ISSN 2277 - 5730

AN INTERNATIONAL MULTIDISCIPLINARY
QUARTERLY RESEARCH JOURNAL

AJANTA

Volume - VIII Issue - I English Part - II January - March - 2019

Peer Reviewed Referred and UGC Listed Journal

Journal No. 40776

ज्ञान-विज्ञान विमुक्तये

IMPACT FACTOR / INDEXING
2018 - 5.5
www.sjifactor.com

❖ EDITOR ❖
Asst. Prof. Vinay Shankarrao Hatole
M.Sc (Maths), M.B.A. (Mktg.), M.B.A. (H.R.),
M.Drama (Acting), M.Drama (Prod. & Dir.), M.Ed.

❖ PUBLISHED BY ❖

Ajanta Prakashan
Aurangabad. (M.S.)

Printed by

Ajanta Computer, Near University Gate, Jaisingpura, Aurangabad. (M.S.)

Published by :

Ajanta Prakashan, Near University Gate, Jaisingpura, Aurangabad. (M.S.)

Cell No. : 9579260877, 9822620877, Ph.No. : (0240) 2400877

E-mail : ajanta1977@gmail.com, www.ajantaprakashan.com

AJANTA - ISSN 2277 - 5730 - Impact Factor - 5.5 (www.sjifactor.com)

EDITORIAL BOARD

EDITORIAL BOARD

PUBLISHED BY

Ajanta Prakashan
Aurangabad. (M.S.)

CONTENTS OF ENGLISH PART - II

CONTENTS OF ENGLISH PART - II

CONTENTS OF ENGLISH PART - II

1. Algal Growths in Domestic Water Reservoirs from Dhule City (M.S.)

Archana M. Chaudhari
P. G. Department of Botany, S. S. V. P. Sanstha's L. K. Dr. P. R. Ghogrey Science College, Dhule (M.S. India)

Abstract

An algal growth in domestic water reservoirs is usual problem. Algal spores and micro fragments escaped from city water filtration system may develop into water reservoirs. Many algal taxa were reported from domestic house hold water tanks in Dhule city. Members of Cyanophyceae, Chlorophyceae and Bacillariophyceae were noticed to occur in reservoirs. Sunlight and stagnancy of water triggers the algal growths. Regular sanitation of water tanks is demanded to keep water free from algal growths.

Key words: Algal growths, Domestic water reservoirs.

Introduction

Algae are microscopic plants. They constitute phytoplankton community in water bodies. Spores and fragments of algae develop readily in domestic water tanks if sanitation is not followed regularly. Daily Municipal water supply is not possible for Dhule city, it is done after 3 or 4 days due to water shortage. Every house in Dhule city for the reason, must have to maintain a big cement reservoir for water storage either overhead tanks or small house hold tanks. Presence of algal taxa was noticed in such tanks.

Material and Methods

Water samples were collected from various domestic water reservoirs from Dhule city. House hold tanks, corporation tanks, overhead tanks of many apartments were screened monthly for algal growths throughout the year 2016-17. Water samples were taken from tanks as well as algal growths observed on edges of tanks were scrapped and collected in sample bottles. The microscopic observations of preserved algal taxa were done under calibrated microscope. The taxa were identified with standard monograph of Desikachary(1959),Philipose(1967) ,Sarode Kamat (1984) and relevant literature.

Observations

List of recorded taxa is as follows-

1] ***Chroococcus minutus*** (Kuetz.) Nag., **2]*Microcystis stagnalis*** Lemn.

3] ***Merismopedia aeruginea*** Breb., **4]** ***Oscillatoria subtilissima*** Kuetz.

5] ***Fragilaria intermedia*** Grun. , **6]** ***Synedra ulna*** (Nitz.) Ehr.V.***subaequalis*** Gran.

7] ***Synedra acus*** Kuetz. , **8]** ***Cymbella aspera*** Ehr.cleve.

9] ***Navicula cuspidata*** Kuetz. , **10]** ***Navicula pupula*** Kuetz.

11] ***Pinnularia dolosa*** Gandhi , **12]** ***Closterium parvulum***Nag.

13] ***Euastrum sinuosum***Var. ***ceylanicum*** W&West. , **14]** ***Euastrum erosum*** Lund.

15] ***Cosmarium pseudopyramidatum*** Var.***oculatum***. , **16]** ***Cosmarium binum*** Nordst.

17] ***Staurastrum pseudopachyrhynchum*** Wolle.

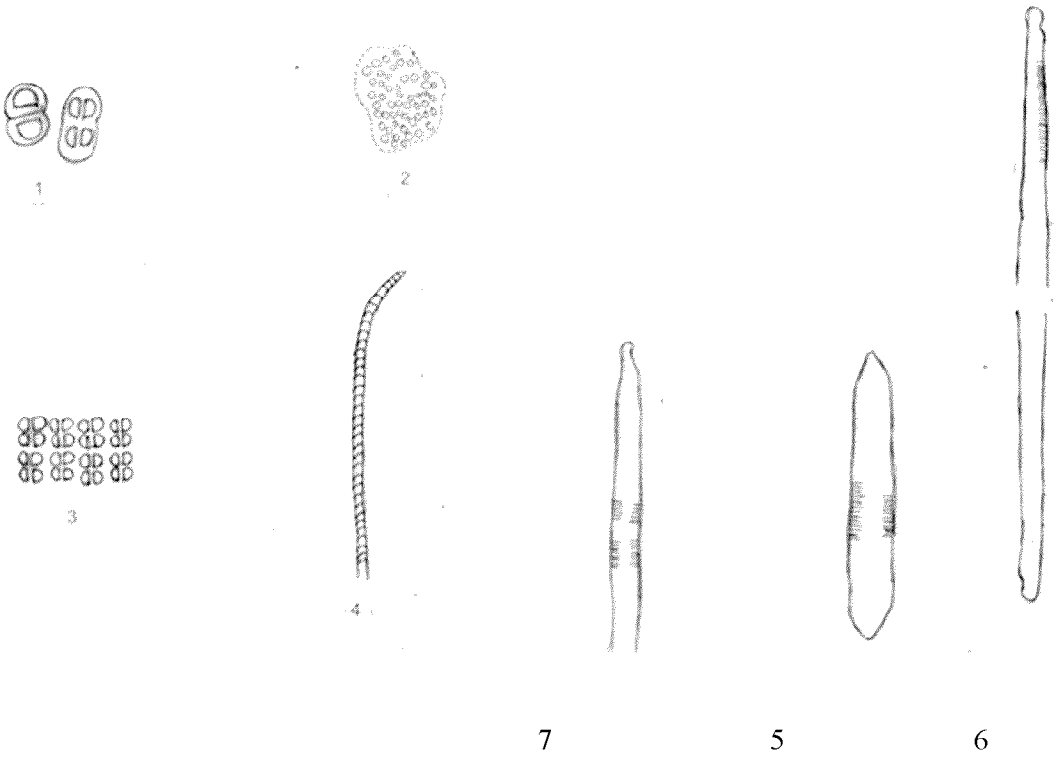
Result and Discussion

In present survey, total 17 algal taxa were recorded from domestic water reservoirs in year 2016-2017. It is observed that sunlight, stagnancy and available surface area triggers algal growth in these tanks. Cyanophyceae members represented by 4 taxa like *Chroococcus, Microcystis, Merismopedia* and *Oscillatoria*. Bacillariophyceae members represented by 7 taxa like *Fragilaria,* two species of *Synedra,* two species of *Navicula, Cymbella* and *Pinnularia.* Chlorophyceae members represented by 6 taxa like *Closterium,* two species of *Euastrum* , two species of *Cosmarium* and *Staurastrum.*

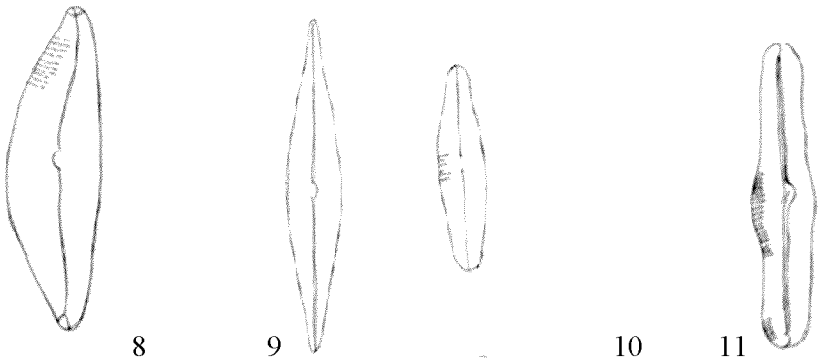
Olive Green and yellow colored loose patches mostly observed on edges of water reservoirs which can be easily get disturbed by little agitation. Desmids occurred in sunny conditions. Domestic tanks if not regularly cleaned, spores,fragment and hormogones rejuvenate in tank water exhibiting algal growts.

Acknowledgement

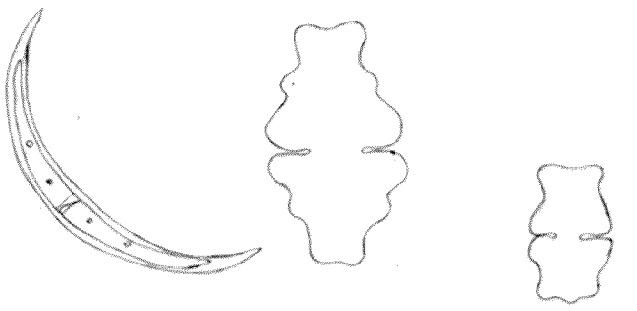
Author wish to express sincere gratitude to P.G.Department of Botany, S.S. V.P. S.L. K. Dr.P. R. Ghogrey Science College, Dhule, for providing necessary facilities.



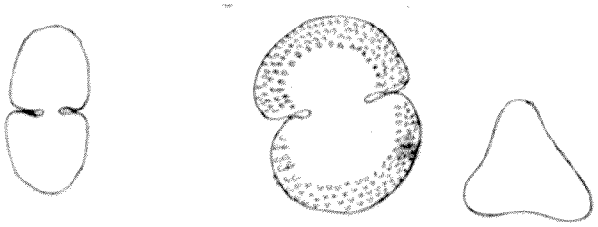
7 5 6



8 9 10 11



12 13 14



15 16 17

References

1. Desikachary T.V.1959 Cyanophyta *ICAR* New Delhi
2. Farida M.S.E. El Dars,M.A.M. Abdel Rahman,Olfat, M.A.Salen,El.SayedA.AbdelAal 2015 Algal control and enhanced removal in drinking water in Cairo,Egypt,A case study,*Environmental Sci.*10(8):295-307
3. Palmer C.M. 1958 Algae and interference organisms in water supplies of California.*J.A.Water Wks.assoc*.52,897-914
4. Palmer C.M. 1959 Algae in water supplies,an illustrated manual on the identification,significance,and control of algae in water supplies *Pub.HealthServ.Publ.*No.657, 88.
5. Palmer C.M. 1962 Algae in water supplies of Ohio.*OhioJ.Sci.* 62,225-244
6. Philipose M.T. 1967 Chlorococcales*ICAR* New Delhi
7. Sarode P.T.and Kamat N.D. 1984 Fresh water Diatom from Maharashtra, *Saikrupa Prakashan*, Aurangabad.

2. Ecocriticism: Way to Environmental Awareness

Mr. M. B. Baviskar
Head, Dept of English, Kisan Arts, Com. & Sci. College Parola, Dist- Jalgaon. (M.S.)

Abstract

Ecocriticism has acquired a great deal of importance in the later part of twentieth century. The global environmental movement has started its development strategies to preserve nature and environment. The present concerns to save environment and nature are limited. Therefore, a holistic approach is expected to look into the matter. Ecocriticism investigates the global ecological crisis through the intersection of literature, culture and the physical environment. It is unique in contemporary literature and cultural theories. It is the study of the relationship between nature and man and explores the relationships between literature and the environment. Nature plays an important role in Man's life. It influences human life. Human life too influences literature and art. Ecocriticism relates to the relationship with the environment and Nature. Environment impacts people's day today lives. Ecocriticism has become a coherent discipline within literary studies in the last decade of twentieth century. The present paper attempts to focus on an ecological consciousness the need to emphasize both modern and traditional knowledge.

Key Words: Ecocriticism, Nature, Ecology and Environment.

Introduction

Cheryl Glotfelty defined that, "Ecocriticism is the study of the relationship between literature and physical environment."(The Ecocriticism Reader P.xviii)[1] It takes an earth centred approach to literary studies. From an interdisciplinary point of view all science come together to analyze the environment. It gives possible solution for the correction of the contemporary environmental situation. Ecocriticism was officially heralded by the publication of two seminal works, both published in the mid- 1990s the ecocriticism reader, edited by Lawrence Bluell. In the United States, Ecocriticism is often associated with the association and for the study of literature and environment matters in Literature. ASLE has official journal interdisciplinary studies in Literature and Environment. It is concerned with most of the current American scholarship in the rapidly evolving field of ecocriticism. Ecocriticism is an intentionally broad approach that known by a number of other designations, including green studies. (Cultures).

Challenges and Awareness

Ecocriticism investigates the underlying ecological values, what precisely, is meant by the word nature. Ecocritics examine human perception of wilderness and how it has changed through history and whether or not current environmental issues are accurately represented or even mentioned in popular culture and modern literature. Other disciplines such as, history, philosophy, ethics and psychology. Harold Fromm argues that ecocriticism is rooted in the past: Like Moliere's M. Jourdain speaking prose without knowing it, classic writers were unwittingly doing ecocriticism for centuries before the genre burst forth onto the academic scene in the early 1990s. From Virgil's Georgics to John Clare to Thoreau to Rachel Carson, sensitive people had actually noticed that they were living on and from the primal mud of Earth. William Ruccket may have been the first person to use the term ecocriticism. Ruccket published an essay titled literature and Eucology: An Experiment in Ecocriticism. His intend was to focus on the application of Ecology and Eucological concepts to the Study of Literature. Ecocriticism, as it now exists in the USA, takes its literary bearings from three major nineteenth-century American writers whose works celebrate nature, the life force and the wilderness as manifested in America. Ralph Waldo Emerson. Margaret Fuller and Henry David Thoreau. All three were known collectively as the transcendentalists, the first literary movement in America to achieve cultural independence from European models. Emerson's first short book Nature, published anonymously in 1836. It is a reflective essay on the impact upon him of the natural world. He often voiced in words of powerfully dramatic directness. Crossing a bare common, in snow puddles, at twilight, under a clouded sky, without having in my thoughts any occurrence of special good fortune. Fuller's first book was summer on the Lakes, During 1843, presents the glory of American landscape at large, as the first woman student at Harwad, at Niagara. She depicts:

> "For here there is no escape from the weight of perpetual creation.
> All other forms and motions come and go, the tide rises and recedes.
> The wind, at its mightiest, moves in gusts, but here is really
> an incessant, an indefatigable motion. Awake or Sleep, there is no
> escape, still this rushing round you and through you and thrown you.
> It is in this way I have most felt the grandeur- somewhat eternal,
> if not infinite." (p.71)

Thoreau has attracted towards the beauty of nature in form of Green Literature. Like William Wordsworth's motto-'a return to nature'. He lived in the company of nature for two years in a hut to understand nature's beauty. He takes its bearings from the British Romanticism of the 1790s. Harold Fromm argues that ecocriticism is rooted in the past: Like Moliere's M. Jourdain speaking prose without knowing it, classic writers were unwittingly doing ecocriticism for centuries before the genre burst forth onto the academic scene in the early 1990s. From Virgil's Georgics to John Clare to Thoreau to Rachel Carson, sensitive people had actually noticed that they were living on and from the primal mud of Earth. (Harold Fromm, Review Essay)[2] British ecocritics are also concerned with the event in Raymond William's book, The Country and the City (1973). The infrastructure of ecocriticism in the UK is less developed than in the USA. These two distinct varients of the ecological study suggests a similar situation. It is said that British Cultural materialism and American new historicism are clearly connected with their aims. Both the tendencies of USA and UK are sailing in the same boat of green literature. They have got Green Revolution to attract the readers to turn towards Nature. They give a warning to this modern world to the environment. We also protect nature in this world of commercial and industrial revolution. Ecocritics and theorists expect the nature in sonnet, ecological wisdom in the play. In what way the metaphors relate to landscapes. They hope that nature should be protected through literature.

According to Donald Worster:We are facing a global crisis today, not because of how ecosystems function, but rather because of how our ethical systems function. To overcome that crisis, we need to understand those ethical systems and use that understanding to reform them."(Worster p.27)[3] Ecocriticism takes as its subjects the interconnection between nature and culture. Ecologically minded scholars have published progressive works about ecology and criticism. In the past, there was no such moment to study the nature as the part of human being, human ecology. We must remember William Wordsworth's message 'return to nature'. If we agree with Barry Commoner's first law of ecology "Everything is connected to everything else".

Conclusion

Literature doesn't float above the material world. It plays an immense global role in which energy, matter, and ideas interact. The ongoing concern of man regarding environment is inappropriate. Ecocriticism suggests that nature and man should go hand in hand. As the men

and women of literature, we ought to preserve nature through culture and literature. It is the time to understand the significance of nature otherwise it would be difficult to breathe freely.

Works Cited

1. Glotfelty, Cheryll, and Harold Fromm. The Ecocriticism Reader: Landmarks in Literary Ecology. Athens, Georgia: The University of Georgia Press, 1996.
2. Fromm, Harold. The Nature of Being Human: From Environmentalism to Consciousness. Baltimore: The Johns Hopkins University Press, 2009.
3. Worster, Donald. The Wealth of Nature: Environmental History and the Ecological Imagination. New York: Oxford University Press, 1993.

3. Fodder Resources Sold in Dhule Tehsil of Khandes Region

D. A. Dhale
PG - Department of Botany, SSVPS's, L.K.Dr.P.R.Ghogrey Science College, Dhule. (Maharashtra) India.

Abstract

In India, in ancient times the knowledge about natural plants and animals life was an integral part of a person's learning. It is estimated that nearly 50,000 flowering plants all over the world are edible. The present researchers studied ethnobotany with particular emphasis on fodder resources for the domestic animal in Dhule tehshil. Some common places where these species are sold were visited regularly for knowing fodder resources and enquiry with reference to local name, status, domestic animal fed, and sellers name. Apart from these the information about habitat category and their prices were also enquired. The information has been adduced for total 20 species belonging to 20 genera and 13 families. Of these, shrubs and trees are widely used as fodder source. It has noteworthy that out of 20 species, 10 species are gathered from wild flora in the tehshil. These fodder sources are usefully fed for domestic animals such as goat, cow, ox, buffalo and rarely for rabbits. This fact indicates the necessary resources in the region. These taxa plays major role in sustaining live stock.

Keywords: Dhule, Ethnobotany, Fodder, Live stock.

Introduction

Plants are the oldest associated of man from very ancient times. During the nomadic period of mankind the food needs of man was met directly from the nature, mainly from forests. Throughout history, wild edible plants have sustained human populations in each of the inhabited continents, and the importance of plants to the living world hardly needs any elaboration. In India, in ancient times the knowledge about natural plants and animals life was an integral part of a person's learning. It is estimated that nearly 50,000 flowering plants all over the world are edible, whereas the number of plants utilized by the man for food hardly exceeds 30 (Swaminathan, 1993; Khoshoo, 1995).

Dhule, also known popularly as 'Dhulia' is one of the thirty districts of Maharashtra, situated at the North-western border of the state. It is a part of formerly called 'Khandesh'. Khandesh was divided in 1906 into two Districts, viz. 'West khandesh' and 'East khandesh'. Dhule District stretches between the meridians of longitudes 73047I and 75011I East and between the parallels of latitudes 20038I and 2203I North.

Major livelihood in the district is farming. Shifting cultivation is still in practice in the hilly parts of the district where major crops in cultivation are rice, maize, millets, pulses with varieties of vegetables and fruits. Followed below separately by relative abundance, flowering and fruiting period, local name/s and uses at the last.

The climate of Dhule district is markedly periodic. It is characterized by dryness on the whole expect monsoon which begins in June and lasts till about September. The entire year is divisible into four seasons. The cold winter season from December to February is followed by the hot summer season from March to May. The south-west monsoon which follows there after lasts till September. October and November constitute the Post-monsoon season.

The forests of Dhule district are tropical, dry deciduous type where in the Teak (Tecona grandis L.) is the Predominant species. The vegetation varies with the changes in altitude, aspect and rainfall.

Material and Methods

Extensive and intensive ethanobotanical surveys were carried out since June 2017 to March 2018. Every nook and corner Namely- 80 feet road, Ekveera devi, Sakari road market are visited in different seasons. Repeated attempts helped to authenticate the data collected. The plant specimens were deciphered using district floras (Patil, 2003; Kshirsagar and Patil, 2008) and regional flora (Cook, 1958). Plant specimens collected are deposited in the Herbarium Department of Botany S.S.V.P.S. L. K. Dr. P. R. Ghogrey Science College Dhule (M.S.), after following customary method of Herbarium preparation.

Results and Discssions

We extended ethnobotanical study in Dhule during year 2017-18 to tap down information on fodder resources useful for domestic animal and particularly sold in region. We could collect data on total 20 species belonging to 20 genera and 13 families of angiosperms. Of these, 15 species belong to dicotyledons under 15 genera and 12 families. Likewise 5 species belong to monocotyledons from 5 genera and a single family viz., Graminae (Poaceae). These taxa can be

cataguarised habit wise as: 06 (trees, 10 (shrubs), 01 (climber), and 3 (herbs). It there for appears that shrubby species are widely used as source of fodder. Tree also constitutes fair segments of source for the same. Climbers play a minor role after herbaceous taxa. Further we could collect information on status of the fodder species. Out of 20 species 10 species found under cultivation, where as remaining 10 species collected from wild source in region.

We also collected information on feeding of domestic animals as 6 (goat), 8 (cow), 5 (ox), 4 (buffalo) and 1 (rabbits). Utilization of local sources is mostly meant for goat, cows, oxes, buffalos and single species is feed for rabbits. The information on economic significance each fodder source is mention under enumerations. There various local names are also provided apart from the names of sellers whose livelihood largely depends on the sell of fodder species.

Table 1: General Observations of fodder in Dhule tehsil

Sr. No.	Botanical Name	Family	Wild/Cultivated	Dicot/Monocot	Habit	Season	Domestic Animal
1	*Cajanas cajan* (L.)Mill.	Papilionaceae	Cultivated	Dicot	Shrub	Rainy season	Goat
2	*Brassica nigra* L.	Brassicaceae	Cultivated	Dicot	Shrub	Winter season	Goat,cow
3	*Ficus racemosa* L.	Moraceae	Wild	Dicot	Tree	All season	Ox
4	*Amaranthus palmeri* Wats.	Amaranthaceae	Wild	Dicot	Shrub	All season	Cow
5	*Zea mays* L.	Graminae/Poaceae	Cultivated	Monocot	Shrub	All season	Cow, ox, baffelo
6	*Cordia dichotoma* Forst	Boraginaceae	Wild	Dicot	Tree	Summer	Goat,cow,ox
7	*Cynadon dactylon* (L.)Pers.	Poaceae	Wild	Monocot	Herb	All season	Goat, rabbit
8	*Gossipium herbaceum* L.	Malvaceae	Cultivated	Dicot	Shrub	Summer,Winter	Goat
9	*Mangifera indica* L.	Anacardiaceae	Cultivated	Dicot	Tree	All season	Cow
10	*Hardwickia binata* Roxb.	Caesalpinaceae	Wild	Dicot	Tree	All season	Ox
11	*Bauhinia*	Caesalpinaceae	Wild	Dicot	Tree	All season	Cow

	racemosa Lomk.						
12	*Cocculus pendulus* Diels.	Menispermaceae	Wild	Dicot	Herb	All season	Ox
13	*Tamarindus indica* L.	Caesalpinaceae	Cultivated	Dicot	Tree	All season	Goat
14	*Saccharum officinarum* Linn.	Graminae/Poaceae	Cultivated	Monocot	Shrub	Winter season	Ox,baffelo
15	*Sorghum bicolor*(L.) Moench	Graminae/Poaceae	Cultivated	Monocot	Shrub	Rainy season	Ox,Cow
16	*Abutilon pannasum* Schltdl.	Malvaceae	Cultivated	Dicot	Herb	Summer	Goat
17	*Arachis hypogeal* L.	Fabaceae	Cultivated	Dicot	Shrub	Summer,Rainy	Ox,Cow
18	*Euphorbia cyathophora* Murr.	Euphorbiaceae	Wild	Dicot	Shrub	All season	Goat
19	*Portulaca oleracea* L.	Portulacaceae	Wild	Dicot	Herb	All season	Goat
20	*Setaria intermedia* Roem & Schult.	Poaceae	Wild	Monocot	Shrub	All season	Goat

Table 2: Plant Species analysis of collected plants

Sr. No	Plant Species	Number of Sp.
1	Total Species	20
2	Total Genus	20
3	Total Families	13

Table 3: Taxonomic Analysis of Plant Species Collected

Sr. No	Plant Species	Number of Sp.
1	Total Dicot Species	15
2	Total Dicot Genus	15
3	Total Dicot Families	12
4	Total Monocot Species	05
5	Total Dicot Genus	05
6	Total Dicot Families	1

Table 4: Habit of Collected Plant Species

Sr. No	Plant Species	Number of Sp.
1	Total tree Species	06
2	Total shrub	10
3	Total climbers	01
4	Total herbs	03

Table 5: Cultivar/wild Status of Collected Plant Species

Sr. No	Plant Species	Number of Sp.
1	Total Cultivar Species	10
2	Total wild species	10

Table No.5: Feeding wise Plant Species

Sr. No	Plant Species	Number of Sp.
1	Goat	06
2	Cow	08
3	Ox	05
4	Buffalos	04
5	Rabbit	01

The above information pertains to the local utilities in Dhule tehshil. However these species are also employed for different purposes in the region and even outside it. This information amply clarified that those species are not important only for fodder purpose but also significant for medicinal and miscellaneous purpose.

The above information pertains to the local utilities in Dhule tehshil. However these species are also employed for different purposes in the region and even outside it. This information amply clarified that those species are not important only for fodder purpose but also significant for medicinal and miscellaneous purpose.

Summary

The present researchers studied ethnobotany with particular emphasis on fodder resources for the domestic animal in Dhule tehshil during the year 2017-18. Some common places where these species are sold were visited regularly for knowing fodder resources and enquiry with reference to local name, status (wilt/cultivar), domestic animal fed, and sellers name. Apart from these the information about habitat category and their prices were also enquired. The information

has been adduced for total 20 species belonging to 20 genera and 13 families. Of these, shrubs and trees are widely used as fodder source. It has noteworthy that out of 20 species, 10 species are gathered from wild flora in the tehshil. These fodder sources are usefully fed for domestic animals such as goat, cow, ox, buffalo and rarely for rabbits. This fact indicates the necessary resources in the region. These taxa plays major role in sustaining live stock.

References

1. Khoshoo, T.N. 1995. Census of India's biodiversity: tasks ahead, Curr. Sci. 69: 14-17
2. Swaminathan, M.S. 1993. Genetic diversity-safety net for smack farmer and food stock for biotechnologists. Paper presented to ISPGR Dialogue , New Dehli.
3. Patil D.A. 2003, Flora of Dhule and Nandurbar District, Bisen Singh Mahendral Pal Singh Publishers and distributors of Scientist Books 23-A, new Connaught place, P.O. Box 137, Dehra-dun 248001-INDIA
4. Khoshoo, T.N. 1995. Census of India's biodiversity: tasks ahead, Curr. Sci. 69: 14-17
5. Kshirsagar, S. R. and Patil, D. A.(2008), Forest flora of Jalgaon (Maharashtra). Bishen Singh Mahend Rapal Singh, Dehradun, India.
6. Swaminathan, M.S. 1993. Genetic diversity-safety net for smack farmer and food stock for biotechnologists. Paper presented to ISPGR Dialogue , New Dehli.
7. Patil D.A. 2003, Flora of Dhule and Nandurbar District, Bisen Singh Mahendral Pal Singh Publishers and distributors of Scientist Books 23-A, new Connaught place, P.O. Box 137, Dehra-dun 248001-INDIA
8. M.V.Patil and D.A.Patil, Journal of Non-timber forest products, vol 14(2) : 133-138, 2007 P.G. Department of Botany S.S.V.P.S's L.K.P.R. Ghogrey Sccience College, Dhule-424005 (Maharashtra)
9. Cooke, T : (1958). The flora of presidency of Bombay Val. 1-III, B.S.I. Calcutta (Repr. Ed.)

4. Studies on Algae from Nandur Madhmeshwar Dam, Niphad, Nashik

Andhale Shivaji B.
MVPS, S.V.K.T., Arts, Commerce & Science College, Deolali Camp, Dist. Nashik, Maharashtra
V. J. Medhane
MVPS, S.V.K.T., Arts, Commerce & Science College, Deolali Camp, Dist. Nashik, Maharashtra

Abstract

This dam is near village Nandur Madhmeshwar dam is 42 Km. from Nashik city. Nandur Madhmeshwar Bird Santuary is locates in Niphad Tehsil of Nashik district in Western Maharashtra. This was constructed in 1907-13 across the river Godavari just below the confluence of Kodwa and Godavari Rivers at Nandur Madhmeshwar. This resulted in the biological enriched conditions by which aquatic vegetation has been stabilized.

Nandur Madhmeshwar is nice place for migratory birds, because the area in reach food of phytoplankton and aquatic plant is available in dam.

Keyword: - Planktonic Algae Diversity, Nandur Madhmeshwar, Niphad, Nashik.

Introduction

A preliminary survey of algae of the water body was undertaken at sites of the dam during the years 2015-2016. It was noted that several planktonic algae were present in the water body. A large number of taxa of fresh water free floating algae have been recorded from sites of Nandur Madhmeshwar. *Pediastrum, Closterium,* are found to be dominant species at certain cites of the water body during winter.

The present investigation is the outcome of Biodiversity studies of free floating algae of area and enriches our knowledge of algal flora of this area. Therefore, the study of vegetation of the water body was undertaken during years 2015-2016.

Nandur Madhmeshwar dam-Built on the holy river- Godavari (1907-13). During the study, a large number of phytoplankton's like *Pediustrum, Closterium* were observed. The present paper describes 04 species of *Pediustrum,*10 species of *Closterium,* and its varieties, observed during present investigation. The water samples were collected once in a month in the morning between 8.00 a.m. to 10.00 a.m. The collections were made for 2 consecutive years

during 2015-2016, during the months of November to March. The morphological studies of specimens were done by using Olympus Research Microscope and the photographs were taken using Kodak EazyShare cx 7330 camera. Identification of taxa was done using Fritsch (1935), Patel and George (1977), Philipose (1967), Prescott (1951), Rath and Adhikari (2005) and other relevant literature.

