farming.

Long Pending Land Cases in Courts

Many land related court cases have been pending for more than 15 to 20 years. This has created the negative impact on the mindsets of the farmers. Once a court case filed for a particular land, in that case those lands become disputed and no one is allowed to cultivate it. So, its waste of valuable farming land. To deal with the farming related cases special fast track courts have to set up for the speedy justice.

Grain Storage Facilities

Many time final product of the farming become waste due to unavailability of the proper storage facility at villages. Sometime natural untimely rain and natural disaster affects the crop produced. Government should build the proper rent free store houses to store the farming products.

Minimum Support Price (MSP)

Indian farmer mostly try to cultivate the crop which has high market value as well as for which government have declared the Minimum Support Price (MSP). But some time government

delays to announce the MSP. Due to this farmers are not able to crop the profitable crop or some time they get less amounts as a MSP. This situation has to change from government side.

Low Yielding Verities of Seeds

Due to poverty High Yielding Verities of Seeds are not purchased by the poor farmers. Instead they plant the Low Yielding Verities of Seeds. It results into the less production. This situation has to change with the availability of poverty High Yielding Verities of Seeds in low prices.

Inadequate Transportation Facility

Cheap and affordable transportations facility is not available to the farmers of rural and remote areas. Which result in to the loss of the farming product and valuable resources as well.Government should expand the public transport facility to the rural and remote areas of India. We should have emergency and free pick up vehicles to get the agricultural products to the market.

Land Mafia

The land mafia deliberately and forcefully converting the farming land into the non-farming. One land become non-farming, we lost the land permanently. This is a waste of valuable land resource.

Land Acquisition for Government Projects

The public projects government acquires the farming land without proper rehabilitation of the farmers. They also are not getting paid handsome money for the land they lost. We are losing the good farming land permanently.

Conclusion

India is a waste farming country having highest number of poor farmers. Whatever we plan at government level we should not forget the poor farmer's development. Without development of them we cannot ensure the development of India. Agricultural productivity depends on several factors. These include the availability and quality of agricultural inputs such as land, water, seeds and fertilizers, access to agricultural credit and crop insurance, assurance of remunerative prices for agricultural produce, and storage and marketing infrastructure, among others. We have to consider all of these factors for the development of the farmers and farming in India. We have work as team viz. Government, NGO's, Corporate Social Responsibility to solve the problems of Indian farmers.

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17. Surgical Techniques for Culture Pearl Production in Parreysia Corregatein Waghur Dam Near Jalgaon (M.S.)

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Abstract

Present study deals with Surgical Techniques for culture pear production in Parreysia corregatein Waghur Dam near Jalgaon (M.S.). Fresh water mollusks viz. Lamellidens marginalisand L. corrianus produce pear but Parreysia corregate is also commonly found in fresh water bodies in north Maharashtra region. Parreysia corregate is abundantly found in Waghur dam in Jalgaon region. Surgical technique is very much important pearl culture because pearl formation depends on nucleus and implanted graft tissues present in collumella of animal. Different surgical techniques are important during the process of pearl production which can be helpful for getting desire quality and variety of pearls.

Keywords: Surgical Techniques, pearl, Parreysia corregate, Waghur Dam

Introduction

The history of pearl has more ancient and legal as compare to other ornamental products. The credit of pearl cultivation and production goes to Chinese and Japanese but advanced technique developed by Australian people. In India fresh water pearl culture is a highly compensative flourishing aquaculture industry in India. Parreysia corregate is the most commonly available freshwater mussel distributed all over the country and is the important species used for pearl culture technique. Natural pearls are formed when an nuisance such as grain of sand is swept into the pearl mollusk and is embeded within the shell where it gets coated micro thin layer of nacre, a silvery substance that is about 90% $CaCO_3$ (Barik, 2004). Cultured

pearl production are produced popularly by cavity-insertion method, where a shell nucleus is placed into the umbonal cavity betweenthe outer mantle layer and inner shell surface (Janaki Ram, 2003). Quality of pearl is arbitrated by a variety of factors such as shape, size, colour, lustre, surface clarity and weight. Round pearls are the most treasured and the most difficult to cultivate. It is very rare to find a perfectly round pearl. Cultured pearls are classified on 6 basic colours such as pink, white, black, blue, grey cream, gold,and silver. Nucleus is one of the most imperative items used in the process of cultivating pearls, it is the base on which the nacre forms and can regularlydirective the quality of the finished pearl. The present work deals with the detail of the pearl culture surgical techniques which are vital to get a better quality pearl and to get a good market price and helpful to unemployed person.

Material and Methods

In present work freshwater speciesParreysia corregate is used for surgical pearl cultivation technique.Amongst this species is the most commonly available mussel distributed all over the north Maharashtra region. It is a prolific breeder with the spawning occurring during March to April and between September to early December. For the implementation of pearl nucleus theParreysia corregate were collected and the following procedures were adopted.

The auspicious season for the bead implantation is from February to April with an average temperature of 20-30°C. The vigorous donor mussel and recipient mussels were collected and kept in the glass aquaria. From the donor mussels a portion of the mantle epithelium from the posterior to middle pallialregion was cut into small pieces having length of 2-4 mm as graft tissues for implantation. The prepared graft tissues were soaked in 1% Neosporin solution for sustaining moisture and0.85% physiological saline solution for keeping them free from bacterial infection and effective and ready for implantation. The recipient mussels were kept in water ventrally upward with menthol and as soon as they opened the shell valve a wooden peg was implanted by means of a shell-valve opener without damaging the muscles. The mussel was then attached by a mussel holder. A small slit was made by a sharp knife inside the mantle. The nucleus soaked with mercurochrome solution was then placed in the silt with a graft tissue beneath the nucleus. The slit was then closed by the blunt end of the needle. The mussels were then removed from the holder and the peg was pulled out to allow the shell-valves to close (fig.1 and 2). Then the nucleus inserted mussels were kept in enclosed nylon perforated cages dangled with bamboo poles and kept at subsurface water column in aquarium.

But it has been found that better deposition of nacreous layer was in the implanted mussels kept in substratum with circular water movement while survival percentage was good in the mussels reared in suspended condition with circular water movement (Sujit Das., 2005). After a month, the mussels were taken out to study whether the inserted nucleus and tissues are in proper place or not and the dead mussels were detached. Formation of pearl takes around ten to twelve months and depending on the physicochemical parameters water body.