Material and Method

The algal samples from each site were collected once in a month in the morning, between 8.00 a.m. to 10.00 a.m. The collections were made year 2015-016. The algal samples were collected in 100 ml capacity bottles and brought to the laboratory. They were preserved in 20 ml capacity bottles in 4 % formalin for further taxonomic investigation. For the collection of macro algae the bottles of 1000 ml capacity were used, and they were preserved as described earlier. For phytoplanktons, water samples were collected by Plankton Net, as per the methods adopted by Narkhede (2006). Twenty liters of surface water was collected (by standing in the back water of the dam at about 100-120 cm depth) by dipping a Jug at about 3 cm depth and was filtered through the Plankton Net; and was collected in 01 liter capacity wide mouth bottle. In laboratory, 20 ml of water sample was preserved as described earlier.

1) *Pediastrum simplex* **v.** *duodenarium* **(Bailey) Rabenhorst (Pl.1, Fig.1 & 2)**

Philipose, 1967, p 115, f 36d-h.

Colonies flat, 16-32-64 or 128 celled. Differs from the type in having large intercellular spaces or a single central space with the cells arranged in a ring at the periphery. Inner face of marginal cells concave, outer face prolonged into single delicately tapering processes. Sides of marginal cells also concave or nearly straight. Interior cells similar to marginal cells but with shorter processes. Cell wall smooth or finely punctate. Cells 14.4-25µ in diameter. Colonies 120 µ in diameter.

2) *P. ovatum* (Eher.) A.Braun (Pl. 1, Fig.3)

Philipose 1967, p 115-116, f 37a-g

Colonies flat, usually 4-8-16 celled, with the cells arranged in a ring around a central space or with one or more interior cells and a number of marginal cells, perforate or almost imperforate. The outer sides of peripheral cells with one process and central cells convex. Cell wall smooth or ornamented. Cells18-25.2µ in diameter. Colonies 95 µ in diameter.

3) ***P. duplex*** v. ***clathratum*** (A. Braun) Lagerheim (Pl.1, Fig 4)

Philipose 1967, p 123, f 43e

Colonies 8-64 celled, flat. Cells with more deeply emarginate sides and larger intercellular spaces than in *P. duplex*. Cells 9-25µ in diameter. Outer cells with two long stout processes. Inner cells without processes. Colonies up to 90 µ in diameter.

4) ***P. tetras*** v. ***tetraodon*** (Corda) Hansgirg (Pl.1, Fig. 5)

Philipose, 1967, p 129, f 45d, e and g

Colonies flat, rectangular, oval or circular, 4-8-16 celled without intercellular spaces. Marginal cells divided into two lobes by an incision on the outer side. Marginal cells very pronounced. Inner cell 4-6 sided. Cells 10.2-32.4µ in diameter. Eight celled colony 21-33 µ in diameter.

5) ***Closterium acerosum*** var ***angolence*** (Pl.1, Fig. 6)

Prasad and Misra, 1992, p 16, f 1,13

Cell large, 16-17 times longer than broad, lateral margins parallel, abruptly attenuated near rounded apices; chloroplast with 4-5 ridges and 13-15 pyrenoids arranged in a row. Long cell 500-523 µm; lat. Cell 30-31.5 µm.

6) ***C. decorum*** Breb. (Pl.1, Fig. 7)

Prasad and Misra, 1992, p104, p16, fig.11,12

Cell fairly large, 16-18 times longer than broad, moderately curved with 54-57 degrees of arc, median portion somewhat straight and broadly tumid, cell gradually attenuated towards the truncately rounded apices; cell wall finely striated; chloroplast ridged with an axial row of 10-14 pyrenoids. Long. cell 435-477 µm, lat. cell 25-27.5 µm, lat. apex 4-4.5 µm

7) ***C. ehrenbergii*** Menegh (Pl.1, Fig. 8, 9)

Prasad and Misra, 1992, p.17, fig. 1, 2

Cell large, stout, 6-8 times longer than broad, moderately curved, outer margin 92-110 degrees of arc, inner margin concave but inflated in the middle, cell gradually attenuate towards obtusely rounded apices; cell wall smooth; chloroplast with 6-8 bands and numerous scattered pyrenoids.

8) ***C. acerosum*** (Schr.) Her. (Pl.1, Fig. 10)

Suxena and Venkateswarlu 1965, pl 1, fig.3.

Cell large, more or less straight or faintly curved, narrowly fusiform, 11-14 times longer than broad, outer margin curved with 30-36 degrees of arc, inner margin almost straight; semicells gradually tapering to the rounded-truncate or subcute apices; cell wall apparently smooth; chloroplast with 3-5 ridges and 5-6 pyrenoids arranged in a row in each semicell.

9) C. pseudolunula Borge (Pl.1, Fig. 11)

Patel, 1979, pl 2, fig. 5

Cell large, 15-17 times longer than broad, lateral margins parallel, abruptly attenuated near rounded apices; chloroplast with 4-5 ridges and 8-9 pyrenoids arranged in a row. Long cell 271-301 µm; lat. Cell 40-48 µm.

10) ***C. acutum*** (Lyngb.) Breb. (Pl.1, Fig. 12)

Prasad and Misra, 1992, p 99, pl 16, f 4

Cells small, somewhat curved, 18-21 times longer than broad, outer margin 55-70 degrees of arc, inner margin not tumid; gradually attenuated to acute apices; cell wall smooth; chloroplast with 6-8 pyrenoids in a central series. Long cell 72-83µm, lat. cell 3.75-4.5µm.

11) ***C. incurvum*** Breb**.** (Pl.1, Fig.13)

Misra, Mehrotra, Jai Prakash and Srivastava, 2001, p 2, pl 2 f 8

Cells small, 6-7 times longer than broad, outer margin with 180 degrees of arc, inner margin concave but not tumid in the middle, cell attenuated towards acute apices, cell wall smooth, chloroplast ridged with 4 pyrenoids, arranged in a row. Long cell 95µm, lat. cell 13µm, lat. apex 1µm.

12) ***C. leibleinii*** Kuetz. (Pl.1, Fig.14)

Misra, Mehrotra, Jai Prakash and Srivastava, 2001, p 4, pl 2, f 6

Cells of medium size, 7-8 times longer than broad, strongly curved, outer margin with 154-180 degrees of arc, inner margin concave and slightly tumid in the middle, cell gradually attenuated to the acutely rounded apices, cell wall smooth, chloroplast with 4-5 ridges and a median row of 8-9 pyrenoids, long cell 229-235µm, lat. cell 31-37µm, lat. apex 7µm.

13) ***C. libellula*** Focke v**.** ***intermedium*** (Roy et Biss.) G.S. West (Pl.1, Fig. 15)

Prasad and Misra, 1992, p 110, pl 17, f 16

Cells of medium size, 5-6 times longer than broad, fusiform, more or less straight with both the margins moderately convex, cell gradually attenuated from middle towards broadly rounded and subtruncate poles; cell wall smooth; chloroplast with 5-7 ridges and 8-9 pyrenoids in an axile row. Long cell 139-142.5µm, lat. cell 24.5-27µm, lat. apex 10-12µm.

14) ***C. rectimarginatum*** Scott and Prescott**.** (New variety) (Pl.1, Fig. 16)

Scott and Prescott, 1961, sp 13, pl 1, f 28

Cells of medium size, about 6 times longer than wide, spindle-shaped, lateral margins almost perfectly straight from near the center to the narrowly rounded poles. Cell wall smooth, colorless. Chloroplast with about 5-8 continuous longitudinal ridges and 5-9 pyrenoids in a median row.

Discussion

Thirty seven taxa, represented with 13 genera have been reported from this area. Genus *Pediastrum, Closterium* occur dominantly in various locations. All these taxa are being reported for the first time from this area.

Reference

1) **Philipose, M.T. (1967)** *Chlorococcales*, Indian Council of Agricultural Research, New Delhi.
2) **Prasad, B.N. and P.K. Misra (1992)** *Fresh water algal flora of Andman and Nicobar Islands,* Vol. II, Bishen Singh Mahendra Pal Singh, Dehra Dun.
3) **Suxena M.R. and V. Venkateswarlu (1965)** Desmids of Andhra Pradesh, I from Pakhal Lake, Warangal, Hydrobiologia-XXVIII:49-65.
4) **Patel R.J (1979)** Desmids of Gujarat, India-I. Genus *Closterium* Nitzsch, Phykos, 18: 111-124.
5) **Misra, P.K., R.K. Mehrotra, Jai Prakash and A.K. Srivastava (2001)** Fresh water green algae from Basti district, Uttar Pradesh. *Geophytology* **31** (1 & 2):1-7.
6) **Scott, A.M. and G.W. Prescott (1961)** Indonesia Desmids. *Hydrobiologia* **17** (1-2): 1-132.

5. Geographical Analysis of Rehabilitated Village Tamaswadi

Chittam Rishikesh S.
Research Student, A.D.M.S.P.Ss Late Annasaheb R.D. Deore Art and Science College, Mhasadi Tal - Sakri
Patil Shivaji Bansilal
Assistant Professor of Geography, A.D.M.S.P.Ss Late Annasaheb R.D. Deore Art and Science College, Mhasadi Tal - Sakri

Abstract

In the present paper an attempt has been made to study the rehabilitated village Tamaswadi. Displacement of people due to construction of dam is world phenomenon. The displacement of people creates the problem of rehabilitation. The process of rehabilitation of people displaced as a result of the construction of dams and other developmental activities is quite different from the process arising from political and natural calamities. The problem of political and natural calamities is solved mostly by under taking hurried temporary relief work before the steps for permanent rehabilitation are taken. But the rehabilitation arising from the erection of dams entails a calculated well through preplaced programme. In the village Tamaswadi due to the Akkalpada dam the number of landless families is increasing up to 40%, Size of family is change and livelihood of people is disturbed.

Key Words – Rehabilitation, House, Landless, Amenities.

Introduction

Panzara medium project construct over the River Panzara. This is the major left tributary of river Tapi. Panzara medium project is few meter away from the village Akkalpada. This project is constructed for irrigation of the study area. A study area lies in 'Drought Prone Zone' of Maharashtra .This dam is very useful for agricultural as well as industrial development of the study area. It is 32 M high and 1935 M long it has 17 gates. Panzara medium project has right and left bank canal for the irrigation. It is economically useful for the development but affect on settlements like Vasamar, Tamaswadi and Sayyadnagar.

The settlements like Vasamar, Tamaswadi and Sayyadnagar are fully rehabilited due to Panzara medium project back water. These settlements disturbed not only his location but it

affects on socio-economic structure, site, size, morphology and house types of settlements. Present study focused on the facilities provided by government in the rehabilitated settlements of Panzara medium project.

Objectives

The main object of the present study is to assess the changes of rehabilited village.

Methodology

A. Literature survey B - Field work C - Laboratory work D - Data collection Data is collected from both primary and secondary sources.

i) Primary Sources:- Questionnaires field as per SIA for socio – economic review and discussion with the people of rehabilited villages.

ii) Secondary Sources:- The secondary data has been collected from the following sources.

1. Standard reference books.
2. Research Journals on Settlement and Rehabilitation.
3. Socio-economic abstract of Dhule District.
4. Websites.

Location

The location of village Tamaswadi is $20^{0}57^{I}50^{II}$ N latitudes to $74^{0}24^{I}32^{II}$ E longitude. The village is located in the area of Galana hills region which is the offshoots of Sahyadri ranges. The village is located in Sakri tehsil of the Dhule district. It is situated on Surat – Nagpur highway No.NH-6 near the village Mahir. The village has an area (60.81H). The annual rainfall is 51.4 cm. The soil character of the village clearly indicates the dominance of medium soil. Most of the area of village Tamaswadi is occupied by brown-murum soil. The natural vegetation of the area is dominated by typical monsoon deciduous type of forest; some parts have short thorny bushes. The main species found in the village includes neem, babhul pimpal,vad, chinch, mango khair, shisham and umbar.

Location of Tamaswadi Old and New

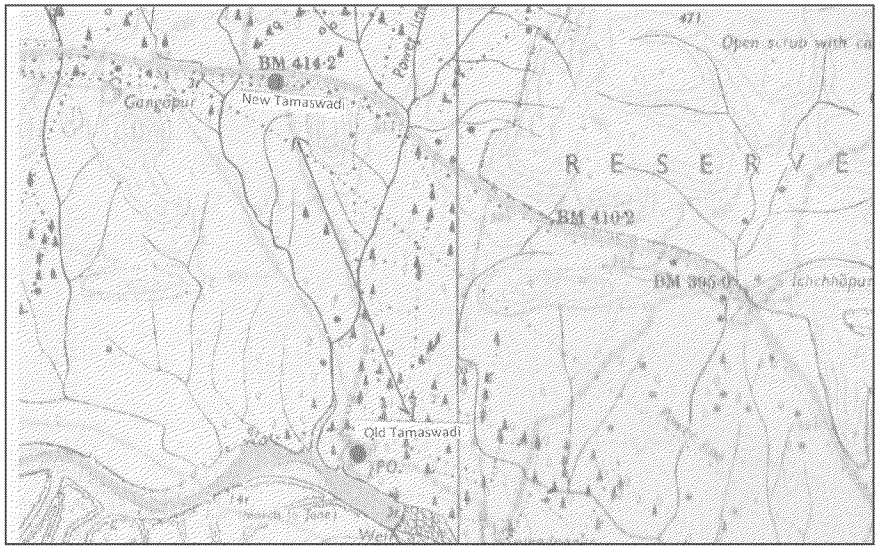


Fig. No. 01

Size of Houses

Available accommodations according to number of rooms represent a correct picture of the housing condition in the villages. The Table No. 01 and fig. No. 02 gives detail about rooms occupied and number of houses in the village Tamaswadi. It is observed that out of the total houses 36% houses are of 02 rooms 32% of 03 rooms and 10% houses are 04 rooms. Only 14% houses are 05 and 06 rooms. The observation shows that agricultural labours and cultivators have typical houses with a open space in front some of the houses have a courtyard. The front room of the houses is called 'Osari' and the single close room, which serve the purpose of Kitchen, Bedroom and Store.

Table No. 01 Size of Houses

Rooms	1	2	3	4	5	6	Total
No.of Family	04	18	16	05	04	04	50
%	08	36	32	10	08	06	100

Source: Compiled by the Researcher

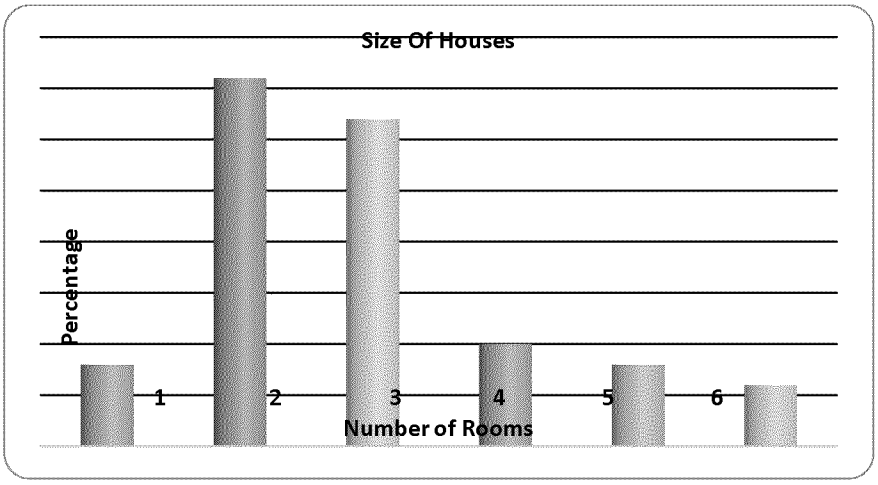


Fig. No. 02

Water Supply

In the Tamaswadi Village all families are depend on Public water supply Systems. There is no personal tap water connection. Sayyadnagar 42% families have its own Tap water connection. 44% families depend on the public water supply system. The water supply system in the village is not regular. The water supply pipeline is damaged at many places. The quality of water is very bad; no water purifier system is adopted by the Grampanchayat. There are frequent quarrels about the water supply. The frequency of water supply in summer is after 8-10 days. In rainy season, there is ample water supply, but the quality of water is very bad. Epidermis diseases due to water are headache of villagers. Few the families have no water supply connection they used hand pump. It is only water supply without purifier. The construction of water tank is enclosed with the compound and gate but it was broken.

Size of Family and Land Holding

It is observed in the village Tamaswadi that after rehabilitation the size i. e. No. of persons in the family is decreased because 94% families having only 0-6 person. Table No. 03 and Fig. No. 03

Table No. 03 Family Size

Sr.No.	No. of persons	No. of Families	Percentage
1	0-3	32	64
2	4-6	15	30
3	> 6	03	06
	Total	50	100

Source: Compiled by the Researcher

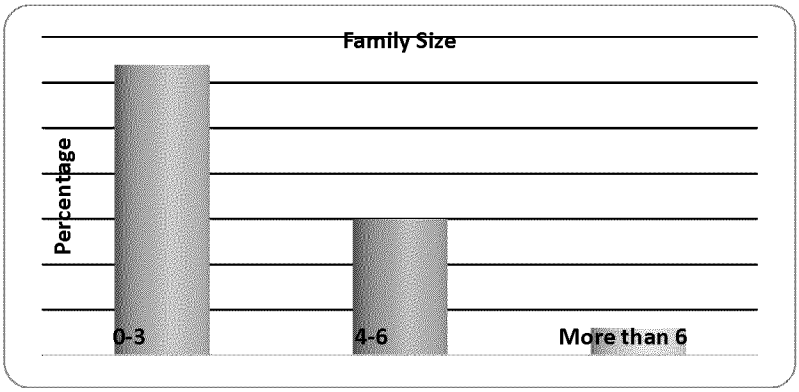


Fig No. 03

It is observed in Tamaswadi village that the land holding of families is decreasing. Only 12% families having more than 6 Acre land Table No. 04.

Table No. 04 Land Holdings

Sr.No.	Types	No. of Families	Percentage
1	Land less	20	40
2	0-3 Acre	14	28
3	4-6 Acre	10	20
4	> 6 Acre	06	12
	Total	50	100

Source: Compiled by the Researcher

Amenities

The Amenities like Aanganwadi, Bazar Ota, Bus stop, Temple, Ladies Toilet and Bathroom, Samaj Mandir, Shopping Complex and Z.P.School are available in the village Tamaswadi. Photo No. 1 and 2

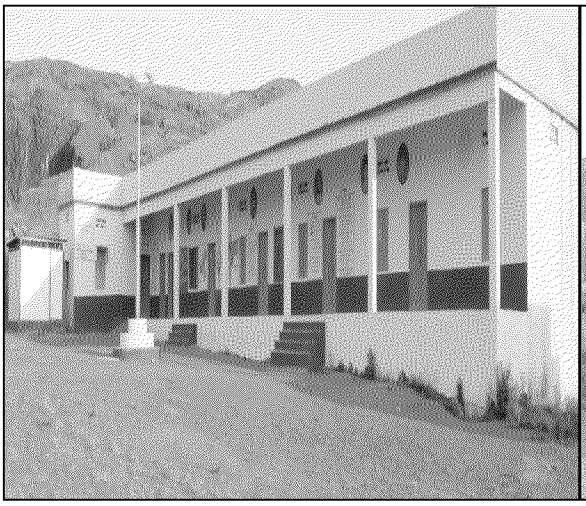


Photo No. 01

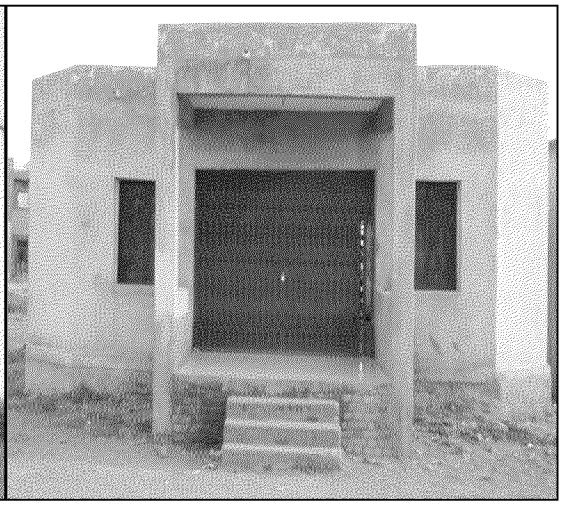


Photo No. 02

Conclusion

The above study clearly indicates that there are changes in physical scenario of the village. There are significant changes in the family size after rehabilitation. The basic amenities such as schools, water supply, health centers, community halls etc. have been provided bud improvement and maintenance of such amenities is very essential. Due to rehabilitation percentage of landless families is increased in Tamaswadi it is 40 %. There are significant change in the type of families has taken place from the period of before displacement to the present time. Before displacement, there is dominancy of joint families whereas after rehabilitation such dominancy is found in the nuclear type of families.

References

- Dr. Patil S. B. and Chittam R.S. (2012) "Landuse and settlement distribution of Dhule district (MS)" Patron , An International referred research journal Vol-III July 2012 Pp 63-67.
- Patil S.B, Chittam R.S (2013) "Impact of Akkalpada Dam on Agriculture of Dhule district (M.S) "The international research Journal of social sciences and Humanities Vol-2,No-1,Jan-2013 Pp.62-64 .
- Chittam R.S. and Patil S.B. (2015) "Facilities available in rehabilited settlements of Akkalpada dam in Dhule district (M.S.)" Golden Research Thought ,Vol -5 Issue – 3 Sept - 2015 Pp – 1- 4
- Chittam R.S. and Patil S.B. (2015) " Problems of rehabilited settlements of Akkalpada dam in Dhule district " ISRJ Vol – V Issue VIII – Sept 2015 Pp – 1-6.
- Chittam R.S. and Patil S.B. (2019) "Geographical analysis of rehabilitated village Sayyadnagar" **Ajanta** , peer reviewed referred journal , Vol – VIII , Issue –I , Jan.- March- 2019 English part – II Pp 131-135.

6. Global Warming and Agriculture

V. S. Patil
Uttamrao Patil Art's and Science College, Dahiwel.

Abstract

Global warming which is also referred to as climate change is the observed rise in the average temperature of the Earth's climate system. Global warming is a serious environmental issue. The causes are divided into two categories include "natural" and "human influences" of global warming. A 2008 study published in *Science* suggested that, global warming shows negative effect in many countries but positive effect in some parts of Africa. Geoengineering shows two types of approaches 1) Reducing emissions of and stabilizing the levels of heat-trapping greenhouse gases in the atmosphere (mitigation) 2) Adapting to the climate change (adaptation).

Key wards - Global warming, climate change, Agriculture, Mitigation.

Introduction

Global warming is a long-term rise in the average temperature of the Earth's climate system. Climate change is any regional or global change in the state of climate which lasts for decades or longer, including warming or cooling. Global warming" is an anthropogenic climate change. Increase in temperature in last 150 years is an impact of revolution of industries. The greenhouse gases are water vapor, carbon dioxide, methane, and nitrous oxide which are responsible for global warming.

Climate change affects agriculture in a number of ways, including through increase in average temperatures, rainfall, flood and droughts, heavy prolonged precipitation and excess cold. Conservation of forest, Conventional fossil fuels replace by renewable energy sources and adaptations are some remedy on global warming.

Global warming and Climate change

Global warming is a long-term rise in the average temperature of the Earth's climate system. Earth has risen between 0.4 and 0.8 °C over the past 100 years. Scientists from the Intergovernmental Panel on Climate Change (IPCC) have recently predicted that average global temperatures could increase between 1.4 and 5.8 °C by the year 2100. Global warming is also called as climate change. Global warming and climate change are two different terms which are

related to each other. Climate change is any regional or global change in the state of climate which lasts for decades or longer, including warming or cooling.

The greenhouse gases such as water vapor, carbon dioxide, methane, and nitrous oxide are responsible for global warming. The scientific consensus about the cause of the recent warming was summarized by the IPCC "Most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations.

Greenhouse gasses (GHG)

The most abundant greenhouse gas is water vapor but the extent of its contribution to global warming is not constant. It acts as a feedback to the climate.

Carbon dioxide - It is most important anthropogenic GHG. CO_2 is released through natural processes such as respiration and volcano eruptions and through human activities such as deforestation, land use changes, and burning fossil fuels such as petroleum, coal, and natural gas. Fossil fuel burning has produced about three-quarters of the increase in CO_2 from over the past 20 years. The rest of this increase is caused mostly by changes in land-use, particularly deforestation. The environmental impact of transport is significant because it is a major user of energy, and burns most of the world's petroleum which creates air pollution, including nitrous oxides, carbon dioxide and carbon monoxide. More than half of the CO_2.emitted is currently removed from the atmosphere within a century, some fraction (about 20%) of emitted CO_2.remains in the atmosphere for many thousands of years. Carbon dioxide levels increases from 280 parts per million to 400 parts per million in the last 150 years because of industrial revolution.

Methane - A hydrocarbon gas produced both through natural sources and human activities, including the decomposition of wastes in landfills, agriculture, and especially rice cultivation, as well as ruminant digestion and manure management associated with domestic livestock. According to the 2006 United Nations/FAO report, 18% of all greenhouse gas emissions found in the atmosphere is due to livestock.

Nitrous oxide – It is produced by soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning.

Chlorofluorocarbons (CFCs) – It is highly stable compounds industrial origin used in refrigeration units. CFCs have a lifetime in the atmosphere of about 20 to 100 years, and

consequently one free chlorine atom from a CFC molecule can do a lot of damage, destroying ozone molecules for a long time and depletion of the ozone layer.

The environmental impact of aviation occurs because aircraft engines emit gases which contribute to climate change. In the EU, greenhouse gas emissions from aviation increased by 87% between 1990 and 2006.

The environmental impact of shipping includes greenhouse gas emissions and oil pollution. In 2007, carbon dioxide emissions from shipping were estimated at 4 to 5% of the global total, and estimated by the International Maritime Organization (IMO) to rise by up to 72% by 2020 if no action is taken. The First Intercessional Meeting of the IMO Working Group on Greenhouse Gas Emissions from Ships took place in Oslo, Norway on 23–27 June 2008. It was tasked with developing the technical basis for the reduction mechanisms that may form part of a future IMO regime to control greenhouse gas emissions from international shipping,

General military spending and military activities have marked environmental effects. Several studies have also found a strong positive correlation between higher military spending and higher emissions. Increased military spending has a larger effect on increasing carbon emissions in the Global North than in the Global South.

Changes resulting from global warming may include rising sea levels due to the melting of the polar ice caps, changing precipitation, and expansion of deserts in the subtropics. Increase in occurrence and severity of storms and other severe weather events. Other likely changes include more frequent extreme weather events such as heat, waves, droughts, wildfires, heavy rainfall with floods, and heavy snowfall, ocean acidification.

Effects significant to humans include the threat to food security from decreasing crop yields and the abandonment of populated areas due to rising sea levels.

Effect of Global Warming on Agriculture

A 2008 study published in *Science* suggested that, due to climate change, "southern Africa could lose more than 30% of its main crop, maize, by 2030. In South Asia losses of many regional staples, such as rice, millet and maize could top 10%.

More detailed analysis of rice yields by the International Rice Research Institute forecast 20% reduction in yields over the region per degree Celsius of temperature rise. Rice becomes sterile if exposed to temperatures above 35 degrees for more than one hour during flowering and consequently produces no grain

The positive side of global warming should be considered as well. For example, higher CO2 concentrations promote photosynthesis of plants. This phenomenon is called the “CO2

fertilization effect," as it promotes growth and boosts yields. Small changes caused by global warming, such as a longer growing season, a more temperate climate and increased CO_2 concentrations, may benefit Australian crop agriculture and forestry in the short term.

Climate change affects agriculture in a number of ways, including through increase in average temperatures, rainfall, flood and droughts, heavy prolonged precipitation and excess cold.

Elevated CO_2 increases crop yields and growth through an increase in photosynthetic rate, and it also decreases water loss as a result of stomata closing. The growth response is greatest in C_3 plants, C_4 plants are also enhanced but to a lesser extent, and CAM Plants are the least enhanced species. The variation in temperature and precipitation above threshold value may affect photosynthesis and transpiration process in crops.

Rising levels of atmospheric carbon dioxide reduce the concentrations of protein and essential minerals in most plant species, including wheat, soybeans, and rice. It also reduces the nutritional value of most food crops. However, concentrations of iron and zinc, vitamin b which are important for human nutrition, would be lower This direct effect of rising CO_2 on the nutritional value of crops represents a potential threat to human health. Excess rainfall and flood may leads to physical damage and reduce yield of crop.

Some evidence suggests that droughts have been occurring more frequently because of global warming. Droughts result in crop failures and the loss of pasture grazing land for livestock.

Many weeds, insects, pests, disease vector and fungi thrive under warmer temperatures, wetter, climates, and increased CO_2 levels. It affects agricultural inputs such as herbicides, insecticides and fertilizers

Climate change affects crop productivity stability, plant physiological process, crop growth, yield, quantity and quality of food.

The Fourth Assessment Report (AR4) of the United Nations Intergovernmental Panel on Climate Change (IPCC) describes the impact of climate change on food security. South Asia and South Africa would likely suffer negative impacts on several crops which are important to large food insecure human populations. Climate change can disrupt food availability, reduce access to food, and affect food quality. It affects food security at the global, regional, and local level.

The Paris Agreement's long-term goal is to keep the increase in global average temperature to well below 2 °C above pre-industrial levels; and to limit the increase to 1.5 °C, since this would substantially reduce the risks and effects of climate change.

Geoengineering approaches

These are of two types

1. Reducing emissions of and stabilizing the levels of heat-trapping greenhouse gases in the atmosphere **(mitigation)**
2. Adapting to the climate change **(adaptation)**.

1. Mitigation

Climate change mitigation is actions to limit the magnitude and/or rate of long-term climate change. Climate change mitigation generally involves reductions in human (anthropogenic) emissions of greenhouse gases (GHGs).

1. Current world population is 7.7 billion. The rapid increase of human population is putting an incredible strain on our environment. In order to support the growing population, forests are being destroyed at an alarming rate. Humans also continue to put a great demand on the natural resources of our planet. Many non-renewable resources are being depleted due to the unrestrained use of fuel and energy. So to control human population is most essential to decrease overload on resources like energy which ultimately reduce emission of GHGs.
2. Reduce deforestation and forest degradation. Promote forest conservation and sustainable management. Plant more tree for environmental, social and economic benefits.
3. Agricultural soil management practices can lead to production and emission of nitrous oxide (N2O), a major greenhouse gas and air pollutant. Activities that can contribute to N_2O emissions include fertilizer usage, irrigation, and tillage residue mulching, cover cropping, and crop rotation, use of bio fertilizer all of which are more widely used in organic farming than in conventional farming.
4. Cattle livestock's account for one third of emissions, through methane emissions. Manure management and rice cultivation also produce gaseous emissions. Use this in biogas plant for fuel.
5. Conventional fossil fuels replace by renewable energy ensuring access to low and zero carbon energy solutions, such as solar, wind, tide, hydropower, biomass and geothermal energy
6. Renewable bio-fuels for transportation such as ethanol fuel and biodiesel. They have contributed to a significant decline in oil consumption in the United States.

7. Due to lower carbon dioxide emissions, switching to CNG can help mitigate greenhouse gas emissions. For example, an engine running on petrol for 100 km emits 22 kilograms of CO_2, while covering the same distance on CNG emits only 16.3 kilograms of CO_2.
8. Personal cars are extremely inefficient at moving passengers, while public transport is many times more efficient
9. Heat pumps (air conditioners and freezers) are three to four times more efficient in their use of electric power than simple electrical resistance heaters. Technology used in heat pumps could reduce global CO_2 emissions by 8% annually. Using surplus renewable energy in heat pumps is regarded as the most effective household means to reduce global warming and fossil fuel depletion.
10. LED light bulbs use up to 80 percent less energy than conventional incandescent. A10-watt LED that replaces your traditional 60-watt bulb.
11. Use Carbon capture and storage technology - waste carbon dioxide (CO_2) from large point sources, such as fossil fuel power plants, transport it to a storage site, and deposited it where it will not enter the atmosphere.
12. Reuse and recycle products can reduce load of industries and help to great extend to eradicate global warming.

2. Adaptation

Adaptation is response to global warming that seeks to reduce the vulnerability of social and biological systems to relatively sudden change and thus offset the effects of global warming. Even if emissions are stabilized relatively soon, United Nations Intergovernmental Panel on Climate Change and governments at various levels are work for better adaptation.

References

1. Aggarwal PK, Kumar SN, Pathak H (2010) Impacts of climate change on growth and yield of rice and wheat in the Upper Ganga Basin. Indian Agricultural Research Institute (IARI).
2. Jain SK, Kumar V (2012) Trend analysis of rainfall and temperature data for India. Current Sci 102: 3e 7-49.
3. Mahato Anupama (2014) Climate change and its impact on Agriculture. International Journal of Scientific and Research Publication. 4:4.
4. Neenu S, Biswas AK, Rao AS (2013) Impact of climatic factors on crop production-a review. Agri Rev 34: 97-106.

7. Global Warming: Impact on Library

Prof. Pran V. Karmarkar
Librarian, NTVS's College of Law Institute of Legal Education & Research, Nandurbar.

Abstract

This paper presents a Global Warming its impact on library. Global warming and climate change while closely related and sometimes used interchangeable technically refer to two different things. If climate change has effects on agriculture, business and on the entire national economy, it must also have serious effect on library and information materials, services and the personnel. The greenhouse gases effect is when the temperature rises because the sun's heat and light is trapped in the earth's atmosphere.

Introduction

Climate change has been challenging human brain to cope up with it. Enlarging our brain's potential by giving 'N' number of problems and difficulty, but by the grace of our ancestors from all over the world we have plenty of resources which are being used to understanding about climate change and those the resources driving us to solution and new invention. Global warming and climate change – while closely related and sometimes used interchangeably – technically refer to two different things: "Global warming" applies to the long-term trend of rising average global temperatures. "Climate change" is a broader term that reflects the fact that carbon pollution does more than just warm our planet. Carbon pollution is also changing rain and snow patterns and increasing the risk of intense storms and droughts. Library is a storehouse of books. Library is an important part of every educational institute such as schools, colleges and universities. It contains a wide range of resources vital for the students. Libraries attract people to read and develop habit of reading and learning. It increases their thirst for reading and expands knowledge. Library is also essential for any kind of research on different subjects. If climate change has effects on agriculture, business and on the entire national economy, it must also have serious effect on library and information materials, services and the personnel.

The Concept and history of Global Warming and library

The term Global Warming refers, to the observation that the atmosphere near the earth's surface is warming. This warming is one of many kinds of climate change the Earth has gone through in the past and will continue to go through in the future. Increase in the global average

surface temperature resulting from enhancement of the greenhouse effect, primarily in air pollution. Global warming is when the earth heats up the temperature rises. It happens when green-house gases carbon dioxide, water-vapour, nitrous oxide, and methane trap heat and light form the sun in the earth's atmosphere, which increases the temperature. This hurts many people, animals and plants. Many cannot take the changes, so they die

Libraries were always a part of the society, In earliest times there was no distinction between a record room or archive and a library, and in this sense libraries can be said to have existed for almost as long as records have been kept. In India paintings in caves, manuscript preserve in temples, and pitikas in Buddhist stupas, since 2500 to 4000 years ago. A temple in the Babylonian town of Nippur, dating from the first half of the 3rd millennium BC, was found to have a number of rooms filled with clay tablets, suggesting a well-stocked archive or library. Similar collections of Assyrian clay tablets of the 2nd millennium BC were found at Tell el-Amarna in Egypt. Ashurbanipal reigned 668–c. 627 BC, the last of the great kings of Assyria, maintained an archive of some 25,000 tablets, comprising transcripts and texts systematically collected from temples throughout his kingdom.

Global Warming and libraries significant

Temperature increases will have significant impacts on human activities, including where we can live, what food we can grow, how and where we can grow food, and organisms we consider pests can thrives. To be prepared for the effects of these potentials impacts we need to know how much the earth is warming, how long the Earth has been warming, and what has caused the warming. Answers to these questions will not only provide us with a better basis for making decision related to issues such as water resources and agricultural planning, it will also enable us to take precautions on the aspects it affects our profession. Libraries are important cornerstones of a healthy community. Libraries give people the opportunity to find jobs, explore medical research, experience new ideas, get lost in wonderful stories, while at the same time providing a sense of place for gathering.

Green house Effects

The greenhouse gases effect is when the temperature rises because the sun's heat and light is trapped in the earth's atmosphere. This is like when heat is trapped in a car. On a very hot day, the car gets hotter when it is out in the parking lot. This is because the heat and light from the sun can get into the car, by going through the atmosphere, but it can't get out. As a result, the temperature rises .Our planet absorbs radiant energy from the sun and emits some of that energy back to space. The term greenhouse effect describes how water vapour, carbon dioxide, and

other greenhouse gases in the atmosphere alter the return of energy to space, and in turn, change the temperature at the Earth's Surface. These greenhouse gases absorb some of the energy that is emitted from the Earth's surface, preventing this energy from being lost to space. As a result, the lower atmosphere warms and sends some of this energy back to the Earth's surface.

Green House Gases

Greenhouse gases are gases in the Earth's atmosphere that collects heat and light from the sun. With too many greenhouse gases in the air, the earth's atmosphere will become too hot which lead to catastrophic effect on human, plants and animals. Greenhouse gases occur naturally in the earth atmosphere, but are also being added by human activities. This happens primarily through the burning of fossils fuels, such as coal, oil and natural gas, which releases carbon dioxide to the atmosphere. Many scientists have now concluded that global warming can be explained by a human caused enhancement of the greenhouse effect

Global Warming and the Environment

Global warming is affecting many parts of the world. Global warming makes the sea to rise, and when the sea rises, the water covers many low land islands. This is a big problem for many of the plants, animals and people on islands. The water covers the plants and causes some of them to die. When plants and animals die, people lose two sources of food, plant food and animal food. People may also lose their homes. As a result, they would also have to leave the area of die. The oceans are affected by global warming in other was as well. With the oceans getting heated up, it is harming and killing algae on the ocean. An alga is a producer that we can see floating on top of the water. Algae produces food for other animals through photosynthesis, and serves as food to many consumers in the ocean such as small fishes, crabs, whales and may other animals. When the alga is destroyed as a result of too much heat, it has spiral effect on other animals in the sea, and consequently, man is affected. Global warming does not only affect plants and animals in the sea, it is also destroying many big forests. The pollution and causes global warming is linked to acid rain. Acid rain gradually destroys almost everything it touches. Global warming is linked to acid rain.

The Library and environment Change

Libraries all over the world have several factors justifying their existence. Libraries can be learning –Centre, information providers, cultural institutions, guardians of a cultural heritage as well as architecturally exciting monuments that together with museums, religious centres and other significant buildings make up an important part of a city's profile. A library is always a storage space for library materials and a working place for both personnel and patrons. To be

able to effectively perform its functions as a safe storage space for information, it is necessary to surround the collections with technical systems which will protect the materials form damage and chemical breakdown that otherwise would make the materials inaccessible in a near or distant future. Preservation is therefore a core issue for that information for the future. National Libraries Universities, public libraries as well as special libraries have this responsibility. Crucial factors for a successful protection of a library collection are for example, proper care and handling, practical conservation treatments and digitization, or other means of duplicating. A disaster plan is essential, and, the perhaps the most effective means of slowing down the chemical deterioration is storage of materials that are to be kept for use both now and future, in climatically controlled Stacks. Chemical breakdown is considered to be double per every ten degrees 0C, and low temperature storage is therefore ideal. High levels of humidity can cause mould in both the high and low temperature cause mould in both the high and low temperature range which has to be kept under control. In a hot and dry climate, desiccation can cause significant distortion in certain materials such as vellum. Thus, in cognizance of the difficulties involved in climate control, IFLA guidelines states "in general, the library materials should be stored and used in stable condition such are not too hot, too dry, and not too dump".

Energy and Libraries

During the heat wave in Europe in the summer of 2003, technical systems were strained on the breaking point in libraries and other institutions in the cultural sector, which are dependent on an even preservation climate for the safe guarding of their collections. Building such as the museum of modern art in Vienna, with its black basalt stone facade, and the Bibliotheque Nationale in Paris with its glass towers, both had problems keeping the temperature within reasonable levels. The innovative energy system contains the following elements:

1. A highly insulated envelope
2. Effective solar shading which uses natural elements such as trees and roof overhangs as well as shading by
3. An exposed internal concrete construction, which retains the heat,
4. An efficient low-pressure mechanical ventilation system
5. An electrically powered heat pump for heating via the air and thermostatically controlled perimeter radiators.
6. The summer, it cools the building, making further air conditioning and refrigerating unnecessary.

The Approach Forward

Climate change is an issue that cannot be solved overnight, or with any one policy. It is an intergenerational problem which needs to be addressed by ensuring that all policies which impact on how we live on this planet takes climate change seriously into account. This requires acting with a sense of urgency. The starting point for action and political leadership is recognition on the part of governments that they are confronted by what may be the gravest threat ever to have faced humanity. As a priority, the world needs a binding international agreement to cut greenhouse gas emissions across a long time horizon. The developing countries have to be party to that agreement to make commitments to reduce emissions. Any multilateral agreement without quantitative commitments from developing countries will lack credibility in terms of climate change mitigation. At the same time, such agreement should incorporate provisions for finance and technology transfer from the rich nations that bear historic responsibility for climate change. The issue of climate change adaptation should also be addressed through international cooperation. Governments should make provision for national carbon budgets. Carbon budgeting backed by radical energy policy reforms and government action to change incentives structures for customers and investors is the foundation for effective climate change mitigation. In a tropical climate, it is excessive heat and dampness that pose a threat to library collections and huge sums of money is being spent on air-conditioning to present the decay of library collections which is caused by mould and heat. Library buildings should be constructed using modern technology with excellent systems to cope for the benefit of preserving library collections equipment and personnel.

- Libraries should include global warming in user-education programs.
- Libraries should recycle their old papers, rather than resorting to burning or discarding them to avoid fossil being emitted to the atmosphere.
- Libraries and their management should ensure that their staff work in an air conditioned environment in order to avoid heat wave and stay healthy. This presupposes that all the necessary infrastructures should be in place.
- Awareness campaign should be carried to schools, market places and other public place with emphasis on the role of individuals at mitigating the effects of climate change.
- To further drive home the message on global warming, programmes should be regularly organized in both radio and television programmes in local languages of various ethnic groups in India.

- ❖ As part of the government's effort at combating global warming effects, environmental sanitation exercise which is observed monthly should be given legislative backing to achieve the much desired result.

Conclusion

The present paper study revolted that awareness and knowledge of library profession toward causes health and library collection effect of global warming was inadequate. If library services provided most effectively to user so library has protect our collection from global warming because global warming is a challenging problem that necessitates immediate treatment. Libraries should recycle their old papers, rather than resorting to burning or discarding them to avoid fossil being emitted to the atmosphere.

References

1. Environmental Law by Dr. J.J. Upadhyay, 2nd edition, central law agency 2008)
2. Environmental Studies by S.R. Myneni, Asia Law House, New Edition 2008
3. NOAA Satellite and Information Services (https://www.nesdis.noaa.gov/)
4. Think quest, 2008www.oracle.com/us/corporate/press/017429
5. United States Environmental Protection agency, 2001(https://en.wikipedia.org /wiki/United_States_Environmental_Protection_Agency)
6. India Meteorological Department (www.imd.gov.in)
7. Library - The history of libraries www.britannica.com
8. History of the greenhouse effect and global warming (www.lenntech.com)

8. Global Warming: Implication for Library Professionals

Sarika Bhagwanrao Rengunthwar
Librarian, Kohinoor Arts, Comm. & Sci. College Khultabad, Tq.Khultabad Dist. Aurangabad.

Abstract

This study examined global warming and its implication for library professionals. The problems associated with global warming were identified and solutions proffered. The issue of climate change adaptation should also be addressed through international cooperation and libraries should include global warming .Global warming should be one of the points of emphasis and should recycle their old papers, rather than resorting to burning or discarding them to avoid.

Keyword: Global Warming, Green gas, Library Climate change

Introduction

Climate change is the defining human development is ultimately about expanding human potential and enlarging human freedom. Climate change threatens to erode human freedom and limit choice.

Climate change is now scientifically established fact. Today we are witnessing at firsthand what could be the onset of major human development reversal in our life time. The exact impact of greenhouse gas emission is not easy to forecast and there is a lot of uncertainty in the science when it comes to predictive. In the long run climate change is a massive threat to human development and in some places it is already under running the 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.

This provides the motivation for the authors of this paper to address the implication of global warming on the Library professionals. If climate change has effects on agriculture, business sand the entire national economy, it must also have serious effect on library and information materials, services and the personnel.

Objectives of the study

The study has the following objectives

1. To create awareness and sensitize information professionals on Global Warming.
2. To examine the implication of Global warming on Library professionals.
3. To suggest ways to combat the effects of climate change on library services.

Global Warming

Global Warming refers, to the observation that the atmosphere near the earth's surface is warming. This warming is one of many kinds of climate change the earth has gone through in the past and will continue to go through the future.(NOAA satellite and information services, 2008)

Import ants of Global Warming

Temperature increases will have significant impacts on human activities, including where we can live, what food we can grow, how and where we can grow food, and organisms we consider pests can thrives. To be prepared for the effects of these potentials Impacts we need to know how much the earth is warming, how long the earth has been warming and what has caused the warming.

Green House Gases

Greenhouse gases are gases in the Earth's atmosphere that collects heart and light from the sun. with too many greenhouse gases in the air, the earth's atmosphere will become too hot which lead to catastrophic effect on human, plants and animals.

Global Warming and the Environment

Global Warming is affecting many parts of the world. Global Warming makes the sea to rise, and when the sea rises, the water covers many low land islands. This is a big problem for many of the plants, animals and people on islands .The water covers the plants and causes some of them to die when plants and animals die, people lose two sources of food , plant food and animal food. People may also lose their homes. As a result, they would also have to leave the area of die.

Causes of Global Warming

Many things causes global warming

The following causes of global warming have been identifies

1. Electrical pollution.
2. Burning of fossils fuels,e.g.oil and petroleum

3. Destruction of carbon sinks on the earth which carbon
4. The release of greenhouse gases, especially co2

The Library and Climate Change

Libraries all over the world have several factors justifying their existence. Libraries can ve learning- centre, information providers, cultural institutions, guardians of a cultural heritage as well as architecturally exciting monuments that together with museums, religious centers and other significant buildings make up an important part of city's s profile

A Library is always a storage space for library materials and a working place for both personnel and patrons. To be able to effectively perform its functions as a safe storage space for information it is necessary to surround the collections with technical systems which will protect the materials form damage and chemical breakdown that otherwise would make the materials inaccessible ina near or distant future. Preservation is therefore a core a issue for that information for the future. National libraries as well as special libraries

Crucial factors for a successful protection of a library collection are for example, proper , care handling practical conservation treatments and digitization, or other means of duplicating.

Energy and Libraries

1. A highly insulated envelope
2. Effective solar shading which uses natural elements such as trees and roof overhangs as well as shading by louvers run by photovoltaic.
3. An efficient low –pressure mechanical ventilation system.
4. An exposed internal concrete construction, which retains the heat.

References

- Ebunuwele, G. E Global warming : Implication for Library and Information Professionals " Internationals Journals of humanities and social science P.69-77 Vol.5 No.6 (1) June 2015.
- Abutu,Alex (Tuesday 3, 2009 Climate Change: between politics and Reality.Daily Independent P.7
- Eco Bridge (2009) Causes of Global Warming Mhtml: File ://C:// users/ihoevbie/ Desktop/Climate Change/Global Warming the Cause.
- Bankole, Dimeji (February 16,2009) Climate Change :Britain Raise Alarm Over Independent Global Catastrophe financial Standart. P.45.

9. Global Warming, Climate Change and Problem of Environmental Degradation

Desale Ganesh Baban
Dept. of Geography, Late Annasaheb R.D.Deore Arts and Science College, Mhasadi, Tal-Sakri, Dist-Dhule.
Patil Shivaji Bansilal
Dept. of Geography, Late Annasaheb R.D.Deore Arts and Science College, Mhasadi, Tal-Sakri, Dist-Dhule.

Abstract

"Global warming and climate changes" refer to an increase in average global temperature. Natural event and human activity are believed to be contributing to an increase in greenhouse gases such as carbon dioxide the climate is changing. The earth is warming up and there is now overwhelming scientific consensus that it is happening, and human induced with Global warming on the increased and species and their habitat on the decrease chances for ecosystem to adapt naturally are diminishing may are that agreed that climate change may be on the greatest threat facing the planet resent year show on impact of environmental and show the environmental degradation on affect of the global warming in increasing temperature. Climate changes refer to the variation in the earth global climate or in the regional climate over time it describe changes in the variability or average state of the atmosphere over time scale ranging from decades to millions of years. These changes can be caused process of external to the earth the variations of all mechanical, chemical, and biotic factor to the influence of the climatic changes and global warming. In the present paper global warming problem are shown as environmental degradation and climatic changes. The data has been collected from secondary sources. Some data has been collected by using the theoretical method. Method for research has been applied and the interferences are drawn.

Keywords: Environmental degradation, climate change, global warming.

Aims and Objectives

The objective of this research paper is to study the problem of environmental degradation due to global warming and climate change. For the present study following objectives are considered

i) To identify the problem of environmental degradation and global warming, climatic changes.

ii) To present relationship between impact of degradation on climate change.

Database and Methodology

The present research work is based on secondary data collected from various sources. For the present study data regarding degradation of climate change is obtained from secondary sources i.e. Research journals, papers, books and articles are scanned from various libraries and from online sources.

Introduction

Recently at both national and international forums there have been discussion regarding climate changes and environment complication as a cause insecurity global change of climate and environmental degradation affecting from human practices are evident as backed up by scientific exploration this present paper leading the discuss causes of climate change and environmental degradation how they threaten international peace and cooperation basing on recent data. To most people of the environmental degradation and pollution are synonym as both are concerned with the lowering of the quality of the environment but a distinction between these two aspect of the lowering and deterioration of the quality of the environment may be drawn on the basic of causative factor and scale of deterioration of environment quality in term of magnitude intensity and covered area. To my mind environmental lowering of the quality of environmental local scale caused exclusively by human activities whereas environmental degradation means lowering environmental quality at local regional and global scale by both natural process and human activity there are causes of degradation natural hazard and man induced hazard are the natural factor cause destabilization of ecosystem and thus cause environmental degradation.

The primary cause of environmental degradation is human disturbances. The degree of environmental impact varies with the cause, the habitat, plant and animals inhabits it. Human and their activities are a major source of environmental degradation worldwide the greatest affection the health of individual and population result from environment degradation , social injustice the two operate in consort. Causes include of air and water pollution, deforestation. Global warming the third war debt crisis are militarization war. Climate variability and the accompanying environment deterioration have recently been recognized to pose serious security factor of

national and international peace a d cooperation. The security implications of climate variability and environment deterioration have gained much attention enhancing its prioritization in varies international forum as an agenda for discussion. Although some people disregard the idea that climate change threaten global peace, many other have taken it seriously as a result inter governmental panel on climate change was established through the guidance of the United Nations Environment Program collaboration with world metrological organization which mandate is to enlighten the countries across various region with an up To data on climate change and its impact. Such information directs various governments on the formulation of policies to adequately respond to the problem resulting from climate change and environmental degradation.

Climate Change and Environmental Degradation

To understanding the most people, climate change denotes the alteration of the environment which result from human activity as the improper disposal of wastes combustion of fuels, the inadequacy of forested area, and other influential factor that increased the amount of green house gases in the atmosphere officially, as defined by the un framework convention on acclimate change it is the alteration on the world environment as a result of direct and indirect human activities and practices as well as natural climate variability witnessed over comparable years. It ultimately change the composition of the global atmosphere , environmental degradation implies that the degeneration of the ecosystem is a result of the over depletion of naturally existing natural resource which support phenomena such as reduce soil fertility the forms and mentioned earlier environmental degradation impact the available livelihood pattern of production triggering various types of movement. Organic matter is one of the significant constituent of soils it frame soil structure and stability water and oxygen holding capacity and numerous soil micro flora and fauna.

Deforestation

The tropical constitutes seven percent of surface on the earth over a fifty percent of the plants and animal species half of all tropical forest have been damages by 2010 three –quarters may be lost. Additionally ,twenty to fifty percentage of global wetland have been destroyed loss of old growth forest has recently particularly affected of the forest are invaluable property of a nation because they provide raw material to the modern industries for timber building purposes habitat for numerous type of animal and micro organism good and friable and nutrients soil having high content of organic matter offer protection to soil by binding the soil throe the

network of their roots and by the protecting to the soil from direct impact of failing raindrops they encourage and increased infiltration rain water and thus allow maximum recharge of ground water resources minimum surface run off and hence reduce the frequency intensity and dimension of floods they help in increasing the precipitation they are natural sink of carbon dioxide to prepare them food during to the process of photosynthesis they provide fire wood to millions of people all over the world and food and shelter to innumerable human and animals. in fact forest are "lifeline" of nation because prosperity and welfare and directly society depend and sound and healthy forest cover of a nation concerned forest are main components of the biotic components of the natural environment system and the stability of the environment and ecological balance largely depend on the status of the forest of the region concerned.

Global Warming

In the 20 th century, the global mean temperature has increased by about 0.6^0C. The average temperature of the earth may increase by 1.4 to 5.8 ^{0} C by the year 2100 from 1990. It is expected that the rise in temperature will be marked in the regions of middle and higher latitude. The precipitation will increase at higher latitude but will decrease at lower latitudes. The Frequency of extreme drought and floods will increase. Global warming will reduce crop production due to increased incident of plant disease and pests, explosive growth weeds and weeds and enhanced basal rate of respiration of plant. In temperature regions, small rice in temperature change will decrease the crop productivity there. Environmental degradation decrease by the causes of all surface of the gases energy absorption by some atmospheric gases in included carbon dioxide, methane, chlorofluorocarbons, ozone, water vapors. The consequent increased in the global mean temperature is referred to as global warming.

Photo No. 01

Photo No. 02

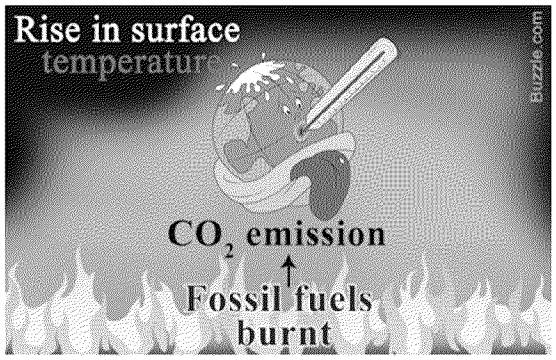


Photo No. 03

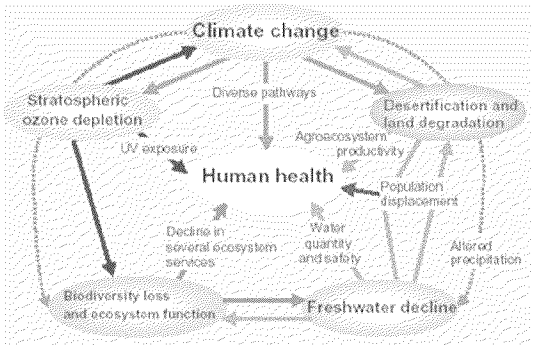


Photo No. 04

Conclusion

It is apparent from the aforesaid discussion that the process and causes for the environmental degradation present a gloomy picture for future life and all the development work are anti nature because these degrade the environment human society but the development should not be at the cost of the environmental because it is the natural environment which insure are existence. Also the pressure in scarce resource my degenerate into wars due to competition the health status of the citizen may also endangered to the developed economics as well as their livelihood as a result of impact of climate change there is the need of country and other alien collective roll in reducing these threat of climate changes. To my mind as a stated earlier the root cause of environmental degradation imbalance is population growth such as rapid rate of deforestation because of industrial and urban expansion of agriculture development and ever creasing use of chemical use fertilizers pesticide increased to limit those diction items which relies ozone depletion gases like chlorofluorocarbons haloes to limit the use of hydrocarbons to reduce the realize of green house gases to stop the production of nuclear weapons to educate the people about the environment. International agencies and organization should follow up on the established function of each country and hold them responsible for ensuring they actively participate in controlling climate change. If necessary trading restrictions can be imposed on the defiant nations since their failure to ever climate change endangers the security of its people and other countries. At the national level, the climate regulating agencies and organization should impose penalties to the defaulters of instituted guidelines of attaining environmental friendly planet.

References

- **Savindra Singh. (2006) "**Environmental Geography", Prayag pustak bhavan 20-A, university road Allahabad.
- **Swati Tyagi. Nilam Garg. Rajan Paudel. (2014)** "Environmental degradation: causes and consequences''Vol.81,no. 8-2,Pp.1498.
- **Nafi ahemad. Taherul islam khan. Aboh Augustine. (2018)** "climate change and environmental degradation: a series threat to global security", European journal of social sciences studies.volume-3.
- **Dr. Vijay mittal. (2012)** "Global warming and climate change", Oxford Book Company, gopalpura road , jaipur 302018 Rajsthan.
- **Rajeshkumar. Amar jyoti das.(2014)** "climate change in impact on land degradation: imperative to need focus journal of climatology and weather forecasting2;108 doi 10.4172/2332-2594.1000108
- **D Lenka (2011) "**Climate Weather and crops in India", kalyani publishers rajindar nagar ludhiyana.
- **Frederick, Kenneth D. And David c Major. "**Climate change and water resources" Climate change 37.1(1997) Pp 7-23.
- Websites - Wikipedia .

10. Global Warming, Human Development and Eco-Criticism

Dr. Bhavana Mukutrao Patil
GET'S Arts Comm. & Science College, Nagaon, Dhule.

Abstract

Global Warming is become a burning issue for not just one country but all over the world. The globe faces various crises; the global warming has become global warning. The term, 'Global warming' is a broad, in the modern context it is commonly used inter changeably, it is specifically relates to worldwide surface temperature increases, The average temperature of the Earth's climate has risen by about 1^0c in the last five centuries and of this half of the warming is caused in 20^{th} century alone. Now days it is increasing at an alarming rate which effect on many parts of the world. The impact of climate change is on various factors of Nature. The Global warming harms the biosphere and human life in alarming proportions. The conservation of nature has always been a prime concern of Environmental literature i.e. Ecocriticism. So the need of collaborative work for environmental literary studies has become imminent. The role of literature in environmental studies has become very crucial in the present times due to the emergence of the critical mode of ecocriticism. Ecocriticism is a new, emerging field and quite a recent phenomenon in the world of literature.

Keywords: Global warming, Human development, Eco Criticism**.**

Introduction

Global Warming is become a burning issue for not just one country but all over the world. The globe faces various crises; the global warming has become global warning. The term, 'Global warming' is a broad, in the modern context it is commonly used inter changeably, it is specifically relates to worldwide surface temperature increases, The average temperature of the Earth's climate has risen by about 1^0c in the last five centuries and of this half of the warming is caused in 20^{th} century alone. Now days it is increasing at an alarming rate which effect on many parts of the world.

Dr. Rajendra k Pachauri, an economist , environmental scientist, the chairman of inter governmental Panel on Climate Change and director General of TATA energy research institute, pointed out the impact of climate change and in his speech at the Nobel Prize acceptance awards ceremony in Oslo, Norway on December 11, 2007, which was published in SPAN, March-Apr-

2008, he says: "The impacts of climate change on some of the poorest and most vulnerable communities in the world could prove extremely unsetting. And given the inadequacy of capacity economic strength, and institutional capabilities' characterizing some of these communities, a decline in their economic condition, with a loss of livelihood and opportunities to maintain even subsistence levels of existence.... As for as security of human settlements is concerned, vulnerabilities to climate change are generally greater in certain high-risk locations, particularly coastal and riverine areas, and areas whose economies are closely linked with climate- sensitive resources".

The impact of climate change is on various factors of Nature. Neglect in caring our heritage of natural resources proves extremely destructive for the human race and for all species on the earth. The impact of climate change is more dangerous to the world's poorest nations, especially Asia and Africa. As well as its impact is on biodiversity, health, status, human settlement.

Responsible Factors for Global Warming

It is happened cause of man's insensitive activities like the smoke produce by burning plastic wastage and by care. The use of room fresheners, deodorants, aerosols foaming agents, AC, refrigerants and others has CFC in them. Green house gases are the main reason behind global warming, which gases are naturally present in the atmosphere but human process makes them more fatal. Deforestation is another reason to increase greenhouse gases because trees help to maintain the water cycle as well as reduce the large amount of carbon dioxide. Rising industrialism from 1950's a large share of green house gases. Industries like manufacturing chemical's and metal plants, power station, transportation, waste disposal. And treatments have a large share of green house gases production. These are responsible factors for increasing global warming. Other hazards are contamination and desertification, the unchecked growth of human population the threat of nuclear warfare, garbage disposal, household sewage, industrial wastewater. It has damaged the fragile web of nature. The Global warming harms the biosphere and human life in alarming proportions.

The Impact of Global Warming on Human Development

Over all discussion shows that at present the modern man has failed to create harmonious relationship with nature. The recent history of human has become the history of greed, exploitation, arrogance and destruction. Man's so called superior intelligence has led him to greed, arrogance and egoism. It led him to assume that this planet earth is only to serve his need only. As a result we have reached at the edge of doom. Man's insensitive activities have

completely damaged the basic life support systems of Earth. It has affected the globe climate. The most powerful effect and the global climate warming have damaged the ozone layer. Human health is affected by the climate change. It brings out the changes in water, air, food quality and ecosystem. These effects may not be fatal for now but they can be worse in long run. It damages to agriculture due to irregular rain and sudden changes in weather causing the farming yield low quality of crops.

Understanding these dangerous effects of Global warming at the international level measures are taken in the form of conferences, summit, agreements and research studies. Many literary scholars also feel the need to write about earth and life supporting system. The global warming is largely of our own making or a byproduct of culture. Donald Worster, the renowned historian, explains that humanities scholars have an important role to play : "We are facing a global crisis today, not because of how ecosystems function but rather because of how our ethical systems function, getting through the crisis requires understanding our impact on nature as precisely as possible. Even more, it requires understanding those ethical systems and using that understanding to reform them. Historians, along with literary scholars, anthropologists and philosophers, cannot do the reforming of course but they can help with the understanding,'' (Worster, 1993:27).