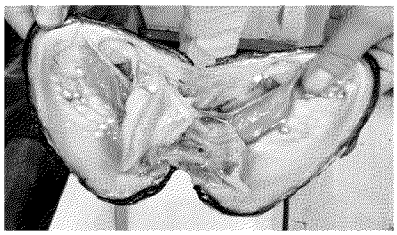

Fig.1: Operated mussel

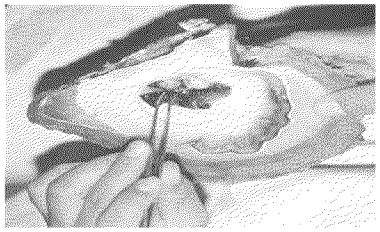

Fig.-2: Removed unwanted tissues.

Result and Discussion

Surgical Techniques for culture pearl production in Parreysia corregate is very much important in the effective pearl culture technique because the pearl formation depends on the nucleus and the implanted graft tissues. The nucleus must meet the parameters as low relative cost, complete availability, thick profile, white base colour and composition similar to mussel shell. Shell material is predominantly the material used for round pearls. Now-a-days artificial bead prepared from mussel shell powder showed the acceptance of 100%. The colour and luster of the pearl is primarily due to the nature of secretions of the implanted mantle graft (Janaki Ram et al., 1994).After a culture of one year, a survival of 80% and 15% nucleus rejection was observed. 50% of the implanted nucleuses were found coated with nacre; out of which 7% were of good quality round pearls ranging between 2-4mm and about 1.5% were small rice pearls (Dube 2003). Nuclei must have the similar density to the mussel shell near 2.80g/cc for commercial weight reasons (Maheswaran, 2003).

Conclusion

Fresh water pearl culture in India has very good potential with availability of the pearl mussel and water resources, this could be taken up for the upliftment of the rural economy. Therefore, with good management practices survival of implantedmussels can be increased. There is a need to pay attention towards the artificial pearl cultivation for self-employments and as a subsidiary income point of view to the Indian farmers.

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18. Taxonomy of Medicinal Plant Diversity, Indigenous uses and Conservation Status in Nashik District, Maharashtra

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Abstract

The present study deals with the medicinal plants used in various traditional system of medicine in Nashik District. Medicinal plants survey was conducted during year 2011 to 2016 in various places during different season. Medicinal important plant species was collected through different locality. Information related to different plants which are used by local community in the treatment of many common diseases and well-being in the area was collected. Data on the use of medicinal plants were collected using structured interview of Trible, thorough observations and conversations with local communities. This paper communicate total 21 angiospermic plant species used for medicinal purpose were recorded during the intensive survey. The different parts of the plants are used to cure several kinds of illnesses. The leaf is predominantly used and is followed by roots. Knowledge about some medicinal plants used by the rural people as a phytoremedy is tubers, rhizomes and whole plants. The herbal medicines consist of principal drug. The correct botanical names, local names medicinal preparation, mode of administration etc. are reported as gathered from the natives such as Bhil, Konkani, Mahadeo koli, Pawara, Banjara, etc. Knowledge about medicinal plants, which are used in their daily life against various ailments are carefully gathered. .some commercially important medicinal plant species are facing threat due to habitat degradation over exploitation and unsustainable harvesting in the study area.

Keywords: Traditional knowledge, medicinal plants, indigenous uses of Nashik district

Introduction

Plants are always considered as a primary source of drugs in traditional and alternative system of medicine in various forms such as crude form, juice, decoction, and crude extracts. About 80%people of the world, particularly in the rural areas of developing countries, continue using traditional resources in healthcare. Indian subcontinent is renowned for its cultural and plant biodiversity where large numbers of people are still living in tribes. These tribal people possess a pool of undisclosed, medicinal and pharmacological information regarding the flora of their surrounding area which may prove to be very helpful in rural community with its advantage. Natural wealth as well as the undisclosed Pharmacological information and the tribal cultures have been decreased remarkably at a disturbing rate due to change in life style. Therefore, it is necessary to discover and document this exceptional, original, and conventional information of the Tribal population, before it disappears with the knowledgeable persons. It is also for the establishment of these conventional principles at the national and international level realizing the recent global trends. These people explore the medicinal prosperity of the area. Therefore, the present study was proposed to identification and documentation of plant species used for the treatment and prevention of various diseases and ailments in the study area.

Methodology

The medicinal plant surveys have been carried out in different seasons in their various tribal-dominated and rural areas of Nasik district. Plants were collected in the field and confirmed through the tribal healers from their location in various forest patches. Group interviews were organized bringing plants from surrounding areas, showing them to tribal men and women or taking knowledgeable tribal heads, with Doctors, Vaidays and Buwas into the forests. Repeated inquiries were made and the information was verified in different seasons and areas of the district. Every attempt was made to locate medicinal plants. Medicinal plants were identified with the help of floras (Lakshaminarshiman, and Sharma 1991, Kshirsagar and Patil 2003 and Shah 1978). Voucher specimens are housed in the Herbarium of P.G. Department of Botany, S S V P S's L K. Dr. P .R. Ghogrey Science College, Dhule Maharashtra,. In the following enumeration, the taxa are arranged alphabetically, followed by the name of family, vernacular names and medicinal uses of plants.

Systematic Enumeration

Clematis gouriana Roxb. (Ranunculaceae Juss) Hort. Beng. (1814) p. 43. Fl. B. I. v.1, p 4: Grah. Cat. p.1; Dalz & Gibs. P. 1; Trim Fl. Ceyl. y.1p.2; Talb. Trees Bomb. p.1; Woodr. in Journ. Bomb Nat. V. 11 (1897) P.119; watt. Dict. Boon. Prod. V2p.369. *C.Vitabla* var. *gauriana* Kuntze, Monogr. Blem. in Verh Bot. ver. Brandenb 26 (1885) P.100.

Climbing to a great height, usually glabrous, except the young parts stems grooved, brown. Leaves pinnate, bipinnate or tripinnate leaflets ovate or oblong, acuminate, entire or coarsely toothed, rounded or cordate at the base, strongly nerved and reticulately veined, upper surface shining petioles long, slender.

Fls. & Frts.: November-March

Local Name: or-vel, Belkum, Morata, Churanhar

Locality: Igatpuriforest

Threats: The loss of habitat is being seen as one of the major causes of threats to biodiversity of *Clematis gouriana*

Ecology: Climbing herbs found throughout Nashik district among bushes

Distribution: Western Ghats & Eastern Ghats, Dry Deciduous to Evergreen Forests. Native to China.