Role of Eco Criticism and Global Warming

Realizing the impact of global warming, we have to rectify our ways to nature before the doom's day dawn. The literary artists understand the urgent need and focus their attention to preserve nature, proclaiming their slogans as 'our planet is not lost; 'not man but earth first'. The sub- canon of literature is Literature of the environment or ecoconscious literature. The movement arose from the social concerns of teachers and students as have sprung up the other critical movements in literary studies over the last forty years. The role of literature in environmental studies has become very crucial in the present times due to the emergence of the critical mode of ecocriticism.

Ecocriticism is a new, emerging field and quite a recent phenomenon in the world of literature. Ecocriticism is an academic discipline which began in earnest in the 1990s, although its roots go back to the late 1970s. It is a new area of study; scholars are still engaged in defining the scope and aims of the subject. The term "ecocriticism" was coined in 1978 by William Rueckert in his essay Literature and Ecology: An Experiment in Ecocriticism. According to Rueckert, ecocriticism means "the application of ecology and its concept to the study of

Literature". (Rueckert, 1996: 71-86) His definition is concerned specifically with the science of ecology, which includes all possible relations between literature and the physical world.

Cheryll Glotfelty one of the pioneers in the field she defines ecocriticism in her Introduction to the Ecocriticism Reader, as "the study of the relationship between literature and the physical environment". (Glotfelty, 1996: xviii) and Laurence Buell says that this study must be "conducted in a spirit of commitment to environmentalist praxis." David Mazel declares it is the analysis of literature "as though nature mattered." This study, it is argued, cannot be performed without a keen understanding of the environmental crises of modern times and thus must inform personal and political actions. It is, in a sense, a form of activism. Many critics also emphasize the interdisciplinary nature of the enquiry, which is informed by ecological science, politics, ethics, women's studies, Native American studies, and history, among other academic fields. Simply speaking, Ecocriticism is the study of representation of nature in literary works and of the relationship between literature and the environment. This study is interdisciplinary in its point of view where all sciences come together to analyze and brainstorm possible solutions for the correction of contemporary environmental situation. A basic definition of ecocriticism was provided by an early anthology. Ecocriticism highlights attitudes to nature in literature and it also focuses on the rethinking of our contemporary ecological problems. Glotfelty summarized in words in what ways has literacy itself affected mankind's relationship to the natural world. Cheryll Glotfelty isolates three main phases in ecocriticism:

1) The study of nature representation in literature
2) Recovery of nature writing texts
3) Analysis of the symbolic construction of species, the discourse that constructs the human and the genders, and develops theoretical frames for reading texts.

The role of literature in environmental studies is very significant known as ecocriticism. Ecocriticism is a new theory introduced in literature. Its aim is to understand the need of environmental study in literature in the present era. It brings out the environmental literacy and awareness in the society through ecoconscious literature.

Conclusion

Global warming has a diverse effect on the ecosystem. Preservation of ecological systems has been an urgent need for the survival of human and non human species. The conservation of nature has always been a prime concern of Environmental literature i.e. Ecocriticism. So the need of collaborative work for environmental literary studies has become imminent. These concerns have now become an important presence in the literary field. Therefore it is essential to

create ecological literacy among all members of the society in order to counter the destructive forces of utilitarianism. Ecology has come to play a central role in our lives in recent years. It has become impossible to talk about man's relation to nature without referring to ecology. The aim of ecocriticism is that human systems must be developed in order to create a resilient and sustainable society. And make sensitive towards nature to create harmonious relationship between human and environment. Environmental philosophers need to rethink the current use of our resources, our relations to other forms of life; and our place within, and our responsibilities towards the ecosystem.

References

- Agarwal, Anil and Narain, Sunita. Global Warming In an unequal world, Centre for Science and Environment, New Delhi. 2003.
- Arun, Neerja, Saraswat, Rakesh. Ecology and Literature Global Perspective. Creative
- Books: New Deli, 2009.
- Buell, Lawrence. The Eco-critical Insurgency, New Literary History, 1999.
- Glotfelty, Cheryll and Fromm eds, The Eco-criticism Reader Landmarks in Literary
- Ecology, University of Georgia press, 1996.
- Rueckert, William. Literature and Ecology: An Experiment in Ecocriticism in R. Glotfelty
- and H. Fromm. ed. 1996.
- Sumathy, S. Eco-criticism in Practice. Sarup Book Publisher Private, 2009.
- Weart, R. Spencer ed. The Discovery of Global Warming Harvard University
- Press, London, 2008.
- Worster, Donald. The Wealth of Nature: Environmental History and Ecological Imagination.
- New York: oxford University Press, 1993.

11. Healthy Life: A Gift from Environment

Dr. Kadwe Smita Krishnarao
K.V.N. Naik Sr. College, Nashik, Botany Dept.

Abstract

pH (Power of Hydrogen) is a logarithmic measure of the acidity or alkalinity of a solution. As blood pH of our body falls, blood becomes acidic. As blood pH increases, blood becomes alkaline. The healthy pH range of human blood in between 7.35 and 7.45. When there is increased in the acid level in the blood fluid of our body, it creates acidosis. The people who suffer from unbalanced pH , are too acidic, so they should study causes, effects and preventives measures of Acidosis.Within shortest possible time, with minimum efforts and without disturbing your daily routine, anyone can maintain our blood pH at 7.4.When we try to balance our blood pH, we will get relief from many problems. We have to change our diet and we have to strictly avoid some food material like sugar, tea, coffee, bakery products and refined oils, then only we will get good health and vitality.

Key Words- pH, Acidosis, Buffer.

Introduction

When we are suffering from any disease, we thought that it could be past karma, it could be a faulty diet and it could also be an imbalanced of Kapha, Pitta and Vat. Thus we have multiple causes, but it is very important to focus on one more important cause- "BLOOD PH". As blood pH falls, blood becomes acidic. As blood pH increases, blood becomes alkaline. Any extreme deviation creates deterioration of health at the cellular level. It may result in various diseases. The metabolism of the body influences balances of blood pH of every second. This is a natural process. pH (Power of Hydrogen) is a logarithmic measure of the acidity or alkalinity of a solution. It is measured on a scale of 0 to 14. If the concentration of H' is more it will lower the pH and solution become more acidic. If the concentration of His less, then it will higher the pH and solution become more alkaline. The healthy pH range of human blood in between 7.35 and 7.45.

Our body continuously strives to maintain the pH balance. The systems which balance the deviation in pH are known as 'Buffers'. There two types of buffers- Chemical and

physiological; in the human body, which are helpful to balance the deviation in pH. When this balance will distributed many problems can occur.

Theory

When there is increased in the acid level in the blood fluid, it is called acidosis. We required food for our daily routine. However, the food which provides us the nutrients, minerals, energy, vitamins and also produces waste products which are highly acidic. Due to this all chemical processes which are taking place in our body we will suffer from acidity.

We have to suffer the problems because of unbalanced pH. The people who suffer from unbalanced pH are too acidic. This condition forces the body to borrow minerals includingpotassium,sodium, magnesium from our vital organs and bones. The body will get long term damage because of this more stress and strain. When it happens, we start losing calcium from our blood, bones and tissues.

Causes of Acidosis

- Our diet which is to high in acid - producing animal products like meat, eggs and too low in alkali producing foods like fresh vegetables and fruits.
- Acid containing processed food like Vanaspati Ghee, Jaggary (Chemical), and Sugar.Acid producing beverages like tea, coffee and soft drinks.
- Protein food containing phosphoric acid liberates Hions and creates acidity.
- Different metabolic processes of our body produces fats, oil generate fatty acids and ketone and create acidity.
- Carbon dioxide which is transported by the blood creates acidity.
- Hydrochloric acid when secreted in stomach liberates Hions and creates acidity, many drugs which are acid forming, which creates acidity in our body.
- Many people uses artificial chemical sweeteners which are extremely acidforming.
- We all uses mosquito repellent, which contain Allethrin. Long term use ofAllethrin belongs to the class of synthetic Parathyroid is very dangerous for our body and causes asthma, corneal damage, and liver damage.
- Presence of insecticides and pesticides in our foods also creates acidity.

Effect of Acidosis

- ❖ All these acid waste is excreted from human body in the form of urine or sweat. But the waste product which is not excreted from our body will keep circulating around in the blood, throughout the body. It will accumulate in our blood capillaries and block them up. Due to this the cells of our body will get less supply of oxygen and essential nutrients. Our cells become inactive in reproduction. That is the main reason why we become old. After the blood vessel blocked, the function of every organ in the human body start to deteriorate and it will result in very serious illness of our body.
- ❖ As the acidity of blood increases, the capacity of red blood cells to carry oxygen decreases. A person may feel chronic fatigue and uneasiness.
- ❖ Acidic sperms could not produce healthy sperms in healthy count. It badly affects the fertility of male.
- ❖ Acidic uterus in female affects the conception and they will suffer infertility problem.
- ❖ If the pH value of urine is within normal range, excess calcium from our body is urinated but when urine becomes acidic it precipitates calcium resulting in the formation of kidney stones. When we try to balance the urine pH, it will help to dissolve kidney stones.
- ❖ Due to acidosis, we may suffer from weight gain, diabetes, cardiovascular damage, immune deficiency, premature aging, osteoporosis, chronic fatigue, infertility, gall stone etc.

Preventive Measures of Acidosis

When we try to balance our blood pH, we will get relief from many problems. We have to change our diet and we have to strictly avoid some food material like sugar, tea, coffee, bakery products and refined oils, then only we will get good health and vitality. Let us take a serious look at certain foods which destroy the health and increases acidosis in our body, when they are consumed.

- **Refined Sugar** - Sugar create burden on the digestive system without providing any nutrition .The process of digestion of sugar destroys vit B and calcium and absorption of ion is related to the presence of vit B. It ultimately leads to anemia. Adrenalin, Thyroid and pituitary gland also affect during the digestion process of the sugar. So avoid the use of sugar is the first step towards good health.

- **Refined oil** - During the process of refining, it involves the use of HCL and NaOH. Both are corrosive in nature and harmful for our body. The refining process destroys precious natural vitamins and minerals present in the oil. So we have to shift to the filtered oil instead of refined oil.
- **Hydrogenated vegetable oil**- The process of hydrogenation involves use of dangerous chemical like HCL and NaOH. So natural vitamins and minerals are destroyed. This may result in the various disorders like cancer, diabetes, obesity, infertility.
- **Bakery products**- All the bakery products are processed in hydrogenated vegetable oil and sugar. No amount of nutrition is present, which destroys our health and vitality. The process "Hydrogenation' increases H' in the oil in the presence of nickel electrodes to make vanaspati ghee. The traces of nickel remain in it. It is very harmful for our liver.
- **Tea and Coffee** - The tannin contained in the tea converts absorbable ferrous iron (Fe**) available in our food to non-absorbable ferric irons ((Fe). So it would be extremely difficult to improve the Hb count in blood resulting in chronic fatigue and weakness. Tannic acid in tea contributes to hardening of blood vessels and tissues.

We have to avoid pickle, papad, food colours and preservatives also to maintain blood pH.

Conclusion

Lastly it concludes that within the shortest possible time, with minimum efforts and without disturbing your daily routine, anyone can maintain our blood at 7.4 and can enjoy healthy life. It will help to maintain fitness for all, rich or poor across the country also. So all are blessed with good health, wealth and peace.

We have to eat vegetables and fruits also. All sprouts having alkali ph. So we should increase the use of sprouts.

Refferences

- Health and Vitality by Madhav Joshi
- Natural hyperacidity: Preventive measures
- Seven point four by Madhav Joshi
- Avoid Foods Trigger Acid Reflux Problems

12. Heavy Metals in Agricultural Soil in and Around Nandurbar District (M.S.)

Dr. N. S. Sonawane
Dept. of Chemistry, B.S.S.P.M.s Arts, Comm. & Sci. College, Songir, Tal. & Dist. Dhule.
Dr. R. V. Patil
Dept. of Chemistry, GET's, Arts, Comm. & Sci. College, Nagaon, Tal. & Dist.Dhule.
Dr. V. B. Jadhav
Dept. of Chemistry - Z.B. Patil Collge, Dhule.
Mr.K. M. Borse
Dept. of Chemistry - S.S.V.P.S. Science College, Dhule.

Abstract

The heavy metal contamination from both natural (Geogenic) and anthropogenic sources has increased concern about living in urban environment who are more likely to be exposed to this threat. Natural and anthropogenic sources of soil contamination are widely spread and variable (Tahir et al, 2007). Heavy metals occur naturally in rocks. But most of the heavy metal occurrences in urban soil tend to originate from anthropogenic sources such as industrial, urban development and transport activities (Lee et. al, 2007).

Key Words: - ICP-AES, soil samples, heavy metals etc.

Introduction

Soil & water is vital natural resources which is essential for multiplicity of purposes. It's many uses include drinking and other domestic uses, industrial cooling, power generation, agriculture (irrigation), transportation and waste disposal. "Soil & water contamination by variety of chemical substances or eutrophication caused by several nutrients and fertilizers (south wick, 1976)."

Excessive level of trace metal may occur naturally as result of normal geological phenomena such as ore formation. Weathering of rocks leaching ore, in case of Zn, Cu and Pb May make these metals available to the biosphere. Man releases more of the metals by burning fossil fuels, mining, smeliting, discharging industrial, agricultural and domestic waste. Mainly three types of soil are observed in the Nandurbar district i.e. coarse shallow soils, medium deep soils and deep black soils, the soils of district are basically derived from deccan trap basalt to the south of Tapi river. The seriousness of heavy metal contamination is further compounded by the

fact that they are generally water soluble no degradable vigorous, oxidizing agent and are strongly bonded many biochemical inhibiting there function.

Trace element usually classified as essential to man iodine, iron, zinc, copper, (WHO 1996). The uptake and utilization of essential trace element are under physiological control and well balanced diet is usually adequate in order to maintain trace element homeostasis. (Lentner, 1986). For some essential trace elements, excess and the difference between essential and toxic intake levels may be small (Nord, 1995).

Interest in soil and water analysis is due to enormous importance of water to all categories of living thing. It is necessary for the healthy development of man animals and plants (Abulude et al, 2007). Soil plays an important role in bodily intake of true element by human. Even though some trace elements are essential to man, at elevated levels, essential and non essential elements can cause morphological abnormalities: reduced growth increase mortality and mutagenic effect (Aselolu et al, 2002).

Heavy metal can enter a water supply by industrial and consumer waste, or even from acidic rain, breaking down soils and releasing heavy metals into streams, rivers, lakes and ground water. The concentration of this heavy metal in soil and water may be traced to bed rock from which the sediments were derived through which the water flows (Ergin et al, 1991).

Material and Method

Soil samples from the selected sides were collected in and around Nandurbar District and were dried at 105^0C to constant Wight and extract with 5ml conc. Nitric acid, 2ml hydrochloric acid. This digested samples were analyzed for ICP and AES method.

In the present study the soil samples were collected from in and around Nandurbar district and analyzed for the concentration of metals i.e. Copper, Zinc and Lead by ICP AES Method.

Result and Discussion

Copper (Cu)

Copper is necessary for the activity of cytochromes, catalysis, tyrosine's, Monoamino oxidase are needed for normal synthesis of hemoglobin. Daily requirement for adult 2.5 mg; infants and children 0.05mg/kg body wt. excessive deposition of copper in liver and kidney causes hepatic cirrhosis and renal tubular damage respectively. Poisoning by copper salts causes diarrhea with blush green stools.

During the present study the concentration of copper in soil sample was observed in the range 0f 1.247 to 2.265 ppm.

Zinc (Zn)

Zinc is very essential micronutrient in human beings and only at very high concentration it may cause some toxic effects. But heavy dose cause rental damage and cramps. Zinc compounds are as tringents, corrosive to skin, eyes and mulous mebranes. They cause a special type of dermatitis known as 'Zinc Fox'. Zinc is also irritating to the digestine tract causing nausia and vomiting. In present study concentration of Zn in soil sample was found to be in the range of 0.497 to 0.774 ppm.

Lead (Pb)

Lead occurs 15.0 ppm in earth crust in sea water 5.0 ppb lead is present. It is found in all living organisms. Thus it is distributed in food and the environment. A human body contains about 120mg. pb, 96% in the bones. The concentration of pb increase with age and it may reach to limit of 400 mg. it is hot essential for mammals. (Kudesia et. al 2007)

Lead poisoning includes abdominal pain, anemia and lesions of central and peripheral nervous systems. The principal biochemical effect of pb in toxiciation in humans and animals is defective hemoglobin synthesis. In advanced pb poisoning synthesis of globins' moiety of hemoglobin is also inhibited (SVS Rana et. al, 2011).

In present work concentration of lead (Pb) was found to be in the range of 0.067 to 0.522 ppm.

Table - Heavy Metal Concentration in Soil Samples (BM)

Sample	Cu (ppm)	Zn (ppm)	Pb (ppm)
SS1	2.265	0.774	0.522
SS2	1.825	0.632	0.087
SS3	1.247	0.497	0.076
SS4	1.805	0.637	0.087
SS5	1.634	0.604	0.067

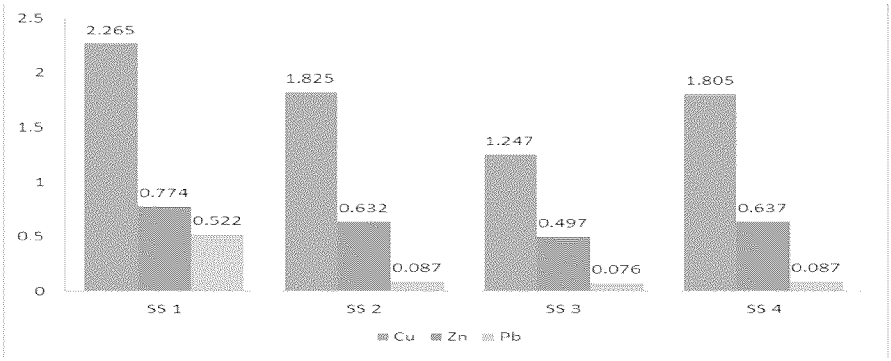


Fig. Concentration of Heavy Metal in Soil Samples (BM)

Conclusion

Elevated values of Cu, Zn & Pb found in soil on location at the selected areas. No evidence of elevated values of Zn in soil was found however it was found that 'Cu' generally has highest concentration in the soil. The concentration of 'Zn' and 'Pb' in soil as obtained in study area was found to be permissible limit according to WHO (2004).

Acknowledgement

The authors are thankful to Head SAIF IIT Powai Mumbai for ICP AES Facilities, The principal G.T.P. College, Nandurbar and The Principal Arts, Commerce's & Science College, Songir, Dist. Dhule (M.S.) for providing necessary laboratory facilities.

References

1) Mumata Tomer, "Quality Assessment of water and wastewater" Lewis Publisher Boca Ratan (1999).
2) Chandra S.V., "Toxic metal in environment "Published by Industrial Toxicology Research Center Luknow. WHO Guidline for drinking water, Recommendations Geneva, Switzerland Vol. 1130 (1984).
3) Naveen Kumar Singh, " Quality of drinking water in relation to Human health in Dabra municipal area". Current world Environ. Vol.2(1) 47-49 (2007).
4) Singh D.K. and Lal Jyosna " Removal of toxic heavy metal ion from Waste water by coal based adsorbent" Pollution Research 11pp 37-42 (1992)
5) EPA water quality criteria for zinc 440/5-80-79 EPA (1980).
6) Kataria H.C. Analytical study fo trace element in ground water of Bhopal Prof. 24 (12) 894-896- (2006).
7) De, A.K. Environment Chamistry (7^{th} edn) New Age international publishers New Deilhi, 2010.
8) A. Mishra, and K.S.Pitre, (2005), J.Indian chem.. Soc; 82 (3) : 265.
9) R.Reza, G.Singh (2010) Heavy metal concentration and its indexing approach for river water. Int., J.Environ Sci. Tech. 7 (4) 785-792.

13. Human Capital Development-Challenges and Necessities

Padmavati Basavarajappa Suganoor
KBH Institute of Management & Research, Malegaon, Dist: Nasik.

Abstract

In the growing competition among the industries, corporations and in agricultural and service sectors utilization of human capital has become a challenge for every HR manager. The "storm" for development consists of multiple and varied factors that are increasing in pace and importance, such as evolving technology, demographic changes, and globalization of business. More importantly, these rapidly changing trends are occurring while organizations work to stay ahead of their competitors and rethink how they will move their businesses forward. Although these evolving trends may seem overwhelming, organizations cannot afford to ignore them. They are not going away, and how an organization tackles them could be the difference between its success and its demise—across global areas, industries, and competitive markets. This paper tries to review the challenges ahead for the HR managers for proper development of human capital.

Key words: Human capital, technology, demographic changes, globalization, demise, retention.

Introduction

Recruiters know that success in business relies on a talented workforce. Human capital challenges specifically find out which human capital issues are considered most important now. It will be crucial for recruiters and their HR leaders to convey the urgency of these human capital challenges to their colleagues. There is a perfect storm brewing globally and nationally with workplace implications, particularly over the next decade and beyond. The "storm" consists of multiple and varied factors that are increasing in pace and importance, such as evolving technology, demographic changes, and globalization of business. More importantly, these rapidly changing trends are occurring while organizations work to stay ahead of their competitors and rethink how they will move their businesses forward. The alignment HR needs to drive is between individual capabilities and what the role in an organization those capabilities can solve for. The problem is organizations try to align those capabilities with job titles and

functions. The difference between the function and what it solves for is the difference between human resources and human capital. That's why the term human capital is so important. Human capital is how people contribute to growth. It is about allowing the individual to influence more. The individual needs to define the business – and thus should define the work that HR does.

HR can't just be a compliance cop protecting the company from those pesky employees. It must empower employees who want to help grow the company and evolve to achieve their goals, too. In addition, HR can't just be about data either. Not everything human can be optimized through data – and looking at the data is no replacement for having insight and listening to people.

That's what's getting lost in all these discussions of HR: people. Humans, like employees, are a group – a species if you will. Something to be studied, controlled, defined. People are individuals. We can't forget about the people.

From the Indian perspective there is high amount of human capital attrition to western & gulf countries due to negligence of Indian industries or industrial expectations are more from this human capital. Secondly there is high respect and money in the western &gulf nations. Today it is high time we think of developing talented human capital.

Review of Literature

There are various writers who have worked on human capital development as seen below .Integrative Literature Review: Human Capital Planning: A Review of Literature and implications for Human Resource Development by Kenneth J. Zula& Thomas J. Chermack where they stated that the shift in the U.S. economy from a manufacturing powerhouse to a service-driven economy has placed a great emphasis on human capital planning within organizations in order to remain competitive in a new global economy. The link between critical business strategy and the successful implementation of strategy has been well documented in the literature. This article examines the literature surrounding human capital, human capital planning, and the implications for human resource development (HRD). The results of the review and synthesis of the literature are provided, and the implications for HRD scholars and practitioners are reported in detail. The research reports an in-depth justification and rationale for the incorporation of human capital planning into practice and research to determine the impact on HRD interventions and organizational performance through the use of a model and process for human capital planning. According to GS Becker Human Capital is not like physical or

financial capital but it is because you cannot separate a person from his or her knowledge, skills, health, or values and further she says that financial or physical capitals can be separated or distributed while human capital can be developed and utilized. There are various writers like R.Vennikar ,JE Rauch, J Mincher have all worked on human capital development through education, training and involvement.

Human Capital

Human capital can be defined as 'the knowledge, skills and competencies embodied in individuals that facilitate the creation of personal, social and economic well-being.'[OECD].

Factors of Human Capital Development

Human capital is considered to be one of the most important elements of company success. The process of developing human capital requires creating the necessary environments in which employees can learn better and apply innovative ideas, acquire new competencies, develop skills, behaviors and attitudes. The concept of human capital development is quite recent. In the past, employers were not generally investing in widespread, formal employee training and development. Executive development was expected to be done in-house, either by rising slowly through the management ranks or by moving to another company. Certainly it was not usually achieved via an executive training program or executive development program. Even the concept of "human capital" is relatively new. But rising demand for an increasingly skilled workforce, combined with a growing trend of people moving from company to company, has made corporate investment in human capital development more appealing. Management training courses are perhaps the oldest form of human capital development. These first appeared in the post-WWII era, when business academics studying the new multi-national companies realized they had developed complex organizational structures that would require bespoke training courses in organizational development and organizational management.

Human capital development through corporate training is an essential function of the human resources department. This is due to the following reasons:

- It allows companies to develop leaders within the business organization.
- It increases employee satisfaction and retention.
- It increases work productivity.
- It allows management functions to be carried out efficiently and effectively.

Top 3 Training Programs for Human Capital Development

1. Executive Development Programs

Executive development programs are usually run by a business school, corporate university or other specialized executive education professionals. Such programs are generally geared to individual executives, although some good business schools offer programs to teams as well.

Many different types of executive development programs are available, focusing on different aspects of human capital development. These include specific functional training and business management programs, as well as general management training courses geared to help executives make successful career transitions. With good leadership skills being increasingly expected at all levels, leadership development programs have also become popular.

2. Professional Coaching and Mentoring

In most instances being delivered on a one-to-one basis, coaching and mentoring is a more personal way for executives and teams to focus on developing specific skill sets, particularly leadership. Executives receive personal feedback during coaching sessions, an effective way of helping people become the very best they can be. Many good executive development programs include coaching as part of the program.

3. Company-Specific Programs

Good business schools and corporate universities also provide custom programs that address specific company challenges as well as drive human capital development in a strategic, company-wide manner. These human resource management programs are based on case studies on the human resource policies, situation and challenges of an existing company.

If a company encourages and aspires to carry out human capital development (HCD), employees are seen as valuable assets with quantifiable value that can be increased through specific and measurable management techniques and human capital development s Almost every company today will state that their employees are their most important and thus valuable asset. In order to adequately develop human capital solutions, employers must continuously invest both time and money in training and recruiting people to fortify their personal and interpersonal skills Solutions. Human capital is considered to be one of the most important elements of company success. The process of developing human capital requires creating the necessary environments in which employees can learn better and apply innovative ideas, acquire new competencies,

develop skills, behaviors and attitudes. Therefore, you can state that human capital development revolves around:

- Talent management
- Change management
- Performance management
- HR management
- Learning and development
- Succession planning
- Strategic planning
- Workforce planning
- Knowledge planning

Human Capital Development Tools

The tools for creating these opportunities mostly include training, facilitation, coaching and consulting. The emphasis lies on meeting the needs of learner and organization alike. Some companies use learning management systems to help develop their human capital development.

Relation with Knowledge Economy

Companies and brands all over the world are strategically planning and positioning their internal productive resources so they can thrive successfully in the global knowledge economy. The growing importance of knowledge, as opposed to the traditional factors of production, is changing the nature of economic exchange everywhere in the world. The organizations that are able to master the production of knowledge and its conversion to tradable goods and services are topping the charts of economic growth and success. But the knowledge economy is also related to human capital development simply because human beings are knowledge carriers. As human capital can be defined as an engine for business growth, the success of any company depends on its ability to develop, organize and use its human capital.

Conclusion

The importance of human capital is that it gives following importances.

- **Structural Unemployment:** Individuals whose human capital is inappropriate for modern employers may struggle to gain employment. A major issue in modern economies is that rapid deindustrialisation has left many manual workers, struggling to thrive in a very different labour market.

- **Quality of Employment:** In the modern economy, there is increasing divergence between low-skilled, low-paid temporary jobs (gig economy). High-skilled and creative workers have increased opportunities for self-employment or good employment contracts.
- **Economic Growth and Productivity:** Long-term economic growth depends increasingly on improvements in human capital. Better educated, innovative and creative workforce can help increase labour productivity and economic growth.
- **Human Capital Flight:** An era of globalisation and greater movement of workers has enabled skilled workers to move from low-income countries to higher income countries. This can have adverse effects for developing economies that lose their best human capital.
- **Limited Raw Materials:** Economic growth in countries with limited natural resources, e.g. Japan, Taiwan and South East Asia rely on high-skilled, innovative workforce adding value to raw materials in the manufacturing process.
- **Sustainability:** "What we leave to future generations; whether we leave enough resources, of all kinds, to provide them with the opportunities at least as large as the ones we have had ourselves".

So it is necessary that our country also implements systematic development programs to overcome the large amount of human capital attrition to western & gulf countries.

References

1. Claudia Goldin, Department of Economics Harvard University and National Bureau of Economic Research. "Human Capital" (PDF).
2. Gibbons, Robert; Waldman, Michael (May 2004). "Task-Specific Human Capital". American Economic Review. **94**(2): 203–207
3. Gibbons, Robert; Waldman, Michael (2006-01-01). "Enriching a Theory of Wage and Promotion Dynamics inside Firms". Journal of Labor Economics
4. Pigou, Arthur Cecil (1928). A Study in Public Finance. London: Macmillan. p. 29.
5. Mincer, Jacob Studies in Human Capital. 1. "Investment in Human Capital and Personal Income Distribution". Edward Elgar Publishing, 1993.
6. Hanushek, Eric; Woessmann, Ludger (2008). "The Role of Cognitive Skills in Economic Development" (PDF). Journal of Economic Literature.

7. Rindermann, Heiner (March 2008). "Relevance of education and intelligence at the national level for the economic welfare of people". Intelligence
8. Smith, Adam: An Inquiry into the Nature And Causes of the Wealth of Nations Book 2 – Of the Nature, Accumulation, and Employment of Stock; Published 1776.
9. Simkovic, Michael (2013). "Risk-Based Student Loans". Washington and Lee Law Review. .
10. Spence, Michael (1973). "Job Market Signaling". Quarterly Journal of Economics
11. Spence, Michael (2002). "Signaling in Retrospect and the Informational Structure of Markets" (PDF). American Economic Review
12. The Forms of Capital: English version published 1986 in J.G. Richardson's Handbook for Theory and Research for the Sociology of Education, pp. 241–258.
13. "Who Makes It? Clark's Sector Model for US Economy 1850–2009". Retrieved 29 December 2011.
14. "Archived copy". Archived from the original on 2013-02-16.

14. Impact of Climate Change on Waterborne Diseases

C.V. Wankhede
Dept. of Zoology, Arts and Science College, Bhalod, Tal. Yawal, Dist. Jalgaon.

Abstract

Change in climate and water cycle will challenge water availability but it will also increase the exposure to unsafe water. Floods, droughts, heavy storms, changes in rain pattern, increase of temperature and sea level, they all show an increasing trend worldwide and will affect biological, physical and chemical components of water through different paths thus enhancing the risk of waterborne diseases. This paper is intended, through reviewing the available literature, to highlight environmental changes and critical situations caused by floods, drought and warmer temperature that will lead to an increase of exposure to water related pathogens, chemical hazards and cyanotoxins. The final aim is provide knowledge-based elements for more focused adaptation measures.

Keywords: Climate change, waterborne diseases, microbial pathogens, chemical contaminants, toxic cyanobacteria.

Introduction

Although several studies show the vulnerability of human health to climate change, a clear comprehensive quantification of the increased health risks attributable to climate change is lacking. Even more complicated are assessments of adaptation measures for this sector. We discuss the impact of climate change on diarrhoea as a representative of a waterborne infectious disease affecting human health in the Ganges basin of northern India. A conceptual framework is presented for climate exposure response relationships based on studies from different countries, as empirical studies and appropriate epidemiological data sets for India are lacking. Four climate variables are included: temperature, increased precipitation, decreased precipitation/droughts and relative humidity. Applying the conceptual framework to the latest regional climate projections for northern India shows increases between present and future (2040s), varying spatially from no change to an increase of 21% in diarrhoea incidences, with 13.1% increase on average for the Ganges basin. We discuss three types of measures against diarrhoeal disease: reactive actions, preventive actions and national policy options. Preventive actions have the potential to

counterbalance this expected increase. However, given the limited progress in reducing incidences over the past decade consorted actions and effective implementation and integration of existing policies are needed.

Climate Change and Health in India

The effect of climate change on human health in India is a broad topic, covering areas from extreme weather events to shifts in vector-borne diseases. Floods create conducive environments for numerous health consequences resulting from disease transmission. For example, if floodwaters become contaminated with human or animal waste, the rate of faecal-oral disease transmission might increase, allowing diarrhoeal disease and other bacterial and viral illnesses to flourish. Faecal-oral transmission of diseases is of particular concern in regions such as South Asia because of limited access to clean water and sanitation.

In developed countries, flood control efforts, sanitation infrastructure, and surveillance activities to detect and control outbreaks minimize disease risks caused from flooding. In developing countries, increase in diarrhoeal disease, cholera, dysentery, and typhoid is of specific concern .Flooding can also contribute to increased vector-and rodent-borne and other infectious diseases. For example, collections of stagnant water provide breeding grounds for mosquitoes, potentially aiding in the spread of malaria. Other studies have linked flooding in Bangladesh and parts of India with outbreaks of rotavirus and leptospirosis

Rising sea-surface temperatures are expected to increase tropical cyclone intensity and the height of storm surges. Public health effects of cyclones include diseases and illnesses associated with the loss of clean water, hygiene, and sanitation, loss of shelter and belongings, population displacement, toxic exposures, and hunger and malnutrition risk due to food scarcity.

Water-Borne Diseases

Waterborne diseases are caused by a variety of microorganisms, biotoxins, and toxic contaminants, which lead to devastating illnesses such as cholera, schistosomiasis and other gastrointestinal problems. Outbreaks of waterborne diseases often occur after a severe precipitation event (rainfall, snowfall). Because climate change increases the severity and frequency of some major precipitation events, communities especially in the developing worldcould be faced with elevated disease burden from waterborne diseases. In addition, diseases caused by Vibrio bacteria such as cholera and other intestinal diseases may pose a greater threat due to the effect that rising sea temperatures will have on the growth and spread of

bacteria. Climate change is likely to increase diarrheal disease incidence worldwide, and extreme weather conditions may also complicate already-inadequate prevention efforts. Although the United States has prevention and treatment strategies for waterborne diseases, surveillance is still spotty, diagnoses are not uniform, and understanding of the impact of climate change on these diseases is not well established.

A warmer climate could cause water-borne diseases to become more frequent, including cholera and diarrhoeal diseases such as giardiasis, salmonellosis, and cryptosporidiosis (Hales et al., 2003). Diarrhoeal diseases are already a major cause of morbidity and mortality in South Asia, particularly among children. It is estimated that one-quarter of childhood deaths in South Asia are due to diarrhoeal diseases. As rising ambient temperatures increase, bacterial survival time and proliferation and thus the incidence of diarrhoeal diseases might further increase.

Diarrhoeal diseases are largely attributable to unsafe drinking water and lack of basic sanitation; thus, reductions in the availability of freshwater are likely to increase the incidence of such diseases. Rapid urbanization and industrialization, population growth, and inefficient water use are already causing water shortages in India, Pakistan, Nepal, and Bangladesh. Climate change will exacerbate the lack of available fresh water as annual mean rainfall decreases in many areas.

Cholera is a well-known water-borne diarrhoeal disease that has afflicted humankind since ancient times. Outbreaks of cholera have occurred in India, Bangladesh, and more recently, Latin America and Africa. Molecular techniques have shown that bacteria are now recognized as naturally occurring in aquatic environments. The bacterial population peaks in spring and fall in association with plankton blooms. A relationship has been observed between increase in sea-surface temperature, also associated with plankton blooms in spring and summer.

Vector-Borne and Zoonotic Diseases

Malaria

Malaria is one of the most serious and complex public health problems. About 400-500 million cases of malaria and more than 1 million malaria-related deaths occur globally each year.Several factors have caused the global resurgence of malaria, including changes in temperature, rainfall, humidity, and immunity levels. Some other factors affecting malaria transmission include emergence of insecticide and drug resistance, human population growth and movement, land-use change, and deteriorating public health infrastructure.

In India malaria distribution is expected to expand to higher latitudes and altitudes. Because the relationship between climate and disease distribution is complex, in some areas increasing temperatures may restrict malaria transmission. Reductions in transmission intensity in endemic areas might lead to greater proportions of the population losing immunity, resulting in epidemics in later years.

A case study done by Garg (2009) reports that all of India's population is at risk for contracting malaria except for those in the areas above 1700 m above sea surface. More than 973 million persons are exposed to vector-borne malarial parasites in India, and in 1998 an estimated 577,000 disability adjusted life years (DALYs) were lost due to malaria.

To determine the role of climate change in malaria transmission, research efforts will be required that incorporate a disease surveillance system combining trend analyses from multiple sites to account for local factors. The first useful early warning system for epidemic malaria was implemented in India which has proven that rainfall alone accounted for about 45 per cent of the variation in malaria transmission. By the 2050s, the geographic range of malaria vectors is projected to shift away from central regions toward southwestern and northern States. The duration of the transmission window is likely to widen in northern and western States and shorten in southern States. Malaria is likely to persist in Orissa, West Bengal, and southern parts of Assam. It might shift from central India to the southwestern coastal States (Maharashtra, Kerala, and Karnataka). The northern States might also become prone. The duration of exposure is likely to widen in north and west India, and shorten in south India.

Other Diseases

Climate change might affect other diseases endemic to South Asia. These include mosquito-borne diseases such as chikungunya fever and dengue, parasitic diseases such as Leishmaniasis, lymphatic filariasis and onchocerciasis, and tick-borne diseases, which may exhibit changes in transmission intensity or shifts in their geographical ranges due to the impact of climate on the relevant vector populations. Climatic factors might also influence human plague, a bacterial disease carried by rodents and transmitted by fleas. Temperature and rainfall are important determinants of rodent population abundance and distribution. Combined with the influence of temperature and humidity on flea survival and development, changes in any of these climatic components may result in changes in plague incidence. Murine typhus, a rickettsial disease, is also transmitted by fleas and thus may exhibit similar climate sensitivity.

The activity, abundance, distribution, and ability to transmit viruses are influenced by temperature and precipitation. The first reported outbreak of chikungunya in India was in 1963 in Calcutta (now Kolkata), with transmission continuing until 1973. The virus reemerged in 2005, and has since spread rapidly, with more than one million cases reported - despite no standardized surveillance system for the disease. Dengue has also been a significant problem, with more than 50 dengue outbreaks reported in India since 1960.

Health Impacts

Droughts can cause increased concentrations of effluent pathogens, overwhelming water treatment plants and contaminating surface water. Older water treatment plants are particularly at risk.

Changes in ocean and coastal ecosystems, including changes in pH, nutrient and contaminant runoff, salinity, and water security that can cause degradation of fresh water, particularly in areas where much of the population uses untreated surface water for daily consumption and activities.

Increased frequency of intense extreme weather events can cause flooding of water and sewage treatment facilities, increasing the risk of waterborne diseases.

Indirectly, the lack of water can cause pressure on agricultural productivity, crop failure, malnutrition, starvation, population displacement, and resource conflict.

Changes can occur in the distribution and concentrations of chemical contaminants in coastal and ocean waters through the release of contaminants previously locked in polar ice sheets, or in runoff from coastal and watershed development.

Conclusion

India, being a developing country with high population density, might experience human health effects due to climate change. These effects could be in the form of infectious diseases such as malaria, chikungunya, and water-borne illnesses. Monitoring the spread of infectious diseases will require early warning systems, which have both health and economic benefits. Health care providers will need to address the negative health outcomes associated with climate change in India at the primary level.

It is a fact that the impact of climate change in India will not be uniform. Those of low socio-economic status will likely to be the most affected. It may be expected that if India's economy continues to expand, the status of growing middle class and lower middle class would

present a unique situation. The foremost effect would be seen in improved sanitation levels and living conditions, thereby increasing resilience to infectious diseases.

Research Needs

- Evaluating and monitoring exposures and health risks of chemical contaminants likely to be increasingly released and mobilized due to climate change
- Improving understanding of harmful algal blooms including their initiation, development, and termination, as well as the exact nature of the toxins associated with them
- Understanding how toxins, pathogens, and chemicals in land-based runoff and water overflow interact synergistically and with marine species, especially those important for human consumption, and the potential health risks of changing water quality

References

1. Ali A. Climate change impacts and adaptation assessment in Bangladesh. Climate Res. 1999; 12:109-16.
2. Bhattacharya S, Sharma C, Dhiman RC, Mitra AP. Climate change and malaria in India. Curr Sci. 2006; 90:369-75.
3. Checkley W, Epstein LD, Gilman RH, Figueroa D, Cama RI, Patz JA et al. Effects of El Nino and ambient temperature on hospital admissions for diarrheal diseases in Peruvian children. Lancet. 2000; 355:442-50.
4. Epstein Paul R. Chikungunya fever resurgence and global warming. Am J Trop Med Hyg. 2007; 76:403-4.
5. Ezzati M, Lopez A, Rodgers A, Murray C, editors. 1 and 2. Geneva: World Health Organization. Comparative quantification of health risks: Global and regional burden of disease due to selected major risk factors, 2004.
6. Gage KL, Burkot T, Eisen RJ, Hayes N. Climate and vector-borne diseases. Am J Prev Med. 2008; 35:436-50.
7. Garg A, Dhiman RC, Bhattacharya S, Shukla PR. Development, malaria and adaptation to climate change: A case study from India. Environ Manage. 2009; 43:779-89.
8. Houghton JT, Ding Y, Griggs DJ, Noguer M, van der Linden PJ, Dai X, Maskell K, Johnson CA, editors. Cambridge, United Kingdom: Cambridge University Press; 2001. Intergovernmental Panel on Climate Change (IPCC). Climate change: The scientific

basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change, 2001, 881.

9. Karande S, Bhatt M, Kelkar A, Kulkakrni M, De A, Varaiya A, et al. An observational study to detect leptospirosis in Mumbai, India. Arch Dis Child. 2003; 88:1070-5.
10. Majra JP, Gur A. Climate change and health: Why should India be concerned? Indian J Occup Environ Med. 2009; 13:11-6.
11. Mavalankar D, Shastri P, Raman P. Chikungunya epidemic in India: a major public-health disaster. Lancet Infect Dis. 2007; 7:306-7.
12. Sehgal SC, Sugunan AP, Vijayachari P. Outbreak of leptospirosis after the cyclone in Orissa. Natl Med J India. 2002; 15:22-3.
13. Zaidi AKM, Awasthi S, deSilva HJ. Burden of infectious diseases in South Asia. BMJ. 2004; 328:811-5.

15. Impact of Global Warming on Drought Prone Area in Dhule District

Dr. Suresh C. Ahire
U. P. College, Dahivel Tal. Sakri, Dist. Dhule (M.S.).

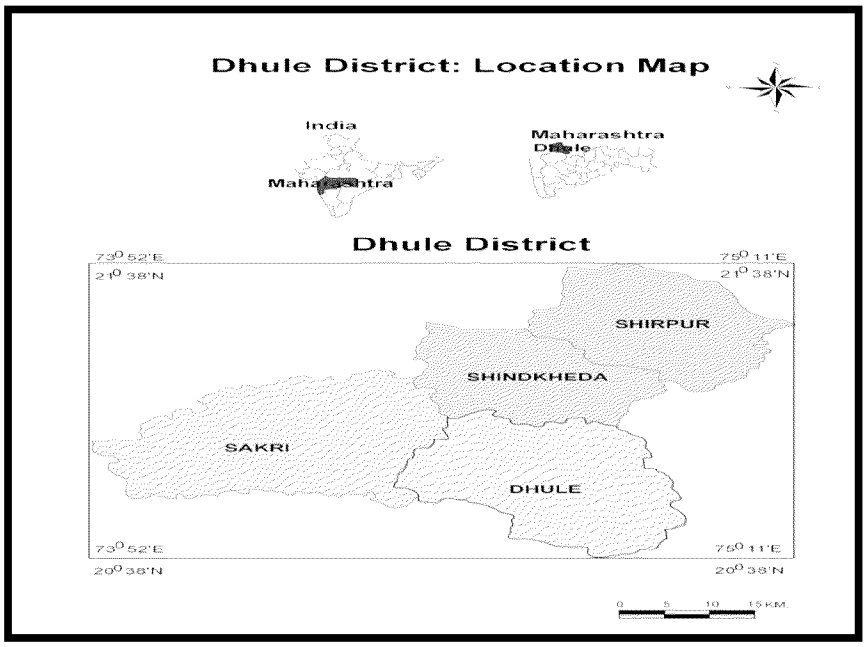
1. Abstract

Dhule district is a drought-prone district. For such a drought-prone area, pomegranate is a boon. This crop requires less quantity of water. Farmers are acquiring the scientific method of applying minimum-water consumption. Economical profits are there in just minimum labour and less expense. So the growth rate of agriculture activity is increasing in less water, follow land and light soil. Agriculture area, income and productivity have been decreasing day by day in the study region. The concentration index methodology of (Bhatia,1965) has been used and with the help of the cultivation, the study region is selected. In accordance with the 'Concentration Index' of Bhatia, after Nashik and Solapur, Dhule is lowof agriculture activity. The concentration Index of Dhule district indicated a large temporal change from 1.88 in 1991 to 0.91 2001. Present work tries to contribute by providing comprehensive outline of global warming factors spatio-temporal distribution at district level. The fundamental objective of the study is the to study the impact of Global warming factors on Agriculture in study area. The assess drought prone area of the study area. Agriculture activity wise characteristics and cost, yield, and profit analysis. With the help of primary and secondary data from the various sources of Dhule district.

Kewwords: global warming, drought, agriculture, economical profits

2. Demarcation of the Study Region

The district of Dhule formerly known as west Khandesh, district headquarters since 1960. Lies between 20°38' to 21°23'North latitude and 73°47' to 75°11' East of longitude. It covers an area of 7195 square kilometers. As of 20011 Dhule had a population (2,050,862) of 1,054,031 Males constitute 51.39% of the population and 996,831 females 48.61%. Dhule district is mainly located in to the Panzara and Kan river basin area.



3. Objectives

1. To study the impact of Global warming factors on Agriculture in study area.
2. To assess the drought prone area of the study area.

4. Conclusions

i) Drought Prone Area

In an effort to bring some order to measuring drought, the scientists grouped the definitions into four basic approaches: meteorological, hydrological, agricultural and socioeconomic. The first three categories track drought as a physical phenomenon. The last category deals with drought as a supply and demand problem, through the impacts of water shortfalls. Agricultural drought accounts for the water needs of crops during different growing stages. For instance, not enough moisture at planting may hinder germination, leading to low plant populations and a reduction in yield. Drought is a slow onset, creeping natural hazard and a regular feature of climate which occurs in virtually all regions of the world: it result in serious economic, social and environmental impacts. (Wilhite, 2000)[17]. Indian agriculture is heavily dependent on the climate of India: a favorable southwest summer monsoon is critical in securing water for irrigating Indian crops. In some parts of India, the failure of the monsoons result in water shortages, resulting in below-average crop yields.

The pomegranate is a xerophytes plant i.e. thorny in nature and reduces leaf lamina in drought periods. Its epidermis is multilayered and produces membrane stomata. Therefore, the

tree has the ability to withstand prolonged water stress conditions. It is well known as 'drought tolerant' crop (Patil A.V. and etc. all 2000)[9]. It requires low amount of water, particularly during the summer season when the irrigation potential is low. The farmers found it best to cope with natural disasters like droughts hence growers often call it as a 'Kalpavriksha' of dry lands (Patil and Bachhav 2009)[10]. The farmers could grow it with widely ranging soil characteristics of scarcity areas. Pomegranate fruits is liked and eaten by all types of people i.e. the ordinary as well as the rich people whole of the year. Agricultural activity cultivation can be taken in both light and low quality soil. It requires limited water and fertilizers too. So in comparison with the other expensive fruits the pomegranate cultivation is cheap and it is demanded by the domestic market also at the same time it has the chances of export too. The crop is not prone to weather extremities. It can sustain in as low as 5^0C and as high as 45^0C temperatures and not much affected by heavy rainfall and strong winds. It starts yielding fruits within 18 to 24 months of plantation. But at the same time other fruit crops like grapes usually take more than 4 years period for bearing the fruits. The long shelf life (hard skin of the fruit) enables it to store for long periods and transportation to distant markets. Undoubtedly, it clears that pomegranate is an ideal fruit crop for water scarcity regions.

Table No.1: Drought Prone Area and Villages in Dhule District

Sr. No.	Drought prone Tahsils	No. of villages	Drought prone of area sq. km.	No. of Drought prone villages
1	Dhule	168	1947	166
2	Shindhkheda	141	1280	143
3	Sakri	225	1556	110
Total		534	4783	419

Source: Maharashtra Development Report, Sukhatankar Committee

Fig. No. 1: Tahsilwise Drought Prone Area (Ha.) in Dhule District (2008)

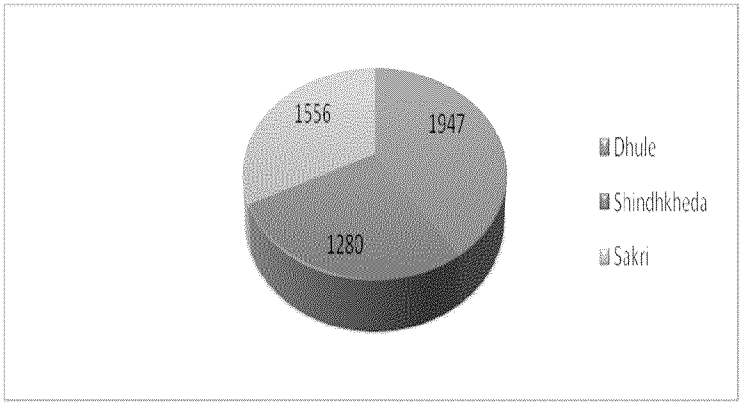
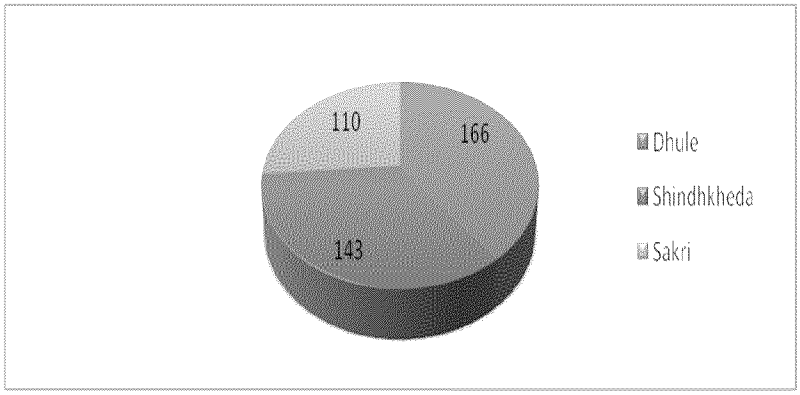


Fig. No. 2: Tahsilwise Drought Prone Villages in Dhule District (2008)



Droughts are natural hazards and are related with rainfall. Drought may be best benefited as persistent and abnormal moisture deficiency that has an adverse impact on agriculture. All the talukas except Shirpur in Dhule district are affected by drought (Sukhatankar Committee, 2005)[15]. Near about 60 percent area of the district is drought prone. The maximum area of Dhule and Shindhkheda comes under the drought prone part. In the western part of Sakri taluka the percentage of rainfall is high. The area is of relief and hilly with slopes. The igneous rock is at the moderate depth under the soil, and the final outcome of this is the water percolates at a very low level. Against this background, it was necessary to understand the water potentials less in study area. So far as the pomegranate farming is concerned it require regular water supply throughout the year to more or less extent. Moreover, the successes of pomegranate farming in drought prone area such as study region solely depend on availability of irrigation water.

ii) Agro Climatic Zone in Dhule District

The major part of the district is agro climaxing which fall under scarcity and assured rainfall zone. The distribution and the characteristic features of agro-climatic zones in the district are as shown below:

a) Scarcity Zone: Scarcity includes eastern part of Sakri and Dhule with Shindhkheda erratic rainfall having 500 mm rain and marked with extreme heat in the month of April-May and cold in Nov. – Dec. The pomegranate tree grows best in this semi-arid belt, where cool winter and hot summer.

Assured rainfall Zone: The assured rainfall zone comprises part of Shirpur taluka with assured rainfall similarly. The annual precipitation varies from 700 to 900 mm, moist or humid weather condition. In context to this the weather elements like temperature, rainfall, humidity and wind are studied in detail as below

16. Impact of Various Types of Gulmohar (Delonix Regia Boj. ex Hook.) Compost on Productivity of Fodder Maize

B. P. Sarwade
Department of Botany, Swami Vivekanand Senior College, Mantha Dist Jalna, (M.S.) India.
G. D. Mule
Department of Microbiology, Swami Vivekanand Senior College,
Mantha Dist Jalna, (M.S.) India.
S. A. Survase
Department of Botany, Lal Bahadur Shastri Mahavidyalaya, Partur, Dist. Jalna.
M. S. Jamdhade
Smt. N.N.C. Arts, Comm. & Science College, Kusumba, Tal & Dist Dhule.

Abstract

Gulmohar (Delonix regia Boj. ex Hook.) belongs to family fabaceae, remains green for ten months in a year and having faster regrowth without maintenance, grows well in tropical and subtropical climate. It is a legume, so gives high nitrogen content. It is planted as an ornamental plant. Beside this, the foliage also can be used for green manuring and preparation of other organic manures.

The aim of the present investigation was to find out the effect of gulmohar compost prepared by aerobic (NADEP) and anaerobic (Bangalore) pit methods on productivity of fodder maize (Zea mays L.). The field experiment was conducted in research farm of Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, during Oct. 2006 – Jan 2007. The experiment was conducted in plots of size 150 x 150 cm with six treatments and four replications. The composts were used as gulmohar vermicompost (GVC), gulmohar compost (GCO), green leaf manure (GLM) and dry leaf manure (DLM) with recommended fertilizer (N120:P80:K40) Kg/ha and absolute control. The fodder maize (Zea mays L.) var. 'African Tall' (Mahalaxmi) produced by Mahendra Hybrid Seeds Co. Ltd., Jalna was sown at a rate of 100 kg/ha. The physiological traits of the crop were noted at 78 days after sowing (DAS).

On the basis of statistical analysis it has been observed that all the values of fresh weight, dry matter, nitrogen, crude protein (Kg/ha) and reducing sugar (Kg/ha) were significant in all the

treatments over CON. The percent increase over control for fresh weight and dry weight (Kg/ha) was found maximum with the fertilization of GLM. The nitrogen efficiency ratio for fresh vegetation was highest in the plots treated with DLM, while in case of dry matter (Kg/ha) was highest in the plots treated with GLM.

Green leaf manure and dry leaf manure prepared from gulmohar foliages are the best, active and cheapest source of plant nutrients working with high efficiency as compared to fertilizer treatment.

Key words: Gulmohar, Compost, Maize.

Introduction

Gulmohar (Delonix regia Boj. ex Hook.) belongs to family fabaceae, remains green for ten months in a year and having faster regrowth without maintenance, grows well in tropical and subtropical climate. It is a legume, so gives high nitrogen content. It is planted as an ornamental plant. Beside this, the foliage also can be used for green manuring and preparation of other organic manures.

Maize is almost an ideal forage crop. It is a quick growing high yielding, palatable and nutritious (Narayanan and Dabadghao, 1972; Relwani, 1979). In India, maize can be grown in wide range of climatic conditions. Different varieties of maize take from 60 to 90 days to harvest for fodder. The crop can be fed to cattle safely at any stage of growth. The yield of fresh fodder varies from 157 to 280 quintals per hectare (Narayanan and Dabadghao, 1972). The aim of the present investigation was to find out the effect of gulmohar compost prepared by aerobic (NADEP) and anaerobic (Bangalore) pit methods on productivity of fodder maize (Zea mays L.).

Materials and Methods

Experimental Site and Design

The field experiment was conducted in research farm of Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, during Oct. 2006 – Jan 2007. The experiment was conducted in plots of size 150 x 150 cm with six treatments and four replications. The composts were used as gulmohar vermicompost (GVC), gulmohar compost (GCO), green leaf manure (GLM) and dry leaf manure (DLM) with recommended fertilizer (N120:P80:K40) Kg/ha and absolute control. The fodder maize (Zea mays L.) var. 'African Tall' (Mahalaxmi) produced by Mahendra Hybrid Seeds Co. Ltd., Jalna was sown at a rate of 100 kg/ha. The physiological traits of the crop were noted at 78 days after sowing (DAS).

Collection, Treatments and Plot Size

The fresh vegetation of Gulmohar (Delonix regia Boj. ex Hook.) was collected from the Dr. Babasaheb Ambedkar Marathwada University campus, brought to laboratory and chopped into small pieces (2 to 3 cm) by iron cutter. Equal amount (13333 kg ha^{-1}) of leaf vegetation was used for the preparation of gulmohar vermicompost (GVC), gulmohar compost (GCO), green leaf manure (GLM) and dry leaf manure (DLM). The fresh vegetation of Gulmohar was spread on the hygienic floor and subsequently sprayed with 5 % urea and single super phosphate (SSP) and another lot of fresh vegetation was also sprayed with 5 % dung slurry to enhance the composting process. These pretreated materials were arranged alternately along with well-composted inoculum and soil on each layer in the aerobic tanks and anaerobic pits. Sufficient water was sprinkled in order to maintain the optimal moisture (50 to 70) over the material. The pits were enclosed with dung-mud paste to prevent loss of moisture or heat and allowed to decompose. The trenches were watered whenever the dampness was less than 50. The pits were again irrigated and closed by dung-mud mixture. Finally, amorphous, dark brown, well-fermented composts were obtained. The uniformly mixed samples (100 g) of each treatment were collected immediately from the pits for nutrients analysis.

Chemical Analysis

The chemical analyses were done by adopting standard analytical methods. The chlorophyll contents (a, b and total) were estimated (Arnon, 1949), using 80 % acetone as a solvent for the extraction of pigments. Ash values were obtained by burning the moisture-free samples in a muffle furnace at 600°C for 2 hours and calcium (Ca) Content was calculated by titrating the sample against 0.01 N $KMnO_4$ solution using methyl red as indicator (AOAC, 1995). Nitrogen (N) was estimated by micro-Kjeldahl method after digesting the sample with Conc. H_2SO_4 (Bailey, 1967) and crude protein (CP) was then calculated by multiplying N value with 6.25 as specified by AOAC, (1995). The dry samples were boiled in distilled water, filtered and amount of water soluble reducing sugars was determined in the filtrate by using Folin-wu tubes (Oser, 1979). The amount of phosphorus was measured following Fiske and Subba Rau (1925) as described by Oser (1979). Potassium (K) Content was determined on a flame photometer (model Mediflame- 127) as suggested by Jackson (1973). Taking in to consideration the yield of dry matter and N content in it, total N accumulated by above ground biomass was calculated for each treatment. The amount of extra N accumulated was worked out by

subtracting the amount of N accumulated in control or untreated. With the help of extra N accumulated and that supply with either urea or various compost, the efficiency of nitrogen used by the plants was calculated.

Statistical Analysis

All the results were statistically analyzed using analysis of variance (ANOVA) test and treatment means were compared using the least significant difference (C.D., p = 0.05) which allowed determination of significance between different applications (Mungikar, 1997) .

Results and Discussion

Analysis of Gulmohar Compost

The equal amount of fresh vegetation was used for the Green manure, Dry leaf manure, and for the preparation of Compost and Vermicompost i.e. 13333 Kg ha^{-1}. The analysis of Gulmohar compost as fresh weight per plot, Kg ha^{-1}, DM, N, P, K content, Ash percentage Carbon percentage and C : N ratio respectively, showing the input for the experiment (Table 1).

Table 1. Analysis of Gulmohar Compost

Treatment	Fresh wt total	Fresh wt. Kg ha^{-1}	Dry Matter Kg ha^{-1}	N %	P %	K %	Ash %	C %	C:N
GVC	60.00	16667	10340	0.67	0.53	0.65	39.00	22.50	33.58
GCO	68.00	18889	9858	0.88	0.65	0.52	28.00	16.00	18.18
GLM	48.00	13333	3867	1.50	1.07	0.72	5.50	3.00	2.00
DLM	18.00	13333	4161	1.25	0.55	1.00	6.80	3.95	3.16

GVC = Gulmohar Vermi compost, GCO = Gulmohar compost, GLM = Green leaf manure, DLM = Dry leaf manure

Table 2. Analysis of total aerial biomass of Maize plants (Age of crop: 89 DAS)

Treatment	(Kg ha^{-1})					Mineral content (%)					
	Fr. wt.	DM.	N	TRS		TRS	N	P	K	CP	Ca
GVC	26111	4699	68	205		4.37	1.44	0.99	0.80	9.00	0.25
GCO	25833	4825	70	327		6.77	1.46	0.68	0.40	9.13	0.23
GLM	25278	4762	60	266		5.59	1.25	0.89	0.50	7.81	0.25
DLM	25000	4589	70	307		6.68	1.52	0.84	0.30	9.50	0.24
FER	21944	4183	87	148		3.54	2.08	0.87	0.40	13.00	0.20

CON	11389	2414	30	95		3.93	1.25	0.74	0.40	7.81	0.19
S.E. ±	**2323**	**378**	8	**37**		**0.57**	**0.12**	**0.05**	**0.07**	**0.78**	**0.01**
C.D.(p=0.5%)	**5970**	**971**	20	**96**		**1.46**	**0.31**	**0.13**	**0.18**	**2.00**	**0.03**

All the values are means of four replicates

Analysis of Maize Crop

The average yield of fresh aerial biomass (Kg ha^{-1}) of maize was highest in the plots received with vermicompost amendment followed in order by compost, green leaf manure, dry leaf manure, fertilizer and lowest in control. The dry matter of maize was found maximum in the treatment of GCO, followed in order by GLM, GVC, DLM and FER, while it was lowest in CON. The nitrogen content (Kg ha^{-1}) was found maximum in the treatment of FER, followed in order by DLM, GVC, GLM and GCO, while it was minimum in CON. The total reducing sugar content (Kg ha^{-1}) was observed maximum in the treatment of GCO, followed by DLM, GLM, GVC and FER, while it was found minimum in CON. (Table 2).