Medicinal Uses: Used in Ayurveda. Whole plant said to be poisonous, stem and leaves bitter, the juice of freshly crushed leaves and stems has a vesicant blistering action. Whole plant juice applied on forehead for cold, headache, wound healing, antimicrobial. Leaf extract applied externally for eczema, boils, itches; leaf paste applied to scabies. (Kirtikar and Basu, 1981).

Field collection number: RVK 471

Michelia champaca L.,(Magnoliacease Juss). Sp. Pl. 536.1753; Hook.*f.* & Thoms. in Hook. *f.* Fl. Brit. India 1: 42. 1872; Cooke, Fl. Pres. Bombay 1:8. 1958 (Repr.ed.).

Trees, 7.5.m tall, evergreen, bark brown. Leaves 6-16 x 3-6 cm, elliptic- lanceolate. Flowers yellow, fragrant, axillary, solitary. Capsules orbicular, warted. Seeds2, scarlet, rounded on back.

Fls. & Frts.: Almost throughout the year

Local Name: Sonchapha

Locality: Trimbakeshwar

Threats: Actually *Michelia champaca* are not threatened taxa but these taxa are exploited commercially. Severe threat due to various factors such as increasing population, environmental degrader, reasons for their depletion.

Ecology: *Michelia champaca* is an occasional trees in low and medium elevation evergreen forests, up to 2400 m. Also cultivated

Distribution: Throughout Nashik district. *Michelia champaca* is native to Indonesia, India and other nearby lands.

Medicinal Uses: The traditional uses of this plant in the treatment of diabetes, wounds, inflammatory conditions, worms, infestations and malarial fever. Dried roots powder and root bark (10 gm: 10 gm) have been mixed and taken in night after meal by the tribal and rural people as a safe purgative. Also, the same (dried roots powder and root bark) mixed with curdle milk to form a thick paste and applied externally in abscesses. Leaves juice (10 ml) along with equal amount of honey is recommended by the tribal physicians in the treatment of colic and other gastrointestinal disorders. Two three leaves along with chameli Jasminum humile leaves have been chewed by the rural people to cure oral ulcers. (Chopra and Chopra, 2005).

Field collection number: RVK 128

Anamirta cocculus (L.) (Annonaceae Juss).Wight & Arn. Prodr. 446. 1834; Hook. F. & Thoms in Hook. *f.* Fl. Brit. India 1 :98. 1872; Forman in Kew Bull. 32 : 329. 1978. Menispermum cocculus L. Sp. Pl. 340. 1753. *Anamirta paniculata* Colebr. in Trans. Linna. Soc. 13: 66. 1822; Cooke, F1. Pres. Bombay 1: 20. 1958 (Repr.ed.).

Shrubs, climbing, dioecious. Leaves 10-15 x 7-10 cm, ovate, cordate, and glabrous except for small tufts in the principal nerve axils. Inflorescence panicled, glabrous, branched, drooping. Flowers ca 2 cm in diam. Drupes ca 1 cm in diam. subreniform-globose, glabrous, white turning black at maturity.

Fls. & Frts.: November -February

Local Name: Kakamari, kakmari

Locality: Kelzer

Threats: Serious threats to this plant is one of the main reasons the local people fry the seeds before using it

Ecology: Growes on thick forest. Large woody climber spreading over large trees.

Distribution: Occasional in Nashik.

Medicinal Uses: According to Ayurveda, the plant pacifies vitiated kapha, vata, ulcer, inflammation, chronic skin diseases, bronchitis, cough and used for rapid evolution of uterus.(Kritikar and Basu, 1975).

Cissampelos pareira L. var. ***hirsuta*** (Menispermaceae Juss). (Buch-Ham.ex DC.) Forman in kew Bull.22:356.1968.C *pareira* L. Sp. Pl .1031.1753; Hook.f.&Thoms. in Hook. *.f.,* Fl.Brit.India 1:103.1872;Cook,Fl Pres.Bombay 1:24.1958(Repr.ed).

Slender, dioecious twiners, woody at base, glabrous, younger parts pubescent. Leaves 3-7 x 3-10 cm, alternate, silky-pubescent beneath, minutely mucronate, petiolate. Flower minute, greenish-yellow; male in axillary panicles; female in pendulous recemes. Drupe nearly orbicular or subglobose glabrescent or hairy, red when ripe.

Fls. & Frts.: July-October

Local Name: Velvet *Leaf*, Abuta, Pahadvel

Locality: Saler

Threats: Often grazing.

Ecology: Found in association with C*ocolus villosus*

Distribution: Occasional among shrubs and small tree in forest. Native to India.

Medicinal Uses: The root of the abuta is used in tropical countries to prevent a threatened, miscarriage and to stop uterine hemorrhage after child birth. In the Amazon, still carry abuta with them for menstrual cramps, pre and postnatal pain excessive menstrual and uterine hemorrhaging. The root is antipyretic, diuretic and laxative and used in gonorrhea and chronic inflammation of the bladder and enlargement of spleen. (Kaushik and Dhiman, 2000).

Field collection number: RVK 174

Cocculus hirsutus (L) (Menispermaceae Juss). Diels in Engler, Pflanzer.46:236. 1910; Santapaui in Rec Bot. Surv. Ind 16 (1):5.1953. *Menispermum hirsutum* L., Sp. Pl. 341.1753. *Cocculus villossa* DC., Syst.1:525.1818; Hook. *F.*, & Thoms. In Hook. *F.*, Fl Brit. India 1: 101.1872; Cooke, Fl. Pres. Bombay 1: 22. 1958 (Repr.ed).

Woody twiners. Young parts densely grey hairy. Leaves very variable in size and shape, usually ovate, 2-7 x 1.5-5.5 cm. Flowers small, dull green; male in axillary, short panicles; Females 2-3 in axils. Drupes laterally compressed, deep purple or blackish when ripe, transversely rugose, ca4 mm in diam.

Fls.& Frts: November-April

Local Name: Vasanvel

Locality: Mulher

Threats: Often grazing

Ecology: Found in association with *Daemia extensa* on bushes, shrubs

Distribution: Common on bushes and tree in hilly forest Native to Tropical Africa east to India and Nepal.

Medicinal Uses: Leaf decoction and root past is used for rheumatism.

Root and leaves have great medicinal value and used both internal and external purpose. Root is bitter and used as a tonic and antiperiodic in fever in malaria, and used for the joint pain treatment.(Vardhana,2008).

Field collection number: RVK 337

Tinospora cordifolia (Willd.) (Menispermaceae Juss). Mires. in Ann. Hist. Nat.Ser.3,7:38.1851; Hook., *f.*& Thoms. in Hook, *F.* Fl. Brit. India 1:97.1872; Cooke, Fl.Pres. Bombay 1:20.1958(Repr. Ed.) *Menispermum cordifolium* Wild., Sp. Pl. 4: 826.1806.

Deciduous, woody twiners with striate or lenticulate green branches. Extensive filiform, aerial, photosynthetic roots present. Bark loose, grey-white. Leaves 5-8 cm in diam., membranous, glabrous, 5 to 7-nerved, roundish, cordate. Flowers yellowish-green, in axillary recemes. Drupes red, 5-8 mm in diam . Seeds ventrally grooved.

Fls. & Frts : September-April

Local Name: Gulvel, giloe

Locality: Saptashrungi hills

Threats: Over exploitation by natives

Ecology: Occasional on bushes and tree in hilly forest

Distribution: Native plant from India. Found throughout India

Medicinal Uses: In winter, season decoction of stem is used as general tonic in weakness, also useful in chronic fever, diabetes. Recently it is chemically proved that, stem juice is also highly effective in improving memory & intelligence. It is used for treatment of Jaundice, diabetes, and rheumatoid, arthritis and heart tonic. (Kirtikar and Basu, 1981).

Field collection number: RVK 155

Cardamine trichocarpa Hochst. (Brassicaceae). ex A. Rich. Tent. Fl. Abyss. 1: 18. 1847. C. subumbellata Hook. ex Hook. f. & T. And. in Hook. f. Fl. Brit. India 1 : 138. 1872 ; Cooke, Fl. Pres. Bombay 1 : 32. 1958 (Repr. ed.).

Herbs, erect, small, much branched, annuals. Leaves 0.5 - 1.5 x 0.5 - 1.0 cm, pinnately segmented, segments 5 - 7, ovate or ovate-elliptic, glabrous. Inflorescence of racemes. Flowers yellow. Pods 1.5 -2.5 x 0.2 cm, green. Flat, linear-lanceolate. Seeds ca 2 x 1 mm, oblong.

Fls. & Frts.: July - December

Local Name: Magereganko ko

Locality: Adwadi, Sinner

Threats: Overgrazing

Ecology: Moist, slightly shady places in meadows and by streams, usually in acid soils

Distribution: Throughout Nashik. Native to Europe now a pantropical weed in Indian States.

Medicinal Uses: Infusion of the leaves has been used to treat indigestion and promote appetite. The leaves and the flowering plant are antirheumatic, antiscorbutic, antispasmodic, carminative, digestive, diuretic, and stimulant. They are used internally in the treatment of chronic skin complaints, asthma and hysteria. (Kritikar and Basu, 1975).

Field collection number: RVK 106

Rorippa indica (L.) (Brassicaceae). Hiern, Cat. Afr. P1. Welw. 26. 1896; Sant. & Wagh in Bull. Bot. Surv. India 5: 108 (1963) 1964. *Sisymbrium indicum* L. Mant. 1: 93. 1767. Nasturtium indicum (L.) DC. Prodr. 1: 139. 1824; Hook. f. & T. And. in Hook. *f.,* Fl. Brit. India 1:134. 1872; Cooke, Fl. Pres. Bombay 1: 31. 1958 (Repr. ed.).

Herbs, erect-diffuse, 15 - 45 cm tall, annuals. Leaves 6 - 8 x 2.5 cm, ovate- lanceolate; radical leaves petioled and inciso- pinnatified- pinnatisect, cauline leaves subsessile with subentire apex and dentate above base. Inflorescence of racemes, axillary and terminal. Flowers yellow. Siliqua 1.2 - 1.8 x 0.3 cm, linear, green and stalked. Seeds numerous, ca 2 mm long, incipient seeds yellow, mature ones red.

Fls. & Frts.: December - April

Local Name: Chamsuru

Locality: Igatpuri forest

Threats: Due to overgrazing

Ecology: Growing on roadsides, paddy sides, nursery garden, trench banks, forest margins, wall root and wet places on hill-slope roadsides, at altitude.

Distribution: Distributed throughout Nashik district. Native to Europe through central Asia, Africa, and North America.

Medicinal Uses: Cough-suppressing, phlegm-eliminating, and anti-bacterial. Pungent, bitter, warm. Expelling phlegm for suppressing cough, relieving exterior syndrome and dispersing cold, promoting blood circulation and detoxifying, disinhibiting dampness and removing jaundice. Dyspnea and cough, cold and pyrexia, measles with insufficient eruptions, rheumatic arthralgia, swelling pain in the throat, anthracia and furunculosis, dermatitis rhus, menostasia, injuries from falls, jaundice, edema. Oral administration: decocting, 10-30g, fresh products double in amount; or extracted juice for oral use. External application: appropriate amount, smashed for applying. Excess administration may lead to slight thirst and stomach disorder, but not affect follow-up treating. (Chopra and Chopra, 2005).

Field collection number: RVK463

Cadaba indica Lam.(Capparaceae Juss.) Encye. v. 1 (1783) p. 544. Fl. B.L. v.1, p.172; Grah. Cat P. 8; Dalz. & Gibs. p. 9; Trim. Fl. Ceyl. v.1, p. 60; Talb. Trees, Bomb p. 9; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 123.

A straggling much branched shrub stems terete, the older smooth, purplish, the younger pubescent yellowish-brown. Leaves simple, entire, elliptic-oblong, obtuse (rarely retuse), mucronate, reticulately veined glabrous, base rounded petioles long. Flowers dirty white in few-flowered, terminal, 1-sided racemes, the upper flowers corymbose pedicels long, pubescent bract 1 at the base of each pedicel subulate. Sepals subequal ovate-oblong, acute, exceeding pubescent outside. Petals spathulate, about equaling the sepals claw long, very narrow. Disk prolonged into a funnel-shaped expanded and toothed at the apex, mouth oblique. Stamens 4, inserted up the gynophores, much exerted.

Fls. & Frts.: January-March

Local Name: Indian Cadaba, kodhab, dabi, kadhab, habal.

Locality: Ghatandevi Igatpuri

Threats: Habitat loss. Due to overexploitation

Ecology: Found in heavy soils but is also found on sandy soils, stony slopes and. It is found in areas with an annual rainfall of 200–500 mm.

Distribution: Throughout India. Originated in India It is endemic on Indian Subcontinent: Bangladesh, India, Pakistan, Sri Lanka and Indo-China.