Per Cent Increase Over CON and N Efficiency Ratio

The per cent increase over CON for fresh weight was found maximum with the treatment GVC followed in order by GCO, GLM, DLM treatments and minimum in FER applied plots. The per cent increase over CON for dry weight was maximum with the treatment followed by GCO, GLM, GVC, DLM, and minimum in FER (fig. 1), while the nitrogen efficiency ratio for fresh vegetation and dry matter was highest in the plots treated with DLM, followed by GLM , GVC, GCO application and then in FER treatment, where N was supplied through urea given the lowest efficiency (Fig. 2).

All the results are calculated on the dry matter basis and the values are the means of four replicates.

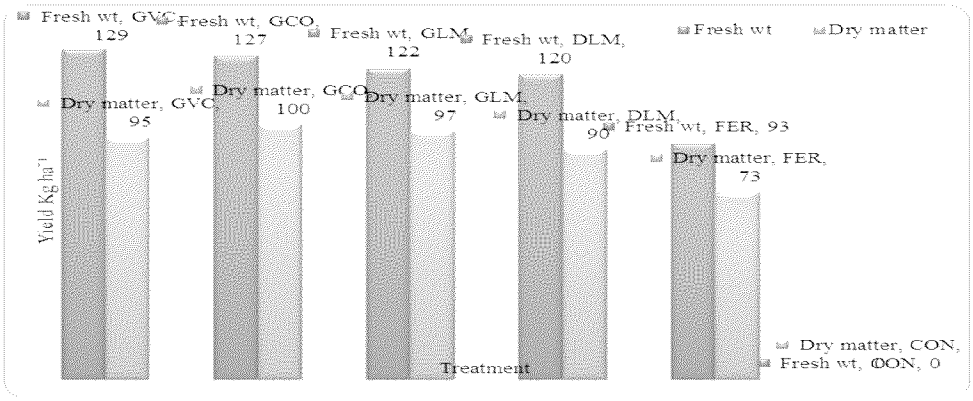


Fig. 1: Per Cent Increase Over Control

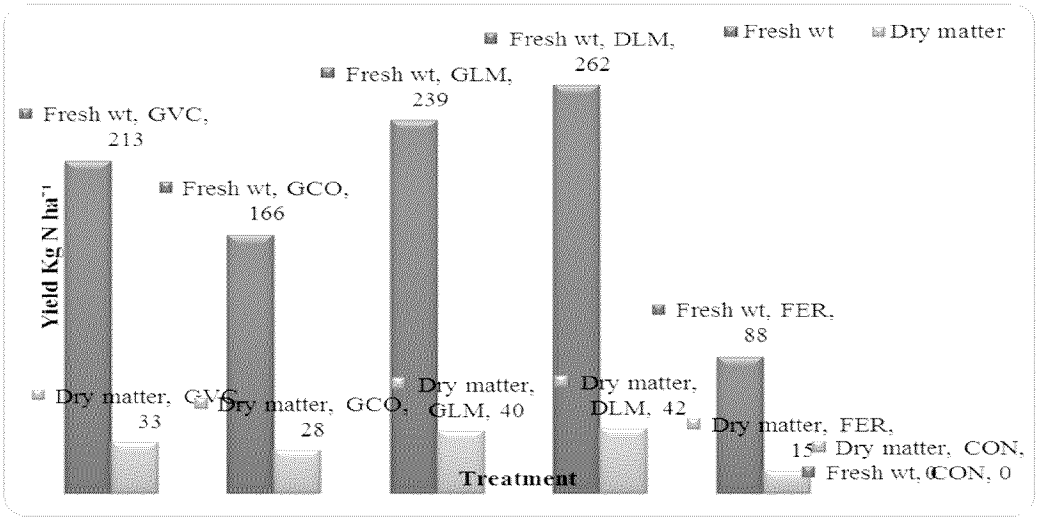


Fig. 2: Nitrogen Efficiency Ratio

Conclusions

The application of vermicompost and compost prepared from gulmohar foliage statistically increased the growth, nutrient uptake and yield of maize.

On the basis of statistical analysis it has been observed that all the values of fresh weight, dry matter, nitrogen, crude protein (Kg/ha) and reducing sugar (Kg/ha) were significant in all the treatments over CON. The percent increase over control for fresh weight and dry weight (Kg/ha) was found maximum with the fertilization of GLM. The nitrogen efficiency ratio for fresh vegetation was highest in the plots treated with DLM, while in case of dry matter (Kg/ha) was highest in the plots treated with GLM.

The use of fresh vegetation and dry leaf manure proved to be the best source of nutrient as compared to the compost and vermicompost. The preparation cost and time for compost and vermicompost will also reduce the nutrient contents by the microorganism which all can be saved by using green manure and dry leaf manure. This green vegetation which is available throughout the year free of cost, having better plant nutrient and best regrowth capacity of vegetation.

Green leaf manure and dry leaf manure prepared from gulmohar foliages are the best, active and cheapest source of plant nutrients working with high efficiency as compared to fertilizer treatment.

References

- **O. A. C.** (1995). "Official Methods of Analytical Chemistry". 16th Ed., Association of Official Analytical Chemists, Washington, DC.
- **Arnon, D. I.** (1949). Copper enzymes in isolated chloroplasts. Polyphenoloxidase in Beta vulgaris. Pl. physiol. **24:** 1 – 15.
- **Bailey, R. L.** (1967). Techniques in Protein Chemistry. II Ed., Elsevier Publishing Co., Amsterdam.
- **Fiske, C. H. and Subba Rau, Y.** (1925). The colorimetric determination of phosphorus. J. Biol. Chem. **66** 375-400.
- **Jackson, M. L.** (1973). "Soil Chemical Analysis". Prentice Hall of India Pvt. Ltd., New Delhi., pp. 134-182.
- **Mungikar, A. M.** (1997). "An Introduction to Biometry". Saraswati Printing Press, Aurangabad. pp. 1 – 97.
- **Narayanan, T. R. and Dabadghao, P. M.** (1972). "Forage crops of India". Indian council of Agricultural research, New Delhi.
- **Oser, B. L.** (1979). "Hawk's Physiological Chemistry". XIV Ed., Tata McGraw Hill Publishing Co. Ltd., New Delhi pp.1115 -1116.
- **Relwani, L. L.** (1979). "Fodder crop and grasses". Indian council of Agricultural research, New Delhi.

17. Indian Politics and Environmental Issues

Prof. Dr. Santosh Shivkumar Khatri
Dept. of Political Science, V.W.S Arts, Com. & Science College, Dhule.

Introduction

The environmental issue is now assuming a dangerous proportion through the world. The need for environmental protection is an area which has been at the forefront of the social concern during last two decades at both national and international level. Over the past few years, the national capital has garnered most attention for environmental issue, compared to other major cities in the country. Therefore in the research paper researcher discuss on what is major environmental issues in India, also discus on the approaches and actual work on ground level of various political parties on that issues. In that concern objectives of research paper are following:

Objectives

1) The study of major environmental issues in India.
2) The study of approaches of political Parties on concern subject.

Environment has become mainstream issue during last four decades. These issues identified Global issue during this period and responsibilities fixed on the nation at the Stockholm, Sweden Conference organized by United Nation. Concern the environmental issue India as a signatory to almost all the major international treaties have enacted a series of national policies and laws during that period. But there is no accountability about the solving that issues and implementation of concern law so that we seen the many major environmental issue in present. Some of the most important environmental issue faced by India is as follows:

1. Growing Population

A population of over thousands of millions is growing at 2.11 per cent every year. It puts considerable pressure on its natural resources and reduces the gains of development.

2. Poverty

India has often been described a rich land with poor people. The poverty and environmental degradation have a nexus between them. The vast majority of our people are directly dependent on the nature resources of the country for their basic needs of food, fuel shelter and fodder. About 40% of our people are still below the poverty line.

3. Agricultural Growth

The people must be acquainted with the methods to sustain and increase agricultural growth with damaging the environment. High yielding varieties have caused soil salinity and damage to physical structure of soil.

4. Need to Ground Water

It is essential of rationalizing the use of groundwater. Factors like community wastes, industrial effluents and chemical fertilizers and pesticides have polluted our surface water and affected quality of the groundwater.

According to NASA groundwater declines are highest on Earth between 2002 and 2008 in northern India. Agricultural productivity is dependent on irrigation. A collapse of agricultural output and severe shortages of potable water may influence 114 million residents in India. In July 2012, about 670 million people or 10% of the world's population lost power blame on the severe drought restricting the power delivered by hydroelectric dams.

5. Development and Forests

Forests serve catchments for the rivers. With increasing demand of water, plan to harness the mighty river through large irrigation projects were made. Certainly, these would submerge forests; displace local people, damage flora and fauna. As such, the dams on the river Narmada, Bhagirathi and elsewhere have become areas of political and scientific debate. Forests in India have been shrinking for several centuries owing to pressures of agriculture and other uses.

6. Land or Soil Pollution

In March 2009, the issue of Uranium poisoning in Punjab attracted press coverage. It was alleged to be caused by ash ponds of thermal power stations, which reportedly lead to severe birth defects in children in the Faridkot and Bhatindadistricts of Punjab. The news reports claimed the uranium levels were more than 60 times the maximum safe limit. In 2012, the Government of India confirmed that the ground water in Malwa belt of Punjab has uranium metal that is 50% above the trace limits set by the United Nations' World Health Organization. Scientific studies, based on over 1000 samples from various sampling points, could not trace the source to fly ash and any sources from thermal power plants or industry as originally alleged. The study also revealed that the uranium concentration in ground water of Malwa district is not 60 times the WHO limits, but only 50% above the WHO limit in 3 locations. This highest concentration found in samples was less than those found naturally in ground waters currently

used for human purposes elsewhere, such as Finland. Research is underway to identify natural or other sources for the uranium.

7. Air and Water Population

Majority of our industrial plants are using out-dated and population technologies and makeshift facilities devoid of any provision of treating their wastes. Many metro cities and industrial area are faced the air and water pollution.

Acts are enforced in the country, but their implement is not so easy. The reason is their implementation needs great resources, technical expertise, political and social will. Again the people are to be made aware of these rules. Their support is indispensable to implement these rules.

Politics on Environmental Issues

As India faces above the major environmental problems, the country's main political parties have all ignored environmental issues. Environmentalists say the mission is alarming given the problems India faces.

The three main national groups competing in the Lok sabha's elections 2013-14 have published manifestos that touch on the environment, but say little about major problems such as worsening pollution or projections that the country will have only half the water supply it needs by 2030. But the major parties discuss water in their manifestos, but not in ways that satisfy environmentalists. Congress and AAP briefly say water should be a legal right, though Congress contradicts that by also discussing water pricing. The BJP is the only party to mention water scarcity predictions in its manifesto, but it proposes expensive solutions.

In the Lok sabha's elections 2013-14 prime ministerial candidate Narendra Modi has campaigned almost exclusively on the issue of corruption in the outgoing government. Most of the corruption scandals in recent years have been over allocation of natural resources, land, water for hydropower and minerals. Still, neither the BJP nor Congress party has much to say in their campaign or their manifesto on how the next government will ensure these resources are used in a manner that is fair, efficient, equitable and sustainable. After the election no one say or make the proper policy about the environmental issue. At the least environmental issue and problem is really a major issue for the country. On that issue some law are making in the constitution but all are on paper. NO one political party, politician is serious about the environmental issue today and public also not aware.

June 2018, in Delhi there was a much publicized citizen protest against the move, with Delhi's residents even going to court. It also resulted in a political slugfest between there major political parties of Delhi. The AAP led Delhi government also had a tiff with BJP led government of India about who allowed the felling of such trees. Though the cutting of trees is on hold for now it is expected to become a point of consideration for at least a section of Delhi's voters.

Green Party Moment and India

Sanjay Kumar, Director at the Centre for the Study of Developing Societies said, India is still at least 20 years away. It will take time for the environment to become an election issue in India. Because in Indian politics water, electricity or even foods are still struggle for many, land up are the major promises of election. That's way the Green party moment are not ripe for the development in India, like Germany, Sweden, Finland and the U.K. But

Conclusion

It is essential to make the public aware of the formidable consequences of the Environmental Degradation, if not retorted and reformative measures undertaken would result in the extinction of life. "The energy and environmental challenges facing the country are so critical that merely playing around with words is unlikely to win elections," Leena Srivastava, executive director of The Energy Research Institute in New Delhi, said politicians have missed an opportunity to connect with voters. Because the political parties and politician discuss on the environmental issues only in election and winter monsoon and on the paper. But in ground level they do not done any work on these issues.

Findings

1) Environmental Concerns in India, like high air pollution or server pollution in water bodies have increasingly been getting the attention of media and citizens, over the past few years.
2) Political parties claim environment protection has always been an integral part of their development plans but there are growing pressure groups of young voters and the middle class who are increasingly forcing political parties to come clean about their stand on environmental issues.
3) The time when elections in India will be fought on environmental issues still seems to be far, Said experts.

Reference

1) https://economictimes.indiatimes.com
2) https://india.mongabay.com/2018/08/06/are-environmental-issues-finally
3) https://journals.openediting.org
4) Ghosh Asish (2007), Environment Issuse and Concerns, A.P.H. Publishing Corporation, New Delhi.
5) Khan T. I (2001), Environmental Policies for sustainable development, Pointer Publisher, Jaipur.
6) Chatterjee Benimadhab (2002), Environmental Lalws, Deep & Deep Publisher, New Delhi.
7) Thethridpole.net, 25.09.2015, 7:12pm
8) Indianexpress.com, Indian Political Parties gloss over environment, published May 9, 2014 12:16pm, (25.09.2015, 7:12pm)

18. Ethnomedicinal Survey of Indigenous Medicinal Plants Used by the Local Tribes of Vaijapur, Chopda, Jalgaon (Maharashtra)

Shaikh Firdos Jamal Shafiuddin
Dept. of Botany, Iqra's H .J. Thim College of Art's & Sci., Mehrun, Jalgaon.

Abstract

The present paper deals with an ethnomedicinal survey of indigenous medicinal plants used by local tribes and rural communities in Vaijapur village of Satpuda hills , Chopda taluka of Jalgaon district . These wild plant species among rural communities managing local forests resources in the vaijapur . The vaijapur village having different tribal communities Bhil, Pawra, and ,Tadvi's. Ethnobotanical information was collected by oral interview with the help of semi structured questionnaire administered to 30-35 elder people in the settlement and herbalist of local area. From the survey total 45 plant species belonging to 25 families were found to be useful in treatment of fever ,cold and cough , headach , asthma, stomach ulcer, malarial fever ,indigestion diarrhea, typhoid , jaundice, swelling rheumatism and skin diseases. The treatment of these ailments were documented as of traditional medicinal plants such as Aloe vera , Argemone mexicana , calotropis procera , Terminalia bellirica etc. used by them. It is therefore implicating that efforts to develop on certification ,conservation and standardization will help to improve tribes 'women livelihoods' status and conservation of natural resources.

Key Words: Ethnomedicinal , Vaijapur , tribes , medicinal plants .

Introduction

Studies on medicinal plants of Jalgaon Taluka are very meager despite of its rich traditional medical practices. As systematic account on medicinal plant of west khandesh has been carried out by Karnik 1966, Yadav & Bhamre 1989, Salunkhe 1995, Yadav & Patil 2001, and Patil 2002 as studies medicinal plants. Jalgaon city is rich in traditional of medicinal plants home to home survey and its surrounding areas reveals interesting information which is encouraging substantial to study on this account. Hence the survey and analyze the potential at what level the herbal medicines are being used the present study has been undertaken.

People utilized traditional herbs because of most of the people believed on Ayurveda & Unani medicines. Since they do not any have side effects. There are many plant species used as herbal medicines all over the world. Therefore now, studies on medicinal plants have become a focal point of studies. The forests are mostly man made or dry scrub jungles except few pockets of natural habitat. Many medicinal plants are found in these areas.

Materials & Methods

Medicinal plants were collected from surrounding areas and nearby forests area of Vaijapur . The methods of preparation of medicines plant and dosage to be given to the patients were recorded from the villagers women old peoples of tribals, traditional medicine men, which are practicing these since long period of time. The various methods of administration are paste, powder, decoction, cold infusion, juice extract, pills oils etc. all the information collected is noted.

Results & Discussion

From above study it was concluded that many plants and even plant parts are used to cure single disease or multiple diseases. Whole plant or its parts is used as medicine. Plant parts used for preparation of medicines are mostly root, stem, leaf, rhizome, bark ,flower and fruits. Mode of administration is also interesting and it can be seems that common methods of administration is oral followed by external and internal application. The dosage is in the form of decoction infusion, extract, powder, pills and oils. The commonly used home remedies are for cold, cough, asthma and bronchitis, body pains, fevers and pneumonia, stomach ache ladies problems etc.

References

- Malhotra S.K. & Mitra 1973 some useful medicinal plants of Chandrapur.
- Patil S.H. 2002 studies on Traditional medicines and health care among tribal communities in Satpuda Ph. D. Thesis North Maharashtra University Jalgaon.
- Yadav S. S. and Bhamre P.B. 1989 Ethenomedico botanical studies of Dhule forest in Maharashtra state.
- Yadav S. S. and S.H. Patil 2001 traditional medicinal and health care systems of tribal of Satpuda Region, Maharashtra state plant achieves (1&2)111-118.
- Karnik C.R. 1966 some medicinal plants from Satpuda mountain India forester 92:173-183

- Salunkhe I.B. 1995 contribution to the flora and vegetation studies of southern Satpuda ranges w.e.to Yawal wild life sanctuary Ph. D. Thesis University of Pune.

Table.1 Showing Name the plant, Family ,vernacular name , Plant part used , Name of the disease and mode of administration.

Sr No	Name of Plant	Family	Common Name	Plant part used	Name of Diseases	Mode of Administration
1	Acalypha indica L.	Euphorbiaceae	Kokhali	Leaf	Cold & Cough	Oral, decoction
2	Bauhinia racemosa Lamk.	Caesalpiniaceae	Apta	Bark	Cold & Cough	Oral infusion
3	Euphorbia hirta L.	Euphorbiaceae	dudhi	Whole Plant	Cold & Cough	Oral, decoction
4	Ocimum basilicum L.	Labiatae	Sabja	Leaf	Cold & Cough	Oral, decoction
5	Ocimum gratissimum L.	Labiatae	Tulsi	Leaf	Cold & Cough	Oral, decoction
6	Psidum guvava L.	Myrtaceae	peru	Leaf	Cold & Cough	Oral, decoction
7	Acacia leucophloea (Roxb.) willd	Mimosaceae	hiwar	Bark	Body pain	External used as paste
8	Aloe vera L.	Liliaceae	Korphad	Leaf	Body pain	External used as paste
9	Calotropis procera (Ait) R. Br.	Asclepediaceae	Rohimsdar	Latex	Body pain &stomach ache	External used as paste
10	Eucalyptus camaldulensis Dehuh	Myrtaceae	Nilgiri	Leaf	Body pain	External used as paste
11	Hibiscus cannabinus L.	Malvaceae	Ambadi	Whole	Body pain	External used as paste
12	Argemone mexicana L.	Papaveraceae	Pila Dhotra	Root	Stomach ache	Oral decoction
13	Aegle marmelos L.Corr	Rutaceae	Bel	Fruit	Stomach ache	Oral decoction
14	Azardiracta indica A. Juss.	Meliaceae	Neem	Leaf	Stomach ache	Oral infusion
15	Ficus religiosa L.	Moraceae	Pipal	Bark	Stomach ache	Oral decoction
16	Lantana camara	Verbenaceae	Ghaneri	Leaf	Stomach	Oral decoction

	L.				ache	
17	Tectona grandis L. f.	Verbenaceae	Sag	Leaf	Stomach ache	Oral decoction
18	Ricinus communis L.	Euphorbiaceae	Erandi	Leaf	Jaundice	Oral decoction
19	Tinospora cordifolia (willd) miers .	Menispermaceae	Gulvel	Root	Jaundice	Oral decoction
20	Terminalia arjuna (Roxb. Ex. C.) W & A	Combretaceae	Arjun	Bark	Jaundice	Oral decoction
21	Terminalia bellirica (Gaeth) Roxb.	Combretaceae	Behda	Bark	Jaundice, Asthma	Oral decoction
22	Vigna radiata (L.) Wilczek	Fabaceae	Adad vel	Whole plant	Jaundice	Oral decoction
23	Asparagus racemosus willd .	Liliaceae	Shatavari	Whole plant	Eyes	Ext. Paste
24	Butea monosperma (Lamk) Taub.	Fabaceae	Palas	Leaf & Gum	Eyes & dysentry	Ext. Paste& eats orally
25	Brassica juncea L.	Brassicaseae	Mohri	Whole plant	Dysentery	Oral Decoction
26	Croton banplandianum Baill	Euphorbiaceae	Croton	Bark & root	Dysentery	Oral Decoction
27	Evolvulus alsinoidies L.	Convulvulaceae	Vishnu Kanti	Whole plant	Dysentery	Ext. paste
28	Madhuca longifolia (koen) Mac. Bride	Sapotaceae	Mahu	Bark	Dysentery, Rheumatism, Head ache	Oral infusion
29	Melia azadirachta L.	Meliaceae	Bakam	Bark	Boils	Oral decoction
30	Cassia auriculata L.	Caesalpiniaceae	Avali	Root	Diabetes	Oral decoction
31	Catharanthus Pusillus (Marr) G. Don	Apocynaceae	Sadafuli	Flower	Diabetes	Oral decoction
32	Syzygium Cumini (L.) Skeels	Myrtacea	Jamun	Fruit	Diabetes	Oral

33	Lagascea mollis Cav.	Compositae	Boal	Leaf	Diarrhoea	Oral decoction
34	Tectona grandis L. f.	Verbenaceae	Sag	Seed	Diarrhoea	Oral decoction
35	Vigna radiata L.	Fabaceae	Adad vel	Root	Diarrhoea	Oral decoction
36	Calotropis giangtea (L.) R. Br	Asclepediaceae	Rohimsdar	Latex	Wounds	Ext. Paste
37	Cordia dichotoma Forst. f.	Euphorbiaceae	Bhokar	Seed	Wounds	Oral decoction
38	Mirabilis jalapa L.	Nyctaginaceae	Gulbakhshi	Fruit	Wounds	Ext. Paste
39	Cyndon dactylon L.	Poaceae	Durva	Whole plant	Fever	Ext. Paste
40	Cassia fistula L.	Caesalpiniaceae	bahava	Fruit	Fever	Oral decoction
41	Cassia tora L.	Caesalpiniaceae	tarota	Young leaves	Rheumatism	Cooked
42	Cassia angustifolia VahL	Caesalpiniaceae	Senna	Leaves	Constipation, loss of appetite	Oral
43	Solanum virginianum L.	Solanceae	Piludi	Whole plant	Fever	Oral decoction
44	Solanum nigrum L.	Solanceae	Kangani	Fruits	Fever, diarrhea	Oral
45	Solanum xanthocarpum schard .& Wendl.	Solanaceae	Bhuiringaini	Roots	Asthma, Cough Kidney stone	Oral

19. Microwave Assisted Chemical Synthesis for Sustainable Development

Balaji D. Rupnar
Department of Chemistry, R. B. Attal College, Georai, Dist. Beed.

Abstract

The term green chemistry is defined as "the invention, design and application of chemical products and processes to reduce or to eliminate the use and generation of hazardous substances.'' It also involve substitute to conventional methods of heating with that of non-conventional methods of heating such as microwave radiations which help to decrease carbon footprint as low as possible. Microwave-assisted organic synthesis is an enabling technology for accelerating drug discovery and development processes. Microwave organic synthesis opens up new opportunities to the synthetic chemist in the form of new reaction that are not possible by conventional heating and serve a flexible platform for chemical reaction.

Keywords: Green chemistry, conventional, non-conventional, sustainable development

Introduction

In recent years, the increasing awareness to environmental issues has focused the need for environmental benign and sustainable technologies in pharmaceutical industry. One of the major challenges of synthetic chemists is to speed up the production of small molecules to get growing needs of biologists for screen large number of compounds to recognize the lead molecules. Conventional heating required a long time (hours/days) to complete the reactions. Therefore, chemists were alternatively looking for the new technology to speed up the reaction time. Microwave heating compared with conventional heating is much more efficient and allows faster heating to complete the reactions very fast (minutes/seconds). Microwave-assisted synthesis is based on the efficient heating of materials by microwave dielectric heating. In microwave, the temperature of mixture can be raised more than its boiling point i.e. superheating take place. The first reports from Gedye and Giguere discovered the utilization and advantages of microwave irradiation for organic synthesis [1, 2]. Since then organic synthesis by microwave energy has gained extensive spread importance by synthetic chemists because of the speed and ease of the synthesis of small molecules [3, 4]. In recent years, microwave irradiation has brought organic

transformations to new dimensions. Microwave energy is usually safe and efficient to carry out reactions and its acceptance is growing in academic laboratories including industrial research. Using microwave energy chemists can successfully achieve most difficult reactions which are not possible by conventional heating This technology is still under-used in the laboratory and has the potential to have a large impact on the fields of screening, combinatorial chemistry, medicinal chemistry and drug development.

Microwave Impact on Chemicals

Microwave ranges from 0.01m to 1m wave length and 30GHz to 0.3GHz frequency and lie in the region of the electromagnetic spectrum between I.R and radio wave. The basic principle behind the heating in microwave oven is due to the interaction of charged particle of the reaction material with electro-magnetic wavelength of particular frequency. This cause rapid orientation and reorientation of molecule, which cause heating by collision. The phenomena of producing heat by electromagnetic irradiation are ether by collision or by conduction, sometime by both. The heating arises from the interaction of electric field component of the wave with charge particle in the material through dipolar polarization. On exposure to an oscillating electromagnetic field of appropriate frequency, polar molecules try to follow the field and align themselves in phase with the field. The key requirement for dipolar polarization is that the frequency range of the oscillating field should be appropriate to enable adequate inter -particle interaction. If the frequency range is very high, inter-molecular forces will stop the motion of a polar molecule before it tries to follow the field, resulting in inadequate inter-particle interaction. Microwave radiation has the appropriate frequency (0.3-30 GHz) to oscillate polar particles and enable enough inter-particle interaction. This makes it an ideal choice for heating polar solutions.

In addition, the energy in a microwave photon (0.037 kcal/mol) is very low, relative to the typical energy required to break a molecular bond (80-120 kcal/mol). Therefore, microwave excitation of molecules does not affect the structure of an organic molecule, and the interaction is purely kinetic.[5]

Microwave and Solvent

Every solvent and reagent will absorb microwave energy differently. They each have a different degree of polarity within the molecule, and therefore, will be affected either more or less by the changing microwave field. A solvent that is more polar, for example, will have a stronger dipole to cause more rotational movement in an effort to align with the changing field.

A compound that is less polar, however, will not be as disturbed by the changes of the field and, therefore, will not absorb as much microwave energy. Unfortunately, the polarity of the solvent is not the only factor in determining the true absorbance of microwave energy, but it does provide a good frame of reference. The low absorbers are generally hydrocarbons while the high absorbers are more polar compounds, such as most alcohols.[6]

Conclusions

In all field of chemical synthesis have been attracted towards microwave assisted reactions in recent years. In the future, with lower costs, microwave synthesis will become an integral part and a standard technology in a large amount in most synthetic laboratories and will continually make valuable impact on organic synthesis, fabrication of materials, synthesis of biomaterials.

References

1. R. Gedye, F. Smith, K. Westaway, Tetrahedron Lett. 1986, 27,279–282.
2. R. J. Giguere, T. L. Bray, S. M. Duncan, G. Majetich, Tetrahedron Lett. 1986, 27, 4945–4948.
3. E. L. Hayes, Microwave Synthesis: Chemistry at the Speed of the Light, CEM Publishing, Matthews, NC, USA.
4. A. Loupy(Ed.),Microwaves in Organic Synthesis (2nd Edition). Wiley-VCH, Darmstadt, Germany.
5. D. Adam, Nature, 2003, 421, 571-572.
6. H. E. Blackwell, Org. Biomol. Chem. 2003, 1, 1251-1255.

20. Mythology and Environment: A Perspective Study in Novels of Amish Tripathi

Pramod W. Saindane
Student, P.E.S.S. A. C. S. College, Walwadi-Bhokar, Dhule.
Dr. Prof. Sunil G. Baviskar
Guide, Smt. N.N.C. A. C. S. College, Kusumba, Tal. Dist. Dhule.

Abstract

This paper carries out a critical review of the trends of mythology and environment. In ancient mythology, it tells about nature and beauty. It describes about the holy rivers like Saraswati, Ganga, and Yamuna that flow in India. Mythology and Environment have very close relationship between them. Mythology describes importance of rivers and its waters.

The author tells about environmental changes and effect on the people special reference of Saraswati River, Somras is made by its water. Amish Tripathi describes its water is as 'Amrut', which flows from different mountains, hills and places. Many cities and villages situated on the bank of rivers and the people call it as Goddess. When one starts to read the novel, Saraswati seems to be on death bed. In spite of it, the two countries Mehula and Swadweep means Suryavanshi and Chandravanshi battle for it. The battle between them is crucial. Thus, it is the need to save water, environment and our earth.

Introduction

Natural environment has always been depicted since ancient times in various forms of literature, even in religious scriptures are full of such references about natural surroundings. The 'pastoral' form of literature which was initiated in the 3rd century BC by Theocritus of Greece reflected the scene rural life full of simplicity and harmony, this form become very popular as it uplifted the rustic life against the degraded complex life of urban society. Ecocriticism established itself as an independent organization under the name "Association for the study of literature and environment" (ASCE) with its own academic journal. "Inter disciplinary studies in literature and environment" (ISLE) their aim is to create awareness through ecocritical writings, amongst the world community about the concern for environment.

The aim of this paper is to study The Shiva Trilogy by Amish Tripathi, which contains three novels are The Immortals of Melula, The Secret of the Nagas and The Oath of Vayuputras. These novel deals with Somras and some historical facts of nature.

SOMRAS: Some Historical Facts of Nature

The author is inspired by some thoughts, incidents and stories of past. Banaras (Varanasi), a city situated on the bank of Varuna and Asi. The city has its historical and mythical importance. In the novel,

Bhagirath, with the help of Meluhan engineers, had come up with a brilliant plan. The sides of the Yamuna were dug up and giant sluice gates were built along them. These gates, serving as locks, would be opened slowly to guide the Yamuna onto its new course in a deliberate and controlled manner, over many months. Bhagirath had named these sluice gates the 'Locks of Shiva'. The Yamuna was thus slowly diverted onto its new course, to unite with the Ganga at Prayag. The Lock of Shiva had thereby allowed the Ganga to take its new form, gradually, without the chaos of an uncontrolled flood.

The addition of the massive Yamuna, along with the already worthy presence of the enormous Brahmaputra, had enhanced the mighty Ganga into the biggest river system in India. It also came to be believed that the Yamuna carried the soul of the Saraswati into the Ganga, thus transforming it into the holist river in India.[Tripathi 2013: 557]

Banaras situated on the bank of Ganga is a sacred river but now due to some reasons it has become polluted. The reasons are- 1) Many industrial cities like Kanpur drain industrial waste into it. 2) Wastage and sewage water mix in it.

It becomes very necessary to discuss about Ganga otherwise it will also extinct like Saraswati. So we can say that the novelist is trying to warn us to save Ganga. The author is inspired by Micheal Danino's book 'The Lost River- On the trail of The Saraswati'. He has written a lot on the river Saraswati. Saraswati was the most sacred river of ancient Indian civilization. It was mentioned in almost all ancient texts like the Rig-Veda, Ramayana, and Mahabharat etc. The Saraswati has always been believed to flow over the great gangetic plains and meeting the Ganga and Yamuna at the Sangam (Prayaga). In the novel the flow of River Saraswati covers areas of Gujarat, Rajasthan, Haryana, Panjab, whole of Kashmir and parts of present Pakistan. The whole area was the past of Meluhan Empire. It rises from mount Kailash in mansarovar and flows through the following route-Mount Kailash – Devagiri – Mrittikavati. In

the river flow so many types of important nutrition and plant substance. The novelist writes also about healing power of water—1) It slows down the ageing process. 2) It cures much type of diseases. 3) It releases oxidants from the body. The Somras when consumed, reacts with the oxidants, absorbs them and expels them from the body through sweat and urine. 4) Somras operates on body at primary levels. Our body is made of millions of cells, which are building blocks of our body. They divide and grow and when stops dividing, makes our body aged and eventually dead. By consuming Somras these cells remains healthy and always divide and replaces the old cells. During the discussion between Shiva and Brahaspati on Somras, the author notes:

> 'This division and growth has to end sometime. Otherwise one's body would keep growing continuously with pretty disastrous consequences. So the Almghty put a limit on the number of times a cell can divide. After that the cell simply stops dividing further and thus, in effect; becomes old and unhealthy'
> 'And do these old cells make one's body age and thus eventually die? asked Shiva.
> 'Yes, every cell reaches its limit on the number of divisions at some point or the other. As more and more cells in the body hit that limit, one grows old, and finally dies.'
> Does the Somras remove this limit in division?
> 'Yes. Therefore, your cells keep dividing while remaining healthy. In most people, this continued division is regulated. But in a few, some cells lose control over their division process and keep growing at an exponential pace'.
> 'This is cancer, isn't it? asked Sati [Tripathi 2013: 15]

Brahaspati is explaining shiva how these oxidants are removed from the body. Shiva then asks 'ls this reason that consuming Somras for the first time causes poisoning?' Brahaspati replies people of Meluha take Somras so that they can live for more than hundred years. Amish use Somras here as a medicine not as a wine. In ancient India, Somras was a wine. The process of preparation of Somras is very complex. While making Somras, Sanjeevani trees and Saraswati water mixed and heat is generated to make the mixture stable. The branches of Sanjeevani are

crushed and churned in huge machines with water. The water from the Saraswati is brought to these machines through complex system of canals. The water is collected in enormous pools in cavern which is called Sagar, an ocean .This ocean is very vast and needs much water. The researcher wants to discuss is that Somras on one hand is blessing for many people but at the same time it becomes curse who consume too much. "That the Somras has been the greatest Good of our age is pretty obvious,' said Brahaspati. 'It has shaped our age. Hence, it is equally obvious that someday, it will become the greatest Evil. The key question is when would the transformation occur".[Tripathi 2013: 11]

The novelist Tripathi also talks about death of Saraswati on the sacredness of this river and also that this holy river was respected in ancient India and that is only we are responsible for the extinction of this river. Even today, we are not taking this problem seriously and if we continue to remain careless we will see the same fate of other rivers also. Therefore Shiva could clearly see the side effects and the ecological destruction caused by the Somras. So bad effects of Somras are – 1) It causes cancer.2) It causes ecological imbalance. 3) It generates large amounts of toxic waste, which cannot be disposed on land or in sea. 4) It causes plague of Branga. 5) It causes deformities among Nagas. The author has also suggested easy process to explore the toxin.

By consuming Somras Mehulan people live long life. Daksha lived for 184 years old. In fact in Mehulan people do not look old. In the novel, Nandi also lives more than hundred years old. Shiva asks the cause of it. Brahaspati tells how Somras works in the body. When it enters into the body the diseases in the body starts vanishing and cured. When the diseases are completely cured they never occur again and the body remains healthy.

Conclusion

While reading Amish Tripathi trilogy The Shiva Trilogy one realizes the importance of rivers and nature as well. The death of Saraswati, the increasing pollution of Ganga is the example of bad effects on environment. We have already highly polluted the rivers and imbalanced the nature. If we continue with this the day is not long when we will have no good and hygienic place to live.

Bibliography

- Tripathi, Amish. The oath of the Vayuputras. New Delhi: Westland ltd., 2013.
- Tripathi, Amish. The Immortals of Meluha. New Delhi: Westland ltd., 2010.

- Tripathi, Amish. The Secret of the Nagas. New Delhi: Westland ltd., 2011.
- Tripathi, Amish. Scion of Ikshvaku. New Delhi: Westland ltd., 2015.
- Saintsbury, George. The English Novel. New Delhi, Royal Publication, 1999.
- Dodd, E.F., Stories from Famous Poems, Mumbai : Macmillan and company ltd., 1970.
- Verma, K. D., The Indian Imagination : Critical Essays on Indian Writing in English, Macmillan India ltd, 2000
- Legouis and Cazamian. History of English Literature. New Delhi Macmillan India ltd., 1995.
- White, Lynn Jr., The historical Roots of Our Ecological Crisis., Science 1967.
- Love, Glen A., Reevaluating Nature: Toward an Ecological Criticism, Western American Literature, 1990.
- Garrard, Greg. Ecocritism, London, Routledge. 2004.
- An abstract from a minor research project on LITERATURE AND ENVIRONMENT: PERSPECTIVES ON STUDIES IN ECOCRITICISM IN INDIA completed and submitted to the U.G.C. by Dr. M. L. Jadhav, Associate Professor, Dept of English, Shivaji University, Kolhapur.

21. Dielectric Properties of Wheat Food Grain and It's their Frequency Dependence

M. N. Chaudhari
Smt. NNC, Arts, Commerce and Science College, Kusumba, Dhule, Maharashtra (India).
R. B. Ahirrao
NNS, Uttamrao Patil Arts and Science College, Dahiwel, Dhule, Maharashtra (India).

Abstract

Values of dielectric constant (ε'), dielectric loss (ε''), relaxation time (τ), conductivity (σ) of Wheat were measured at room temperature at four different frequencies 11.4 GHz in microwave region. All these dielectric parameters of Wheat grains are found to increase with increase in percentage moisture content. Variations are non- linear and the rate of increase is faster at higher MC (%) values. Results reported here are useful in designing the moisture meters, possible selective dielectric heating and also for control of insects that infest stored grain. The present values of dielectric constant are in good agreement with the values reported by other authors.

Keywords: Dielectric constant, dielectric loss, a. c. conductivity, relaxation time, frequency.

1. Introduction

Dielectric properties of materials are those electrical characteristics of poorly conducting materials that determine their interaction with electric fields. The two properties of major interest are the dielectric constant and the dielectric loss factor of materials. These properties are important in any processes involving radio-frequency or microwave dielectric heating. They determine how well energy can be absorbed from the high frequency alternating electric fields and thus how rapidly the materials will be heated. Since dielectric properties of materials are highly correlated with the amount of water in materials, sensing the dielectric properties can be used for rapid measurement of moisture content in materials such as agricultural products and food materials.

Wheat is the most widely grown type of millet. It survives in soils with high salinity, low soil fertility and drought. India continues to be the single largest producer of Perl millet in the

world. It is high in protein as compared to other cereals .Wheat helps maintain cardiovascular health and helps reduce acidity problems. Many factors, including frequency, temperature and moisture content, influence the dielectric properties of agroproducts and food Materials. (Venkatesh & Raghvan, 2004). Knowledge of the relationship between frequency and dielectric properties is helpful in determining the optimum frequency range in which the material in question has the desired dielectric characteristics for intended applications (Nelson, 2005). The moisture-dependent dielectric properties in specific frequency ranges can be used to develop online moisture meters (Nelson et al, 1992), which may be applied not only in drying processes but also in other unit operations in the food industry. Several investigations on dielectric properties of agricultural products have been reported. Dielectric properties of chickpea flour in compressed form were determined by Guo et al (2008) and it was observed that dielectric constant and loss factor of the sample decreased with increase in frequency frequency at all temperatures and moisture levels . Recently, dielectric constant and loss factor of Raj- 4120 variety of Indian wheat have been determined by Sharma et al., (2010), in powder form of grain size 125 to 150 microns at room temperature by employing the technique proposed by Yadav and Gandhi (1991) at three different frequencies lying in C-band, X-band and Ku-band .

The purpose of this research was to study effect of frequency variation and moisture content variation on dielectric properties of Wheat in powder form at room temperature.

II. Materials and Methods

A. Materials

Hindi Name	Gehun
English name	Wheat
Botanical name	Triticum aestivum
Family name	Poaceae

In the realm of food crops in the world, wheat occupies the number one position. Wheat is the major food component of most of the people worldwide, as it is rich in carbohydrates and in dietary proteins, being only next to the pulses in protein contents. India is one of the principal wheat producing and consuming countries in the world. Its importance in Indian agriculture is second to only rice. Wheat flour based products, such as the bread (chapatti) is part of the staple diet in most of the parts of India - particularly in northern India. Wheat products are used to prepare different food items, like breads, biscuits, cookies, cakes, breakfast-cereal, pasta, noodles, couscous etc. Wheat by way of its fermentation is also used for items like beer, alcohol, vodka, bio-fuel etc. Wheat, in its natural unrefined state, features a host of important nutrients. Indian Wheat (whole grain) contains in every 100 grams of it, 71.2 grams of carbohydrates, 11.8 grams of proteins, 1.5 grams of total fat, 12.8 grams of moisture, 1.2 grams of crude fiber and 1.5 grams of minerals (Gopalan et al., 2007).

B. Methods

i) Preparation of Sample and Experimental Set-Up

Wheat grains used in these experiments are purchased from local market. Initially, distilled water is sprayed on these grains and they were kept for few hours in order to acquire uniform moisture content. Then gravimetric moisture content of cereal grains will be gradually reduced by drying it in a hot air oven at 40^0C to 45^0C. For transmission of electromagnetic energy at microwave frequency range, waveguides are preferred to transmission line. The electric and magnetic fields are confined within the space of guide in rectangular waveguide. A waveguide cell method has been used in these measurements. It is used at normal incidence in TE_{10} Mode. An automated X band set up (Fig. 2) used in TE_{10} mode Gunn power supply, PC based slotted line control and data acquisition system is so used. The solid dielectric cell with and without sample is connected to the opposite end of the source. The signal is generated from microwave source. That signal allowed to incident on the cereal grain sample. The sample from its front surface reflects part of incident signal. The reflected wave combined with incident wave produces a standing wave pattern. The values of shift in minima resulted due to before and after inserting, the sample is determined using these standing wave patterns.

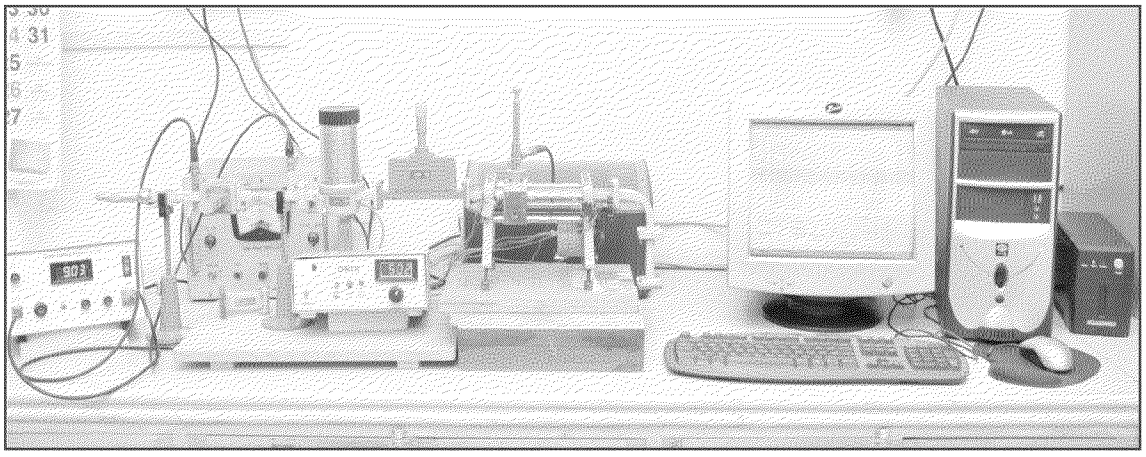


Fig.2.Photograph of X-band microwave set-up (along with PC-Based Software) for measuring dielectric constant of Wheat grains.

ii) Measurement of Dielectric Constant and Dielectric Loss in Wheat

The dielectric parameters of Bajara grains are estimated by using following formulae:

a) Dielectric constant (ε')

$$\varepsilon' = \frac{g_\varepsilon + (\lambda_{gs} / 2a)^2}{1+(\lambda_{gs}/2a)^2} \quad \text{---------- (1)}$$

b) Loss factor(ε")

$$\varepsilon'' = - \frac{\beta_\varepsilon}{1+(\lambda_{gs}/2a)^2} \quad \text{---------- (2)}$$

c) Microwave conductivity (σ)

$$\sigma = \omega\varepsilon_o\varepsilon'' \quad \text{---------- (3)}$$

d) Relaxation time

$$\tau = \varepsilon''/\omega\varepsilon' \quad \text{---------- (4)}$$

Where, **a** = inner width of rectangular waveguide

λ_{gs} = wavelength in the air-filled waveguide

$\mathbf{g_\varepsilon}$ = real part of the admittance

β_ε= imaginary part of the admittance

$\omega = 2\pi f$

f = microwave frequency

ε_o = permittivity of free space.

III) Results and Discussion

Experimental results on the variation dielectric parameters such as dielectric constant (ε'), dielectric loss (ε''), a. c. conductivity (ϭ) and relaxation time (τ) with % moisture content values (0-30%) for the Bajara (Pennisetum Glaucum) grains at X-band microwave frequency 11.4 GHz are represented graphically in Figs. 3 and 4.

From Fig.3 (a), it is seen that the dielectric constant (ε') increases gradually with increase in % moisture content. However, this variation is non- linear indicating that the rate of increase is faster at higher MC (%) values. In Fig.3 (b), the dielectric loss (ε'') increases gradually with increase in % moisture content. However, this variation is relatively more non- linear and also indicating that the rate of increase is faster at higher MC (%) values. Our results are in fairly good agreement with the results of earlier investigators [1,2,3,4,8].

The values of the dielectric constant and loss factor for Wheat are reported in Table 1 for grain size 250-300 micrometers at four different frequencies in X band in the microwave region. From the table we observe that both the values of dielectric constant and loss factor decrease with increase in frequency.

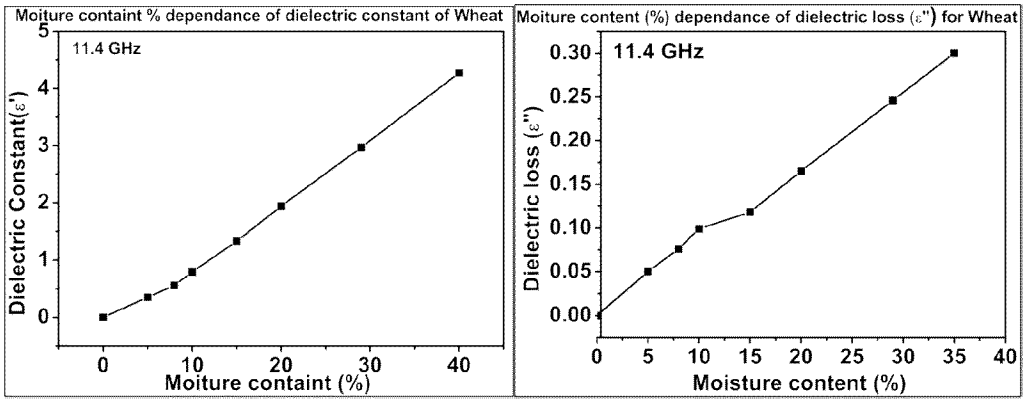


Fig. 3. (a) Variation of the dielectric constant with moisture content of Wheat (b) Dielectric loss factor with moisture content of Wheat for frequency of 11.4 GHz.

From Fig.4 (a), it is seen that the a. c. conductivity (ϭ) increases gradually with increase in % moisture content. However, this variation is non- linear and indicates the dependence of ϭ on the ε''. increase is faster at higher MC (%) values. This result is expected, because the motion of charges in the dielectric (Bajara) gives rise to the conduction current and hence polarizes the dielectric. This dielectric polarization is thus found to increase with the MC level of soils.

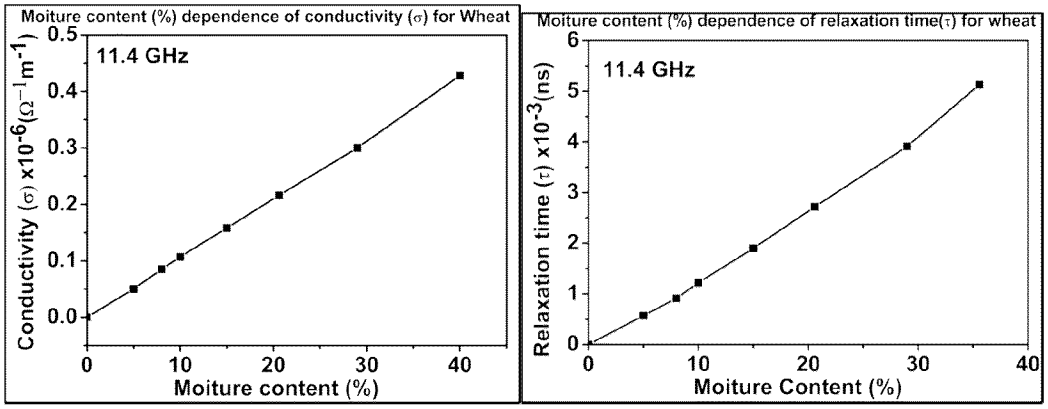


Fig. 4. (a) Variation of the a. c. conductivity with moisture content of Wheat and (b) Relaxation time with moisture content of Wheat for frequency of 11.4GHz

In Fig.4 (b), the relaxation time (τ) is also found to increase gradually with increase in % moisture content. Further, this variation is relatively more non- linear and also indicating that the rate of increase is faster at higher MC (%) values. This suggests that the mobility of the molecules (dipoles) of soils is found to increase with the MC level of soils. This result is expected, as τ is proportional to the dissipation factor (ε''/ ε'). Our results are in close agreement with the results of earlier investigators [7,8,9].

IV. Conclusions

1. Dielectric constant (ε') and the dielectric loss (ε'') of wheat grains gradually increases with increase in its percentage moisture content. This variation is non- linear and the rate of increase is faster at higher MC (%) values.
2. The a. c. conductivity (ϭ) and relaxation time (τ) of Wheat grains increases with increase in its percentage moisture content. This variation is also non- linear and the rate of increase is faster at higher MC (%) values.

V. Applications

1. An important application of determination of dielectric properties of dry and moist cereal grains is in the design and development of electronic moisture meters.
2. The dielectric properties of the materials have been studied for such use in grain drying, milling and also in selective dielectric heating for control of insects that infest stored grain.
3. The studies of microwave absorption by different types of food grains may also useful in efficient design of microwave oven and microwave cooker.

4. One of these was the possible selective dielectric heating for control of insects that infest stored grain.

Acknowledgement

The authors are very much grateful to the Principal, Z. B. Patil College, Dhule, for providing research facilities.

References

1. Nelson S. O., Trans. of the ASAE, 1999, 42(2), 523-529.
2. Vaenkatesh M.S. and Raghavan G.V.S., Canadian Biosystem Engineering, 2005, 47, 7.15-7.30.
3. Nelson S. O., Trans. of the ASAE, 1972, 15(6), 1094-1098.
4. Nelson S. O., W. R. Forbus Jr., and K. C. Lawrence, Trans. of the ASAE, 1995, 38(2), 579-585.
5. Nelson S. O., RES. AGR.ENG., 2008, 54(2), 104-112.
6. Nelson S. O. and Trabelsi S., J. of Microwave Power and Electromagnetic Energy, 2012, 46(2), 93-107.
7. Bottcher C. J. and Bordewijk P.," Theory of electric polarization, 1978, 2, Amsterdam, Oxford, New York, Elsevier Scientific publishing company.
8. Cole K. S. and Cole R. H., J. of chemical physics, 1941, 9, 341-351.
9. Davison and Cole., J. of chemical physics, 1951, 19(12),1481-1490.
10. Havrilicks and Negami S., Polymer, 1967, 8, 161-210.
11. Ahire D. V. and Chaudhari P. R., Journal of Chemical, Biological and Physical Sciences,2014, 5(1), 802-808.
12. Ahire D. V. and Chaudhari P. R., Proceedings of the 9 th International Conference on Microwaves, Antenna, Propagation and Remote Sensing (ICMARS), 2013, 293-296.

22. Occurrence of Pesticide Deltametrin in the Soil Samples of Sakri Taluka of Dhule District of Maharashtra, India

S. S. Shewale
Uttamrao Patil Arts and Science College Dahiwel.
L. B. Pawar
S.G.Patil Arts, Comm, and Science College Sakri. Dis- Dhule.

Abstract

Survey of marketing shops was carried out which sold 27512 kg. of organochorine 12610 kg. of organophosphorus, 5848 kg. of carbonet and 15994 kg of synthetic pyrethroids.These pesticides are used by farmers in very small areas of land for cultivation of Grapes, Pomegranates, and vegetables.

Objective

Objective of our study was to find out pesticidal contamination of soil. One sample of soil per month durig 2008 was collected from field and analyzed to investigate residues in soil samples. Our studies show that Deltametrine organochlorine pesticide were detected above limit of quantification in 04 samples .For analysis of soil samples GCMS and LCMS system were used.

Introduction

India is the third largest consumer of pesticides in the world and highest among south Asian countries (Kumari B, 2002) more than 128 pesticides are registered in India (Laxmi, 1992).

Due to subtropical climatic condition proliferation of insecticide is very high, pesticides have therefore become an inevitable tool in controlling the pest of various field crops, about 10-12% of the total pesticides used on fruits and vegetable crops. Pesticides are spread through all segments of the environment (Jensen, et al., 1969) due to indiscriminate usage. Their persistent use leads to build up of toxic residues on crop produce, which may exert adverse effect on human health in addition to disturbing the ecosystem. This problem is more serious in case of vegetable, as these are often consumed either raw or without much processing or storage. Having

global existence, organochlorine insecticide residue have been reported from each and every environmental commodity such as water vegetable, milk etc (Kumari et al., 2002)

In 1996 on Indo Dutch study of River Yamuna water had found pesticide like DDT, aldrine, dieldrine heptachlore and BHC in the river water being supplied to the city as drinking water (CGWB, 2000). The level of pesticides present in the water in an area depend on the amount of pesticides used per unit area for instance the level of pesticide in the water is low in Himachal Pradesh as the pesticide consumption of pesticides is low in the state compared to the consumption in Delhi, Uttar Pradesh & Haryana (Kumari et al, 1996).

Residues of extremely harmful pesticides have been found in popular brand of bolted water sold in Delhi and Mumbai (CSE, 2002). Since the practice of agriculture began, human have been struggling to reduce the adverse effects of pests on crops, forest and ecosystem. Pests such as arthropods, weeds and pathogens have been still continued to be a major constraint to agricultural production throughout the world. Man has been combating against his pest enemies from the day he learnt the art of agriculture.

Selection of Sample Area & Crop Pattern & Use of Pesticides

One year data and sample collection work was conducted during 2008-09. In my study work Panzara basin area (Kudashi Circle) were selected in Sakri Tahasil of Dhule Dist. Maharashtra. This area is located in range of Western Ghats on border of Gujarat. Geographically area is located at latitude $20^0$55' N and longitude $74^0$5'E is 532 Meter above the mean sea level.

Irrigation facilities are in western tribal area only depends upon monsoon rain water. Most of population is tribal community people whose main occupation is traditional farming & cultivating paddy & barely only. But study area is only located just 25 km east of this area. In study area tribal populations is less and are cultivating cash crops like Cotton, Vegetable & fruits like Grapes, Pomegranate which requires extensive use of Pesticides. The crops cultivating in Sakri Tahasil during 2008-09 according to Taluka Krushi Adhikari, paddy were cultivated 5850 hectare, Maize 16400 hectare Bajara 40880 hectare, Jowar 1260 hectare Barely 4400 hectare. Mug were cultivated 1550 hectare Udid 2950 hectare, Tuwar 750 hectare, Groundnut 12500 hectare Sunflower 5 hectare, Soybean 11500 hectare, Cotton 7241 hectare, Sugarcane 4056 hectare. Vegetable and Fruits were cultivated in Tahsil area were Pomegranate

712 hectare , Sitaphal 115 hectare Amala 56 Hector, Mango 70 hectare Grapes 27 hectare , Tomato 112 hectare Green Chili 215 hectare r, Onion 1250 hectare .

Most of the area come under irrigation of Latipada Dam water and open well irrigation. The average rainfall during June 08 was 142 mm, July 269, mm. August 145, mm. and in September was 199, mm, total rainfall in monsoon 2008 was 744 mm, (according to Taluka Krushi Adhikari, Sakri Dist. Dhule).

According to my survey of Pesticide Shops yearly sold Pesticides were 27512 kgs of organochlorine, 12610 kgs of organophoprus, 5848 kgs carbamates and 15994 kgs of Synthetics Pyrethroids.

Fungicides are extensively used for controlling the fungal infections because of climatic condition. Consumption of different Pesticides reaches the water either by direct application or indirectly and unintentionally. The indirect sources include run-off from agricultural fields, spray drifts, rainwater, sewage and effluents from industries manufacturing pesticides or using them in the processes. (Kumar et;al 1995).

Pesticides reach the water either by direct application or indirectly and unintentionally. The indirect sources include run-off from agricultural fields, spray drifts, rainwater, sewage and effluents from industries manufacturing pesticides or using them in the processes. (Kumar et;al 1995).

Pesticides reach the water either by direct application or indirectly and unintentionally. The indirect sources include run-off from agricultural fields, spray drifts, rainwater, sewage and effluents from industries manufacturing pesticides or using them in the processes. (Kumar et;al 1995).

Material & Method

Soil sample were taken every month before 15th.Samples were taken at seven points located at intervals a 50 m on transect with a5% downword slope between the site of pomegranate, grapes and vegetable fields.The whole transect contained within the 225000m^2 area.(Crespo et.al 2001) At each sampling point one sample were taken with an Eijkelkamp mod.04.20.SA sampler from soil layer:0 to 20 cm only.Samples were introduce in plastic bags and were transported to the Reliable analytical laboratory , Thane. Maharashtra.

In the laboratory, soil sample were air –dried and passed through a2 mm mesh sieve, and were pooled and homogenized in a homogenizer. All analysis were performed on three samples of pooled samples for each site.

Particle size distribution was determined following oxidation of organic matter with hydrogen peroxide. The fraction of >50 micro meter was removed by sieving and sub-50 micro meter fraction was fractioned using the international method (Day,1965) organic carbon content was determined as per (Walkley & Black (1934) cation exchange capacity(CEC) and exchangeable content were determined as per (Henders hot &Duquette(1986).

For organochorine &synthetic pyrethroid by gas chromatography (GC-MS) method and for organophosphorous liquid chromatography and gas liquid chromatography(LC/MS/MS &GCMS).(DFG pesticide commission,1987)

The typical limit of quantification under these conditions was 0.1mg/kg.

Results

Organochlorine Deltametrin in were Detected in 04 Samples in 36 Soil Samples

Pesticides		June-08			July-08			Aug-08			Sept-08			Oct-08			Nov-08			Dec-08		
1	Deltha methrin	blq	blq	blq	blq	.01	.01	blq	blq	blq	blq	blq	blq	blq	.12	blq	blq	blq	blq	blq	blq	blq	blq

Pesticides		Jan-09			Feb-09			Mar-09			Apr-09			May-09		
1	Delthamethrin	.13	blq	.13	.01	blq	.01	blq	.01	.12	blq	blq	.01	.01	blq	blq

Quantification Level: 0.1mg/Lit.

Discussion

Organochlorine pesticide not only accumulate in animal tissue many are extrimly stable and persist in soil and plant and it soluble enough can also reach groundwater or surface water (Ritter,1990) They can therefore enter the food chain not only vai their target 0rganism but also imbibed water and via plant eaten by herbivores, including cattle (WHO).There persistence in soil depends both on the nature of soil and their own physiochemical properties whereas light soil facilitate the water born transport of soluble pesticide (walker et al; 1999) soil with high

clay organic matter content tends to retain both the more soluble pesticides and the more hydrophobic pesticide.

Conclusion

Health Effects of Pesticide in Drinking Water

Although most of us unknowingly encounter many toxic substances in our daily lives, in low enough concentrations they do not impair our health. Caffeine, for example, is regularly consumed in coffee, tea, chocolate, and soft drinks. The small amount of caffeine in these product impacts our nervous system acting as a stimulant. Excess amounts, however, can cause anxiety, high blood pressure and severe central nervous system stimulation. Although the amount of caffeine consumed in a normal diet does not cause illness, just 50 times this amount can kill a human. Similarly, oxalic acid found in rhubarb and spinach is harmless in low concentrations found in these foods, but oxalic acid will lead to kidney damage or death at higher doses. Gasoline, Carbon monoxide chlorine, household, bleach and cleaners, and alcohol are just a few of the numerous other substances we interact with each day and which can be toxic in high concentrations or due to excessive exposure.(Miller 2004).

In the agriculture industry, pesticides are one of the most commonly dealt with substances with potential for adverse effects on humans. Health effects of pesticides depend upon their chemical characteristics of many.

References

- **Central for science and Environment (2002) (CSE)** has posted its findings on the internet at cse India.org.
- **Handerson, C& Picketing, GH (1958).** Toxicity of organic phosphorus insecticide to fish .Trans. AM. Fish Soc. 39-51
- **Jensen, S, Johnels, A.G. Olsson, M,& offerlind, G (1969):-** DOT and PCB in
- **Kumar, K. and Dalela, R.C. (1995).** Acute toxicity of twenty three pesticides to a fresh water teleost saccobranches fossil. Proc. Symp. Environ. Biol., 481-
- **Kumari, Beena, Kumar, R. Madan, V.K. Singh ,Rajvir Singh, ,Jagdeep Kathpal, T.S. (2002).** Magnitude of pesticidal contamination in winter vegetables from HISAR, HARYANA.Environmental Monitoring & Assesment 87:311-318.