Medicinal Uses: Plant parts of *Cadaba indica* are widely used as an anti-inflammatory agent, for the treatment of colic, conjunctivitis, stomachache, and snakebite. Leaves are considered purgative, anthelmintic and anti-phlogistic anti-syphilitic, and employed in the preparation of medicated oils. Leaves are also used as a remedy for cough, rheumatism, fever, colds, dysentery and as poultice for carbuncles and sores. In Yemen, the leaves are used in the treatment of urinary infection and hemorrhoids. Leaf extracts are taken in India as a cure for liver damage. The roots possess medicinal properties similar to those of the leaves. (Kirtikar and Basu, 1981).

Field collection number: RVK 194

Capparis aphylla Roth, (Capparaceae Juss).Nov. P1. Sp. (1821) p. 238. FL. B. I. v. 1, p. 174; Grah. Cat. p.9; Dalz. & Gibs. p.9; Talb. Trees, Bomb. p.10; Woodr. in Journ. Bomb. Nat.v.11 (1897) p. 123; Watt, Diet. Econ. Prod. v.2, p.130. *Sodada decidua* Forsk. Fl Egypt. (1775) p. 81. *Capparis decidua* Pax, in Engl. & Prantl, Pflanzenf. v.3, part 2, pp.230, 231, fig. 139.

A straggling, glabrous; shrub; branches terete, smooth, green. Leaves on the young shoots only (the older branches leafless), small, less than 2 to 5 cm, long. linear oblong, acute, spinous-pointed petioles very short or 0 stipular thorns long, sharp, straight, orange-yellow. Flowers in many-flowered corymbs, from the old branches, or from short lateral shoot pedicels slender, long. Sepals the outer pubescent, glabrous, beaked. Nepti.

Fls. & Frts.: November-March

Local Name: Nepti, Nishpatraka, karir, kair, kirir, karril,

Locality: Sonamba forest

Threats: Some species of *Capparis* are becoming rare, mainly due to habitat destruction, and a few are seriously threatened with extinction

Ecology: They are found arid region and are highly useful in landscape gardening, aforestation and reforestation. They can stop soil erosion and preserve agricultural land.

Distribution: *Capparis* species occur over a wide range of habitat in the subtropical and tropical zones. Native to the Mediterranean basin.

Medicinal Uses: It is a very well known anti oxidant shrub, useful in diabetes, non healing wounds, parasitic worms, anorexia, asthma, cough, swelling etc The plant is traditionally used to cure toothache, arthritis, asthma, cough, inflammation, intermittent fevers, malaria, rheumatism, and swelling. It is also believed to possess laxative, astringent and vermifuge properties. The alcoholic extract of fruit pulp and root bark is claimed to have anthelmintic activity. The fruits and the seeds are used to cure cholera, dysentery and urinary purulent discharges and have diuretic and antidiabetic properties.(Vardhana,2008).

Field collection number: RVK 43

Cleome gynandra L., (Cleomaceae (Pax) Airy Shaw Sp.Pl.671.1753; Santapaui and Wagh in Bull.Bot.Surv.India 5(2): 106.1963.*C.pentaphylla* DC, Prodr.1:238.1824; Hook.*f.*,Fl.Brit. India1:171.1872 Cooke, Fl.Pres. Bombay 1:42. 1958(Repr.ed.).

Glandular pubescent, 30-70 cm tall annals. Stem striate, branched at base. Leaves 3-5-foliolate; lower petiolate; leaflets elliptic-obovate or elliptic- lanceolate. Flowers white, in terminal racemes. Siliquae 5-7 cm long, terete, striate. Seeds dark-brown, concentrically ridged and transversely crested.

Fls. &Frts.: July-December

Local Name: Ajagandha, Pandhri Tilwan

Locality: Chandwad ghat

Threats: Often gazing

Ecology: It is generally found growing in full sun or semishade in distributed area and around pan edges

Distribution: *Cleome gynandra* is a common plant occurring throughout the tropics and subtropics. It is found in agricultural land near human settlement. Native to Africa.

Medicinal Uses: Root is used as medicine for chest pain, leaves treat diarrhoea seed thrown water can kill fish, Leave boiled and give to mother before and after delivery were blood has been lost. Treatment with *Cleome gynandra* extract arrested elevation of glucose and lipid profiles**.** Administration of alloxan significantly increased the level of glucose when compared to control rats which might account for the cytotoxic effect on beta cells. Alloxan is relatively toxic

to insulin producing pancreatic beta cells. The juice of leaf is beneficial in otalgia (earache) and convulsion. (Kaushik and Dhiman, 2000).

Field collection number: RVK 166

Cleome monophylla Linn. (Cleomaceae (Pax) Airy Shaw Sp. Pl. (1753) p. 672. Fl. B. I. v. 1, p. 168 ; Grah. Cat. p. 7; Dalz. & Gibs. p. 8; Trim. Fl. Ceyl. v. 1, p. 55; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 122.

Erect, branched, 1-2 ft. high, more or less hairy or pubescent stems striate. Leaves simple, passing gradually into bracts above, oblong-lanceolate, base truncate, rounded or cordate petioles slender, Flowers pink solitary in the axils of stalked, leafy bracts, in a long erect raceme pedicels slender bracts ovate or subdeltoid, cordate, strongly pubescent. Stamens 6.Sepals linear, acute, ciliate with gland-tipped hairs. Petals oblong, rounded at top, clawed. Capsules, subcylindric, pointed, striate, clothed with short stout hairs. Gynophore very short or 0. Seeds transversely rugose.

Fls. & Frts.: February-August

Local Name: Bagra, Senegal

Locality: Mulher

Threats: Overgrazing

Ecology: It is found light fertile soil in a warm dry sunny red sandy loams and yellowish sandy sediments

Distribution: Throughout tropical, common in moist grasslands, deciduous woodland, bush lands, lake shores. Nativity Tropical Africa (Reddy *et al*; 2008)

Medicinal Uses: The seeds and leaves of the violet-flowered form of this plant are used, with or without those of *Gynandropsis pentaphylla*; to make the Ayurvedic drug called 'hurhur' in India. This drug is used on ulcers, boils and wounds and is said to prevent the formation of pus. The roots are chewed in the morning and evening as a treatment for cough. The whole plant is used externally as a treatment for swellings. The sap, expressed and added to water, is a common treatment of ear discharges. The leaf-sap is used as a sudorific in the treatment of fevers. The seeds are anthelmintic, rubefacient and vesicant. (Kaushik and Dhiman, 2000).

Field collection number:RVK175

Casearia graveolens Dalz. (Flacourtiaceae DC). in Hook.J.Bot.4:107.1882; C. B, Clark .in Hook.*f.*,Fl. Brit.India 2: 592. 1879;Cooke, Fl. Pres. Bombay 1:553. 1958(Repr.ed.).

Large shrubs or small trees, glabrous,1-5 m high stem and branches lenticellte. Leaves 4.0-12x 3.0-7.2cm, broadly elliptic, sub acuminate, obtuse or rounded at apex, crenate-serrate at margins. Flowers green, in axillary clusters on leafless branches sepals 0.1-0.2 cm long, deeply 5- lobed, oblong-obtuse. Fruits 1.5-2.5 cm long, greenish-yellow, ellipsoid, 3-valved; seeds ovoid-compressed, red aril.

Fls.& Frts.: April-September

Local Name: Kirmira, chilhaka

Locality: Kelzer, Dangsaundane

Threats: Due to woodcutting

Ecology: Found along forest roads

Distribution: Rare in hilly forest tracts. Native of India, s China, Bangladesh, Bhutan, Nepal.

Medicinal Uses: The leaf oil extracted from seed is used for diabetes, swelling, worm. Antidote for snakebite. (Kaushik and Dhiman, 2000).

Field collection number: RVK 20,423

Flacourtia indica Burm.*f.* (Flacourtiaceae DC). Merr. Interp. Amb. 377. 1917. *F. latifolia* T. Cooke, Fl. Pres. Bombay 1:59. 1958 (Repr. Ed.).

Small thorny trees or shrub. Bark light-blackish-brown, rough, lenticellte. Leaves 2-10 x 1-6.8 cm, coriaceous, ovate-elliptic or oblong, serrate or crenate, glabrous, petiolate. Flowers greenish-yellow, fascicled in axils or on leaflets branches. Berries glabrous, globose, deep red or deep purple. Seeds obovoid, trigonous, pale-yellowish-brown, pubescent.

Fls. & Frts.: January-May

Local Name: Henkel-payar, kati-bor, Kaker, Bhekal

Locality: Saler

Threats: Woodcutting by Habitat loss

Ecology: Found in forest fringes

Distribution: Rare. However, it is uniquely Indian, originating in North and East Bengal, and Chittagong

Medicinal Uses: Whole plant is used as antibacterial, antioxidant, antimalarial, hepatoprotective, anti-diabetic, ant-athmatic.Root bark is used for hebal medicine for treatment of snakebite, the bark is belived to be effective for arthrise, and most part of the plant are used

for cough, pneumonia and bacterial throat infection and used in diarrhea. Gum is given with other ingredient for cholera fruit is used as enlargement of spleen and in jaundice.(Vardhana,2008).

Field collection number:RVK442

Flacourtia montana Grah. (Flacourtiaceae DC). Cat. Bomb. pl (1839) .10. F1 B.Iv.1.p. 192; Dalz & Gibs p.10; Talb Trees, Bomb p. 12 Woodr in Journ. Bomb. Nat.v.11 (1897) p. 124; Watt. Dict. Econ. Prod. v. 3, p. 398.

A very thorny tree. Leaves 3-5 nerved from the base, ovate, acute or acuminate crenate, glabrous and shining above, glabrate beneath except the midrib, base acute or rounded; petioles long. Flowers dioecious fascicled densely pubescent racemes. Fruit globose, obtusely ribbed size of a cherry, of an agreeable acid flavor, scarlet when ripe, edible.

Fls. & Frts.: November-December

Local Name: Gajale, Hennu sampige, Nayibela, Indian plum

Locality: Igatpuri

Threats: Habitat loss. Due to woodcutting.

Ecology: Growes in evergreen to semi-evergreen forests up to 900 m

Distribution: Endemic to the Western Ghats common trees in Maharashtra Sahyadri

Medicinal Uses: Fruits are pleasantly acrid, eaten raw or made into jelly. According to a review completed by Gopi Chand Kota at Prist University, the poor in rural India grind *Flacourtia* seeds with powder and turmeric. This concoction is administered to women post child delivery. In traditional medicine, *Flacourtia* acts as an appetite stimulant, diuretic, and digestive, and also combats enlarged spleen and treats jaundice. *Flacourtia* roots are used as a refrigerant, alexipharmic, and depurative. In Ayurveda, the roots remedy conditions of pitta and vata. (Vardhana, 2008).

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19. The Checklist of Blue Green Algae Potential from Akkalpada Dam of Dhule [Maharashtra]

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Abstract

The Present survey with relation to potential of blue green algae ofCyanophyceaeclass carried out for Akkalpada Dam of Dhule district. The survey consist Blue green alage flora of different stations of Dam. It shows 15 genera and 34 species belonging to class. Cyanophyceae. The morphological types observed are trichomaceous, filamentous, falsely branched etc. Genera Osciallatoria, Aphanocapsa and Merismopedia were encountered by maximum number of species.

Keywords : Algae, B.G.A., Potential, Cyanophyceae

Introduction

Taxonomic study of blue green algae from Akkalpada Dam is need to emphasizes mainly the relationship between algae and environment with respect to algal growth. The algae widely spread in aquatic environment and water plays an important role in their growth. Studies on Blue green algae of Dams of North Maharashtra region has been very much restricted with certain reports as, Ahmed and Krishnamurthry (1990) worked on hydrobiological studies of Wohar reservoir of Aurangabad (Maharashtra). More (1997) has made limnological observations of Panzara Dam and river with relation to algae. Pendase et.al. (2000) carried out hydrobiological study of percolation tank of village Dasane of Nashikdistrict. Nandan and Mahajan (2002) made observation of periphyton in Hartala lake of Jalgaon district (Maharashtra). Nandan and Jain (2002) studied algae from Sonvad Dam of Dhule. They found population of Blue green and Green algae were greater than Distoms and Euglenoids. Aher (2003) did limnological studies on Haranbari dam and Mosamriver with reference to algae. He reported 161 algal taxa from Dam site and 198 taxa from river site. Jayabhaye et.al. (2007) did the study of phytoplankton diversity of Parola Dam, Hingoli. Wagh (2009) did the study of phycodiversity and water quality

assessment of water reservoirs from Ahmadnagar district of Maharashtra state. Patil (2013) did limnology and biodiversity studies of algal flora of Sulwade Barrage of Dhule District. So it is important to study the Cyanophyceae potential from Akkalpada Dam of Dhule.

Material and Methods

Present study area situated in western khandesh in Dhule district of North Maharashtra. Geographically it lies between 25°56'28" North Latitude and 74°27'22" East longitude. Algal samples were collected from study area at monthly interval for two years Algal samples were collect in plastic bottles containing 4% formalin for further investigation. Algal analysis made by qualitative analysis. With the help of standard monographs and related literatures algae were indentified.

Result and Discussion

In present investigation 15 genera and 34 species are recorded. The maximum population of Blue green algae was observed in July than April. There is seasonal change occurs in population of Blue green algae Blue green algae are never in abundance. In present study Osciallatoria, Aphanocapsa, Merismopeida, Microcystis and Chroococcus are dominant as compare to other. Maximum composition of blue green algae was reported during mansoon period. Blue green algae represent with following potential as,

01. Microcystisviridis (A.Br.) Lemm.
02. MicroystisaeuruginosaKuetz.
03. MicrocystisprotocysitsCrow.
04. ChroococcusmontanusHansgira.
05. ChroococcusminatusKuetz.
06. Chroococcusminor (Kuetz) Nag.
07. Aphanocapsabiformis A.Br.
08. AphanocapsamontageCramer.
09. AphanocapsaLittoralisHansgira.
10. Aphanocapsapulchera (Kuetz.) Rab.
11. Gloeocapsacalcare Tilden.
12. SynechococusaqualisSau.
13. Merismopediatenuissmialemm.
14. Merismopediaqlauce (Ehrenb) Nag.

15. MerismopediapunctataMeyen.
16. MerismopediatenussimaLemm.
17. MyxosarcinaspectabilisGeitler.
18. Myxosarcianburmensiskuja.
19. OscillatoriaFormosa Borg ex. Gomont.
20. OscillatoriaaccuminataGomont.
21. Oscillatoriaomphibia Ag. ex. Gomont.
22. OscillatoriachilkensisBiswas.
23. Oscillatoriaanimalis Ag. ex. Gomont.
24. OsscillatoriaLimosa Ag. ex. Gomont.
25. Lyngbyaceylanicawille.
26. Lyngbyapalmarum (Mortens) Breb.
27. LyngbymajorMenegh ex. Gomont.
28. Lyngbyamajuscula Harvey ex. Gomont.
29. Scytonematopsiskashyapi (Bhardwaja) Geilter.
30. Scytonemamontane ex. Born et. Flah.
31. Chlorococcusgiganteus West. W.
32. Chlorococcusminor (Kuetz.) Naegeli
33. Stigonemaminatum (Ag.) Hassell
34. Hapalosiphonwelwitschii w.et. G.S. West

Significance

The Following significance can provide by present study

1. Such taxonomical study of B.G.A. is basically useful to taxonomist. ecologist and researchers of algae for obtaining information
2. As the water used for agriculture purpose, different typs of cyanobecteria are helpful as biofertilizer to agriculture field and this type of information will also helpful to farmers
3. Survey of blue green algae of potential is the first step in the efforts on comprehensive taxonomic survey.

This paper deals with the general account on the taxonomy and morphology of B.G.A. from Akkalpada Dam of Dhule (M.S.)

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20. The Role of Library in Modern Information Society

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Abstract

The present society is increasingly more focused and centered on information handling, processing and dissemination using various technologies. In this society information is key resource and plays an important role in all activities of the society. Libraries are playing a vital role in the development of knowledge full society through its collections, resources and services. Libraries are becoming society oriented knowledge center. In the complex modern society libraries have many kinds of answers to many demands of the society. Libraries have potential means to serve both the information society development and their traditional humanistic tasks.

Key words: Information, society, education, library, services, technology, etc.

Introduction

The human society has so far witnessed three major revolutions that are agricultural revolution, industrial revolution and technological revolution. These three revolutions brought tremendous changes. Today we are at another revolution 'Information revolution'. William J. Martin defined information society as, "A society in which the qualities of life, as well as prospects for social changes and economic development, depend increasingly on information and its exploitation. In such a society, living standards, patterns of work and leisure, the education system and the market place are all influenced markedly by advances in information and knowledge. This is evidenced by an increasing array of information intensive products and services, communicated through a wide range of media, many of them are electronic in nature."

The present society is increasingly more focused and centered on information handling, processing and dissemination using various technologies. In this society information is key resource and plays an important role in all activities of the society.

Library and information society are inter linked and dependent with each other. Libraries are playing a vital role in the development of knowledge full society through its collections, resources and services. In the era of technology of the 21st century has brought changes in the libraries. In the modern society libraries have a new role and various models of library, these are

i) Memory Institution as a Traditional Library
ii) Learning and research centre as Academic and Special Library
iii) Cultural and communication centre as a Public Library
iv) Electronic, Virtual and Digital Library

In the various models of library, the libraries main role is to mediate between existing and accessible information resource to users. In the recent years number of changes have take place in the libraries that includes,

i) Changes in organizational structure
ii) Financial resources
iii) Increase the electronic resources
iv) Expand of web-based services
v) Complication of information environment

The advantages of information infrastructure and offering web-based electronic services create new conditions and possibilities for libraries that substantially differ from traditional library model. The implementation of new information and communication technology in the library work has widened the provision of library services.

The role of libraries in modern information society

Libraries are becoming society oriented knowledge center. To serve a vehicle of progress of society library plays a vital role:

i) To access, organize, preserve and service all expressed thought as books, journals and other resources produced as a means for communication.
ii) To help the transmission of knowledge to next generation.
iii) To help in research activities.
iv) To help building up of knowledge from generation to generation.
v) To provide new ICT based services.
vi) To help new in self education to one and all.

Conclusion

The challenge to modern information societies is that the basic resources, knowledge, is developing from information in very individual, whimsical and unpredictable process. Still, societies can support this development; libraries are organizing information and offering access. In the complex modern society libraries have many kinds of answers to many demands of the society. Libraries have potential means to serve both the information society development and their traditional humanistic tasks. Libraries are particularly important now when the whole idea of education is emphasizing more and more independent learning and acting. In the modern information society, where the use of electronic services and Web-based information sources are constantly increases. Libraries and librarians are responsible for collection development and promotion of services, modernization of library and making information resources accessible to the modern society. Libraries are playing an important role to provide right information, to right user, at right time at right place.

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21. A Study of Economic Analysis of Climate Change

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Abstract

The present study is an attempt to analyze the impact of climate change on economy. The present work is based on various reports published by government panel and private research agencies. Putting climate change in the framework of economic analysis, we have consider greenhouse gas emissions, which cause planetary warming and other changes in weather patterns, as both a cause of environmental externalities.

Key Words: Economic analysis, Climate Change.

Introduction

Scientists have been aware since the 19^{th} century of the planetary impacts of carbon dioxide (CO_2) and other greenhouse gases in the atmosphere. In recent decades, concern has grown over the issue of global climate change caused by increased accumulations of these gases. The problem often referred to as global warming is more accurately called global climate change. A basic warming effect will produce complex effects on climate patterns with warming in some areas, cooling in others, a Putting climate change in the framework of economic analysis, we can consider greenhouse gas emissions, which cause planetary warming and other changes in weather patterns, as both a cause of environmental externalities and a case of the overuse of a common property resource.

The atmosphere is a global commons into which individuals and firms can release pollution. Global pollution creates a "public bad" affecting everyone—a negative externality with a wide impact. Many countries have environmental protection laws limiting the release of local and regional air pollutants**.** In economic terminology, such laws to some degree internalize externalities associated with local and regional pollutants. But until relatively recently, few controls existed for carbon dioxide (CO_2), the major greenhouse gas, and concentrations of CO_2 in the atmosphere have risen steadily, recently crossing the benchmark of 400 parts per million

(ppm) atmospheric concentration and increased climatic variability and extreme weather events. Impacts of climate change have already begun to affect climate patterns.

Objectives

The main objectives of the present work are following:

i. To study economic analysis of climate change.

ii. To analyze impact of climate change on economy.

Database and Methodology

The present paper intends to analyze the economic analysis of climate change entirely based on secondary sources of data collected from various national and international level agencies and panel reports of global warming and climate change.

Trends of Global Climate

The earth has warmed significantly since reliable weather records began to be kept in the mid-nineteenth century. In the past 100 years, the global average temperature has risen about 1°C, or about 1.8°F. Fourteen of the fifteen warmest years in the modern meteorological record have occurred from 2000 to 2015. The record of 2014 as the hottest year ever recorded was broken by the year 2015, which in turn was broken by 2016, which was about 1.1°C above preindustrial levels. Evidence indicates that the rate of warming, currently about 0.13°C per decade, is increasing. The US Department of Energy's Pacific Northwest National Laboratory estimates that the rate at which temperatures are rising could be 0.25°C per decade by 2020.

Not all areas are warming equally. The Arctic and Antarctica have been warming at about double the global rate. Melting ice in the Arctic is both a result of global warming and a cause of further warming, since Open Ocean absorbs more of the sun's energy than ice, a phenomenon known as reduced albedo. Warmer temperatures have produced noticeable effects on ecosystems.

Climate change is also leading to rising sea levels. Sea-level rise is attributed to the melting of glaciers and ice sheets and to the fact that water expands when it is heated. In 2012, the global average ocean temperature was about 0.5°C above the 20^{th} century average. The combination of warmer oceans and melting ice has led sea levels to rise about 2 millimeters per year, and in 2012 the sea level was already 9 inches (23 cm) above the level of 1880. The impact of rising seas threatens numerous coastal areas. In addition to Rising Ocean temperatures, increased CO_2 in the atmosphere results in ocean acidification.

Economic Analysis of Climate Change

Scientists have modeled the results of a projected doubling of accumulated CO_2 in the earth's atmosphere. Some of the many negative predicted effects are:

- Loss of land area, including beaches and wetlands, because of sea-level rise.
- Loss of species and forest area.
- Disruption of water supplies to cities and agriculture.
- Increased air conditioning costs.
- Health damage and deaths from heat waves and spread of tropical diseases.
- Loss of agricultural output due to drought.

Some beneficial outcomes might include:

- Increased agricultural production in cold climates.
- Lower heating costs.
- Fewer deaths from exposure to cold.

The potentially beneficial outcomes would be experienced primarily in northern parts of the Northern hemisphere. Most of the rest of the world, especially tropical and semi-tropical areas, are likely to experience strongly negative effects from additional warming. According to IPCC projections, with increasing emissions and higher temperatures, negative effects will intensify and positive effects diminish. Other less-predictable but possibly more damaging and permanent effects include:

- Disruption of weather patterns, with increased frequency of hurricanes, droughts, and other extreme weather events.
- A possible rapid collapse of the Greenland and West Antarctic Ice Sheets,
- which would raise sea levels by 12 meters or more, drowning major coastal cities
- Sudden major climate changes, such as a shift in the Atlantic Gulf Stream, which could change the climate of Europe to that of Alaska.
- Positive feedback effects, such as an increased release of CO_2 from warming arctic tundra, which would speed up global warming.

There is considerable uncertainty about the expected global warming in the coming century. We need to keep such uncertainties in mind as we try to evaluate economic impacts of global climate change. Given these uncertainties, some economists have attempted to place the

analysis of global climate change in the context of cost-benefit analysis. We will first examine economists' efforts to capture the impacts of global climate change through cost-benefit analysis.

Cost-Benefit Studies of Global Climate Change

Without policy intervention, carbon emissions in a business-as-usual scenario would be expected to continue to rise. When economists perform a cost-benefit analysis, they weigh the consequences of the projected increase in carbon emissions versus the costs of current policy actions to stabilize or even reduce CO_2 emissions. Strong policy action to prevent climate change will bring benefits equal to the value of damages that are avoided. These benefits of preventing damage can also be referred to as avoided costs. The estimated benefits must then be compared to the costs of taking action. Higher ranges of temperature change lead to dramatically increased damage estimates at the global level. Different models yield different estimates for future damages and in turn different impacts on the economy, ranging from 2% to 10% or more of global GDP per year, depending on the global mean temperature rise. The IPPC estimates of likely temperature change by 2100.

Findings and Conclusion

Climate change is an issue that embodies issues of externalities, common property resources, public goods, renewable and nonrenewable resources, and the discounting of costs and benefits over time. It has economic, scientific, political, and technological dimensions. Economic analysis alone cannot adequately respond to a problem of this scope, but economic theory and policy have much to offer in the search for solutions.

An effective response to the climate change problem requires much more sweeping action on a global scale than anything so far achieved. Economic policy instruments that have the power to alter patterns of energy use, industrial development, and income distribution are essential to any plan for mitigating or adapting to climate change. Evidence of climate change impacts is already clear, and the issue will become more pressing as greenhouse gas accumulation continues and costs of damages and of climate adaptation rise.

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