- **Kabir,A. Ramana Rao, K.V. and Swami,K.S. (1978). Effect of Malathion on enzyme activity in foot, mantle and hepatopancrease of snail, P. globosa: Indian J. Exp. Biol. 16.258-260.**
- **Kulkarni , S.G. Vaidya V.V. and Kulkarni G.K. (1996). Impacts of Heptachlor and Monoerotophos on the caudal regeneration of the Earthworm. Lompito mauritil. J. comp. Toxicol. Physiol. Vol.2 (I & II) 96-104 (2005).**
- **Laxmi, A. (1992):** Pesticides In India Risk Assessment and Policy. Second Europian Conference on Ecotoxicology 1-15 May 1992 Amesterdam.
- **Metcalf, R.L. (1951):** The colorimetric micro estimation of human blood cholinesterase and its application to poisoning by organophosphate insecticides. J. econ Entamol, 44,883-890.
- **Miller ,G.T.(2004)** Sustaining the Earth , 6th edition Thompson Learning, Inc. Pacific Grove California. Chapter 9 ,P. 211-216.

23. Pharmacognostic Studies in Leaf Drug Abrus Precatorius L.

Vikas S. Gambhire
Dept. of Botany, the Institute of Science, Mumbai (M.S.).
Rupali M. Biradar
Dept. of Botany, Indraraj Arts, Commerce and Science College, Sillod.
Dileep Pokle
Dept. of Botany, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

Abstract

Abrus precatorius L. is a much-branched, glabrous, perennial, woody, twiner belonging to family Fabaceae. Its leaves are medicinally exploited to treat several diseases and disorders. Being an important ayurvedic drug it is deliberately adulterated. Adulteration directly effects on quality of drug. Pharmacognostic studies in this leafy drug are carried out to standardize and detect the adulteration in it. Pharmacognostic studies include details of trichomes, stomata, epidermal characteristics and anatomical features of leaves. Physical characters of leaf powder like colour, odour, taste and phytochemical characters like Dry matter (DM), Bulk density, Nitrogen (N), Water soluble nitrogen (WSN), Crude protein (CP), Crude fat (CFat), Crude fibres (CF), Total Ash (TA), Acid insoluble ash (AIA), Acid soluble ash (ASA), Water insoluble ash (WIA), Water soluble ash (WSA), Calcium (Ca), Reducing sugars, Non-reducing sugars, Total sugars, Cellulose, Gross energy (GE), Phosphorus (P) and Extractive values in Water, Acetone, Butanol, Chloroform, Diethyl Ether, Ethyl alcohol, Methanol, Petroleum ether, Propanol, Toluene were also undertaken. The above parameters can be applied in combination to standardize this leaf drug.

Keywords: Standardization, Leaf drug, Phytochemical parameters, Adulteration

Introduction

Abrus precatorius L. is a much-branched, glabrous, perennial, woody, twiner belonging to family Fabaceae. Its leaves are medicinally exploited to treat several diseases and disorders. The leaves ofAbrus precatorius L. are medicinally important and are used as or to cure Acne sores, Anti-suppurative properties, Boils (Nadkarni, 1908), Anti-emetic, Asthma, Chest pains, Cuts, Gonorrhea (Hedberg et al, 1983), Aphrodisiac in males, Childbirth in females (Kerharo and

Bouquet, 1960), Astringent, Cough (Longman, 1996), Cold (Patel, 2004), Eye diseases (Trivedi, 2002; Jain and Varma, 1981), Horsed voice (Billore and Chandhari, 2004), Leprosy (Sanghi and Kumar, 2002), Nerve tonic and nerve diseases, Paralysis (Sharma and Kumar, 2001). Being a famous drug there are very chances of adulterations in drug. The adulterations may by deliberate or happened unknowingly. The leaves are often adulterated with other leaf samples. During present investigation an attempt was made to standardize the leaves of Abrus precatorius L. by using various parameters like anatomy and dermatology of leaves and phytochemical characters of leaf powder.

Materials and Methods

The leaf samples were collected from the medium sized authentically identified plant species from different localities of Marathwada. The leaves were removed carefully by hand pricking without damaging the plants. The leaves were collected in polythene bags and brought to the laboratory within 2-5 hours. Some leaves were preserved in 70% alcohol for their dermatology and anatomical work. Other were initially dried in shade and later in oven at 60^{o}C till constant weight, then made in to fine powder and stored in sealed plastic container for further analysis (Gambhire, 2008). Morphological and anatomical features of fresh and dried leaves were studied (Metcalf and Chalk, 1950; Esau, 1960; Eames and Mac Daniels, 1992)

Results and Discussion

A) Anatomy

The transverse section of leaflet shows dorsiventral structure. The epidermis of both surfaces is single layered. Cells are squarish to rectangular covered externally with cuticle. The upper epidermis cells (13.32 X 8.325 to 19.98 X 16.65µ) are slightly bigger in dimension then lower epidermis (4.99 X 6.66 to 9.99 X 13.32µ). The stomata are anomocytic and confined to lower epidermis only (Table 02).

Mesophyll is differentiated into 2 region viz. palisade and spongy parenchyma. Palisade tissue is one row of elongated chloroplast cells containing cells (9.99 X 13.32 to 16.65 X 19.98µ) on upper side. Spongy tissue is loosely arranged with intercellular spaces on the lower side. The spongy mesophyll cells (16.65 X 19.98 to 19.98 X 26.64µ) are spherical in section.

Midrib portion towards adaxial side of the leaf and epidermis is as in lamina. The strips of collenchyma appear on both epidermis and less in number below the upper epidermis than lower epidermis. The cortex is composed of parenchyma. The vascular bundle is surrounded by a

parenchymatous bundle sheath and is conjoint, collateral, closed and half moon shaped; protoxylem is facing towards upper side and metaxylem towards lower epidermis. Below the xylem on lower side lies phloem.

B) Dermatological Characters of Leaf

Leaflet shows-presence of unicellular trichomes (133.28 to 399.81µ long) on both surfaces but more common on lower epidermis.

The stomata are anomocytic, hypostomatic, with stoma length 23.32 µ (average) and 16.65 to 29.97 (range). The average size of guard cell is 16.65 X 4.995µ and range is between 13.32 X 1.665 to 19.98 X 8.325µ. Subsidiary cells are wavy in outline with average cell size 32.96 X 21.30 µ and range between 29.97 X 18.31 to 36.63 X 24.97.

In surface view the upper epidermal cells (average cell size 45.78 X 28.13µ, range 43.29 X 29.97 to 59.94 X 36.63µ) are slightly bigger in size as compared to lower epidermal cells (average size 45.78 X 28.13µ, range 43.29 X 24.97 to 49.95 X 31.63µ). Epidermal cells are wavy in outline with irregular shape.

Leaf Constants (Table 1)

Sr.No.	Leaf constant	Average	Range
1	Stomatal number lower epidermis	107.2	64 to 144
2	Stomatal index for lower epidermis	5.82	2.14 to 9.37
3	Palisade ratio	1: 6.70	1:5.75 to 1:8.00
4	Vein-islet number	11.70	8 to 16
5	Veinlet termination number	6.7	3 to 13

(Note: leaflet being hypostomatic values for Stomatal number and Stomatal index are for lower epidermis only)

C) Phytochemical Characters of Leaf Powder

a) Physical Parameters (Table2)

Sr. No.	Character	Expression
1	Colour	Green
2	Odour	Sweet
3	Taste	Sweet

b) Qualitative Analysis (Table 3)

Sr. No.	Character	Expression
1	Alkaloids	+
2	Anthraqinone	-
3	Iridoids	-

4	Saponins	+
5	Steroids	+
6	Tannins	+

c) Quantitative Analysis (Table 4)

Sr. No.	Character	Expression (%)
01	Dry Matter (DM)	59.69
02	Bulk Density	0.289 mg/cm^3
03	Nitrogen (N)	3.25
04	Water Soluble Nitrogen (WSN)	0.875
05	Crude Protein (CP)	20.31
06	Crude Fat (CFat)	15.5
07	Crude Fibre (CF)	23.20
08	Total Ash (TA)	3.78
09	Acid Insoluble Ash (AIA)	0.90
10	Acid Soluble Ash (ASA)	2.88
11	Water Insoluble Ash (WIA)	1.80
12	Water Soluble Ash (WSA)	1.98
13	Calcium (Ca)	1.45
14	Reducing Sugars	1.905
15	Non Reducing Sugars	1.105
16	Total Sugars	3.010
17	Cellulose	18.3
18	Gross Energy (GE)	3.96 Kcal/gm
19	Phosphorus (P)	0.22
20	Extractive value in Water	12.8
21	Extractive value in Acetone	3.6
22	Extractive value in Butanol	4
23	Extractive value in Chloroform	2.8
24	Extractive value in Diethyl Ether	1.4
25	Extractive value in Ethyl Alcohol	7.6
26	Extractive value in Methanol	15.4
27	Extractive value in Petroleum Ether	0.6
28	Extractive value in Propanol	4.8
29	Extractive value in Toluene	1.4

All above mentioned characters were found to be diagnostic to find adulteration in the leaf drug Abrus precatorius L.

Anatomical features like single row of palisade, presence of collenchyma in the midrib, dimensions of epidermal cells are 13.32 X 8.325 to 19.98 X 16.65µ and 4.99 X 6.66 to 9.99 X 13.32µ of upper and lower epidermis can be utilized for primary screening for authenticity of raw materials. The other features like 133.28 to 399.81µ long unicellular trichomes on both

surfaces, hypostomatic, anomocytic stomata with stoma length 23.32 μ; leaf constants like stomatal number 64 to 144, stomatal index 2.14 to 9.37, palisade ratio 1: 5.75 to 1: 8, vein-islet number 8 to 16, veinlet termination number 3 to 13 (Table 1) form the criteria for the standardization of leaf.

The parameters like green colour, sweet odour, sweet taste, presence of Alkaloids, Saponins, Steroids and Tannins give preliminary idea about authenticity of drug (Tables 2 & 3) while quantitative chemical parameters like dry matter 59.69 %, bulk density 0.289 mg/cm^3, Nitrogen 3.25 %, 0.875 %, water soluble nitrogen, crude proteins 20.31 %, crude fibers 23.2 %, crude fats 15.5 %, total ash 3.80 %, acid insoluble ash 0.90 %, acid soluble ash 2.88 %, water insoluble ash 1.8 %, water soluble ash 2 %, Calcium 1.45 %, reducing sugar 1.905 %, non reducing sugar 1.105 %, total sugar 3.01 %, cellulose 18.3 %, gross energy 3.96 K cal/ gm, Phosphorous 0.22 % (Table 4) together can be exploited for making certain that raw material is genuine for predicting quantum of adulteration.

The extractive values in Water 12.6, Acetone 3.6, Butanol 4, Chloroform 2.8, Diethyl Ether 1.4, Ethyl alcohol 7.6, Methanol 15.4, Petroleum ether 0.6, Propanol 4.8, Toluene 1.4 are conclusive parameters (Table 4).

References

- Ambasta, S.P., 1986 Ed. " Useful plants of India", Publications Div., CSIR, New Delhi, India.
- Ayucare, 2006, www.ayucare.com, "Herbs Dictionary", Html Viewed on 01-02-2007.
- Billore K.V. and Chandhari B.G., 2004, "Some pharmaceutically important wild Medicinal plants of world forestry", Arboretum, Jaipur (Raj). Agrobios newsletter vol.II, issue 10.
- Eames A. and Mac Daniels S.L., 1992, "An introduction to plant Anatomy", Tata Mc Graw Hill Publishing com. Ltd. Bombay.
- Esau Katherine, 1960, "Plant Anatomy", John wiley and sons, lnc, New York, London.
- Gambhire V. S., 2008,"Standerdization of Ayurvedic drugs- I Leaf drug studies in Marathwada", Ph.D. Thesis submitted Dr. B.A.M. University Aurangabad.

- Hedberg I., Hedberg O., Mudati P. J. , Mshigeni K. E. , Mshiv E. N. , Samuelsson g., 1983, " Inventory of plants used in Traditional Medicine in Tanzania , Part III, Plant of Families Papilionaceae , Vitaceae ", J. Ethanopharmacol, 9 (213); 237 – 260.
- Jain S.P. and Verma D.M., 1981, "Medicinal Plants in the folk lore of Northern circle Dehradun up India", Nat acad. Sci. lett. India.
- Kerharo J. and Boughet A., 1960, "Planteos Medicinales at Toxiques che la cote - D" Ivoire- Hautevolta, Vigot Freres, Paris; 297PP.
- Kirtikar K.R. and Basu B.D., 1918, " Indian Medicinal plants", Second ed. 1933. Revised ed. 1975. Lalit Mohan Basu Publication , Allahabad.
- Longman orient 1996, "Indian Medicinal Plants, a compendium of 500 species", Vidyaratham Variers P.S. arya. Vaidhya sala Kottakkal.
- Metcalf C.R. and Chalk L., 1950, "Anatomy of Dicotyledons," Oxford, Clarendon press, London
- Naik V.N.,1998,"Flora of Marathwada", Amrut Prakashan, Auranagabad.
- Naik V.N., 1998, "Marathwadyatil Samanya Vanaushadhi", Amrut Prakashan, Aurangabad, (M.S.), India.
- Nadkarni K. M. 1908, "Indian Materia Neesa Vol. I and II", second ed. 1927, third ed. 1954, Popular Prakashan Pvt. Ltd., Bombay, India.
- Patel P.K., 2004, "Ethno Medicinal study of Patan District, North Gujarat", Agrobios News letter, Vol II.
- Sanghi S and Kumar A., 2002, "Characterization of the some Ayurvedic Medicinal Plants of Family Fabaceae used for Leprosy", International Journal Mendel Vol. 19 1-2); 13-14.
- Sharma R., 2004, "Agro-technique of Medicinal Plants", Daya Publishing house Delhi, India.
- Sharma V. and Kumar A., 2001, "Ayurvedic plants for cure of Hepatic diseases", International Journal Mendel Vol. 18 (1-2)
- Trivedi P.C., 2002, " Ethno botany", The Diamond printing press, Jaipur.
- Uma Devi, A. J. 1988, "Identification of status survey of Medicinal plant", of Gujarat. Thesis submitted to the S. G. University, Surat.

24. Phthalimide Derivatives: An Advance Research Review

Kasar Madhukar
Department of Chemistry, SJJT University, Jhunjhunu, Rajasthan, India.

Abstract

Phthalimides are lipophillic compounds that can cross biological membranes and shows various biological activities. Recent advances are described in present review as a scaffold to design new prototypes drugs.

Keywords- Phthalimides , Anti microbial, Anti convulscent, Anti Viral, Anti tumor, Anxiolytic, Glucosidic inhibitor

Introduction

Phthalimides have –CO-N(R)-CO- with an imide ring. These are biologically active compounds of pharmaceutical uses. These are androgen receptor antagonists (Sharma et al, 2012) anticonvulsant (phathalate katharia; 2012) antimicrobial (khidre et al, 2011): hypogycaemic (mbakri et al, 2012); anti inflammatory (lima et al, 2012) anti tumour (Noguchi et al 2012); anxiolytical (yosuva et al 2012) and also have anti HIV-1 activities (Sharma et al, 2010).

Structure

Phthalimides are one of the imido derivatives of phthalic acid by nature they are hydrophobic, neutral and can cross biological membranes. In vivo phthalimides are closer to structure with acid anhydrides (Azzawi and Razzak,2011) most of compounds in this category are cyclic and derived from dicarboxyllic acid. Imides –NH are one of the highly polar entity, so exhibit good stability with polar solvent and NH center can form H-bonding.

Perimiation through cell membrane can be enhanced by process of chelation which enhances the lipophilicity or hydrophobicity of metal chelate. This chelates can hinder the growth of microorganism through respiration and protein synthesis restrictions. The high electron density available on the amino group nitrogen helps its co-ordination to a metal ion. (Ramesh et al, 2012).

Phthalimide moiety acts as protected form of ammonia. Phthalimides and N-substituted

phthalimides are important class of compounds as they have significant biological activities with some specific features as hydrophobic aryl ring; H-bonding domain electron donar group; and distal hydrophobic site (Bhall, omar 2011) cardioselective β- adreriergic receptor binding affinity (Jindal et al, 2005).

Chiriae et al (2007) reported a mechanism for attack of $-NH_2$ group to anhydride moiety .

Antimicrobial Activity

Various biological activity of N-alkyl and N-alkoxy phthalimides have been reported for fungicidal action by (pawar et al 2012). The compounds have been used as pesticides and pharmaceuticals purpose.1, 2, 4- triazolinone derivatives are found to have antitubercular activity as reported by Atukuri et al., (2011).

Alkoxy derivatives of phthalimides have capacity to inhibit the growth of plasmodium falciparum. All the compounds in this series are found to have poptent antituberculosis activities.All compounds were evaluated against Mycobacterium tuberculosis. The synthesized compounds were tested for their biological activity against various bacteria and fungi.They suggested that the lead compounds have the potency in the treatment of tuberculosis and multi-drug resistant tuberculosis.

Anticonvulsant Activity

1, 3, 4-oxadiazole derivatives of cyclic phthalamide have been reported as anticonvulsant and neurotoxicity. Furthermore para methoxy derivatives in this series at distal position are found to have most potent anticonvulsant activity. These Compounds have been tested for MES test. Therefore can be used in various type seizures further more modifications in compounds Can enhance the anticonvulsant activity due to the extra vander wal forces contributes. In this series nitro substituted compounds at ortho position of distal aryl ring have been reported as the most anticonvulsant agent and minimum neurotoxicity. For phthalamides N- phenyl benzene sulphonamide derivatives has also been reported to possess anticonvulsant activity which have been well established by MES test. More ever substitution in phthalamides series of aniline derivative showed least activity where as 4- nitroderivatives have been found to have potent anticonvulsant activity.

Anxiolytic Activity

Some novel nitro phathalamides as N –benzoyl 3 nitro pthalamide shows anxiolytic activities but weaker than that of the diazepalm. Electron withdrawing group at Compound[7] of

benzoazines is an essestial for anxiolytic sedative activity of benzdiazopins. This activity is reduced when substitution take place on another position (C7, C8, C9) at benzdiazepins. This can be attributred due to steric hinderance experienced by electron withdrawing group (NO_2) at active site.

α- Glucosidase inhibitory activity

Some of the phthalimides compounds also exhibit potent glucosidase inhibitory activity. N-Phenyl 3,4,5,6 tetrachloro phthalamide (N4- phenyl butyl) are the compounds reported by (Ibrahim et al 2009). Increasing the lipophilicity of molecule and halogen substitution in the aromatic ring attached to phthalamide nitrogen atom can increase the potency of such phthalamide derivatives. Some α- glucosidase inhibitors with various substituted phenoxy ring connected with phthalamide moiety reported by (pascal et al 2010).

α-glucosidase is the enzyme which catalyses the digestive process of carbohydrates. Therefore α-glucose inhibitors can show down the process of D-glucose libration from oligisaccarides and disaccharides of dietry carbohydrates leading to the delayed absorption of glucose further more this results into this postprandial hyper is suppressed manner phenyl alkyl tetra chloro phthalamide derivative compounds exhibit such kind of potent α-glucosidic inhibition activities.

It has been established that intermolecular distance between phenyl moiety And phthalamide ring the positive influence of –I effective group attached with phthalamide moiety affacts the activity of whole some molecule. Large number of compounds with different non substituted phthalamide moiety has been prepared to investigate the structural activity relationship and to improve inhibitor activity. Substitution affects the aryl alkoxy moiety. Naphthalene length between the phthalamide group and phenoxy moiety has been found to be enhanced with the increase in methylene length (N=10) substitution with chlorine atom at para position results into the increase in inhibitory activities of molecule furthermore the introduction of additional methyl group at ortho position also showed the same results.

Anti Inflammatory Activity

Amino acetylenic isoindoline derivative has been reported for significant anti inflammatory activity by (Jainen et al 2011). Pthalamide analogues with a phenyl and alkaline moiety prepared by (stivan et al 2011).

Conclusion

Non Aromatic Heterocyclic Phthalimides has been established a very significant class of organic compounds providing a wide scope of medicinal applications. Phthalimides are also being used as precursors and intermediate compounds for various phamacophore molecules. Recently Phthalimides have been reported for significant biological activities. Moreever attention has been noticed due to their significant antimicrobial, antifungal, analgesic, antitumor, anxiolytic and antiviral (HIV) actions.This review presented herein paper highlighted the important and exclusive class of heterocyclic. These heterocyclic can be used for a wide range of diseases treatment playing an important role in medicinal chemistry. The recent therapeutic profile of phthalimides amy pave a new way for the new drug development and moreover review will provide attention for research.

References

- Al-Qaisi JA, Alhussainy TM, Qinna NA, Matalka KZ, Al- Kaissi EN, Muhi-Eldeen ZA. Synthesis and pharmacological evaluation of aminoacetylenic isoindoline-1,3-dione derivatives as anti-inflammatory agents. Arabian J. Chemistry, 2011,4,1-7.
- Arti Kumar S, Pathak D. Synthesis and Anticonvulsant screening of 4-Phthalim-ido – N-(4'- substitutesd Phenyl benzene sulphonamide, 4-Succnimido-N-(4'-substituted Ph-enyl) benzenesulphonamide. Int. J. of PharmTech Res., 2011, 3, 2104-2110.
- Atukuri D, Kattimani P, Kamble R. Mg $(ClO4)2$ catalyzed eco- benign synthesis of 1, 2, 4-triazolinone derivatives as anti-tubercular agents. Organic communications, 4, 94-104, (2011).
- Azzawi AMA and Razzak MSA. Synthesis, Characterization and antibacterial activity of Several New Schiff Bases Linked to Phthalimide Moiety. Kar. J. Pharma. Sci., 2, 2011, 124-133.
- Bansal R, Karthikeyan C, Moorthy NSHN, Trivedi P. QSAR analysis of some phthalimide analogues based inhibitors of HIV-1 integrase. ARKIVOC, 2007, 15, 66-81.
- Chan SH, Lam KH, Chui CH, Gambari R, Yuen MC, Wong RS, Cheng GY, Lau FY, Au YK, Cheng CH, Lai PB, Kan CW, Kok SH, Tang JC, Chan AS. The preparation

and in vitro antiproliferative activity of phthalimide based ketones on MDAMB-231 and SKHep-1 human carcinoma cell lines, Eur. J. Med. Chem., 2008, 44, 2736-2740.

- Chiriac CI, Nechifor M and Tanasa F, Marioara N et al., Formamide, a novel challenging reagent for the direct synthesis of non -N- substituted cyclic imides, Rev. Roum. Chim., 2007, 52, 883–886.
- EFSA (European Food Safety Authority), 2013, EFSA Journal, 2013, 11(12):3510, 1-33.
- Hassanzadeh F, Rabbani M, khodarahmi GA et al., Synthesis of phthalimide derivatives and evaluation of their anxiolytic activity. Res. in Pharma. Sci., 2007, 2, 35-41.
- Ibrahim A A I, Fathalla W. Synthesis of N-substituted-3,4,5,6 - tetra chloro-phthalimide using trichloroacetimidate C-C bond formation method. ARKIVOC, 2009, 8, 193-199.
- Jindal D P, Singh B, Coumar M S. Synthesis of 4-(benzamide)- and 4-(phthalimide)-substituted phenoxy propanolamines and their β1-, β2-adrenergic receptor binding studies, Indian J. Chemistry, 2005, 44B, 1441-1445.
- Kathuria V, Pathak D P, Synthesis and anticonvulsant activity of some N-substitutedphthalimide analogues, The Pharma Innovation, 2012, 1, 55-59.
- Sukhbir L. Khokra, Kanika Arora, Heena Mehta, Ajay Aggarwal and Manish Yadav. Common Methods to Synthesize Benzo- thiazole derivatives and their Medicinal Significance: A Review, Int. J. Pharm. Sci. Res., 2011, 2, 1356-1377
- Mbarki S, Elhallaoui M. 3D-QSAR for α-Glucosidase inhibitory activity of N-(phenoxyalkyl) phthalimide derivatives. IJRRAS, 2012; 11, 395-401.
- Nagarajan S, Majumder S, Sharma U, Rajendran S, Kumar N, Chatterjee S, Singh B. Synthesis and anti-angiogenic activity of benzothiazole, benzimidazole containing phthalimide derivatives, Bioorg. Med. Chem. Lett., 2013, 23, 287–290.
- Okunrobo LO, Usifoh CO, Scriba GKE. Synthesis and Pharmacological Evaluation of 2 -hydroxy methyl benzamides as Anti- inflammatory and Analgesic agents. Acta Poloniae Pharmaceutica, 2006, 63, 25-31.

- Pascale R, Carocci A, Catalano A, Lentini G, Spagnoletta A, Cavalluzzi MM, De Santis F, De Palma A, Scalera V, Franchini C. New N-(phenoxydecyl)phthalimide deriva -atives displaying potent inhibition activity towards a-glucosidase. Bioorg. Med. Chem., 2010, 18, 5903-5914.
- Ramesh M, Sabastiyan A. Synthesis, Characterization and Antimicrobial Studies on a New Mannich Base N- (Morpholinomethyl)phthalimide and its Zinc(II), Cadmium(II) and Mercury(II) Complexes. Der Chemica Sinica, 2012, 3(5): 1297-1304.
- Santos JL, Yamasaki PR, Chin CM, Takashi CH, Pavan FR, Leite CQ. Synthesis and in vitro anti Mycobacterium tuberculosis activity of a series of phthalimide derivatives, Bioorg. Med. Chem., 2009, 17, 3795–3799.
- Wu JJ, Huang DB, Pang KR, Hsu S, Tyring SK. Thalidomide: dermatological indications, mechanisms of action and side-effects, British Journal of Dermatology, 2005, 153, 254–273.
- Yang Y, Zhao JH, Pan XD, Zhang PC. Synthesis and Antiviral Activity of Phthiobutazone Analogues. Chem. Pharm. Bull., 2010, 58, 208-211.

25. Physico-Chemical Assessment of Ground Water Quality within Dhule City of Maharashtra, (India)

R. C. Chautmal
Department of Chemistry, GET's Art's Commerce and Science College, Nagaon (India).
V. B. Jadhav
Department of Chemistry, JET's Zulal Bhilajirao Patil College, Dhule , (India).
T. J. Patil
Department of Chemistry, JET's Zulal Bhilajirao Patil College, Dhule, (India).

Abstract

The Ground water samples of some selected locations in Dhule city were analyzed with respect to Physico-chemical parameters in order to determine the potability of the water. These Physico-chemical parameters of ground water were use to analyze and evaluate potability of water for consumption and its impact on human health. Evaluated data of the analysis were compared with the standards given by WHO and ISI. The present study revealed that there are variations in many Physico-chemical parameters on the basis of sample location of selected sites. The sample S-1, S-2 and S-3 were found within the possible limits whereas S-4 shows large variations and found to be exceeding their acceptable limits of standards indicating poor potability due to contamination from sewage and humus.

Keywords: Ground water, Physico- chemical Parameters, Potable water, permissible limit.

Introduction

The quality of water is of vital concern for human being because it sustain life. Polluted water responsible for water born diseases, epidemic and is still looming large on the horizon of developing countries such as India **[1].** Due to rapid industrialization, civilization and subsequent contamination of surface and ground water sources, water conservation has reached to the alarming stage **[2]**, which made essential to monitor underground water quality with all aspects into consideration. However with increase in demand due to increased population this source is nowadays over exploited in many parts of the earth **[3].** The main objective of the present study is the evaluation of Physico-chemical aspects of ground water from some selected locations within Dhule city, to specify accurate and timely information regarding the potability of open

well water samples. The present findings may be helpful to shape sound public policy and to implement water quality improvement program effectively as well as efficiently.

Study Area

The Dhule city is divided into two main zones viz. Deopur and Dhule city which is separated by a river PANZARA. Both these areas are residential and commercial zones of major population. Many House-hold industry effluents and urban sewage were continuously added through open as well as closed drainage into the river without any proper effluent treatment. Human population residing in these zones utilizes ground water for their daily needs. Since fast extension and development of Dhule city Municipal Corporation fails to supply potable water. Present Sampling locations were selected on the basis of the detailed survey of the study area and discussions with local experts from water department of Municipal Corporation. The detail regarding the locations is given in Table 1.

Table 1: Details of Sampling Locations

Sample No.	Name of Location	Zones
S-1	Forest Colony	Deopur
S-2	Walwadishivar, Near Homegaurd office	Deopur
S-3	Phule Colony	Dhule
S-4	Varkhede Shivar	Dhule

The duration of sampling is during the months of October 2015 to January 2016. All the samples were collected in clean polythene cans of one litre capacity and brought to the laboratory without the addition of any preservatives and subject to the physico-chemical analysis within 24 hours after collection. Suspended matters if any, in these samples were removed by filtration through the Whatman filter paper No. 41. All chemicals used were A.R. Grade; Double distilled water was used for the preparation of various solutions.

Experimental

The samples collected were subjected to various Physico-chemical analyses in order to assess their quality and potability. Water samples were analyzed using standard methods **[4-6]**. Physico-chemical parameters such as pH, Electrical Conductivity, Total Dissolved Solids, Dissolved Oxygen, Total Hardness, Sodium, Potassium, Calcium, Magnesium, Chloride and Sulphate were determined using standard methods **[5]**.

Results and Discussion

The values obtained for various Physico-chemical parameters after analytical determination are given in Table 2.

Table 2: The Average Values of Physico-Chemical Parameters in the Study Area

Sample	PH	EC	TH	DO	TDS	Na^+	K^+	Ca^{++}	Mg^{++}	Cl^-	SO_4^{2-}
S-1	7.9	1122	248	4.8	376	88	2.4	68	47	193	38.8
S-2	8.0	1279	335	5.7	425	92	3.1	73	39	260	46.9
S-3	8.1	1387	362	5.0	308	77	3.6	69	51	223	56.7
S-4	8.4	4034	803	3.3	728	359	7.3	194	211	315	94.6

(All Values in ppm except pH and for EC µmho/cm)

The values were compared with the standard values given by WHO **[7]** and ISI **[8]** as given in Table 3.

Table 3: WHO, ISI and ICMR Standards for Potability

Parameter	ISI Maximum Permissible Limits	WHO Guidelines
PH	6.5 – 8.5	7.0 – 8.5
EC	250	300
TDS	500	500
DO	5.0	5.0
TH	300	600
Na^+	-	250
K^+	45	45
Ca^{++}	75	200
Mg^{++}	30	30
Cl^-	250	250
SO_4^{2-}	150	400

(All Values in ppm except pH and EC)

All the four samples were not having any objectionable colour appearance, taste or odour. The PH is measure of acidity or alkalinity. The PH values of water samples analyzed vary from 7.9 to 8.4 and were found to be within the permissible limits. The Electrical conductivity (EC) is an index to represent the total concentration of dissolved salts in water. This is confirmed by the fact that these samples were found to have fairly high values of TDS also. It is observed that water with high values is predominant in sodium and chloride ions **[9]**. When the concentration of both the ions was considered together, all the samples with high EC were found to have both the ions at higher concentration. The EC variation in the sample analyzed is shown in Fig. 1.

Total Dissolved Solids (TDS) of the sample analyzed varies from 3.3 to 5.7 ppm. Among these samples; S-4 has its TDS value above permissible limits. The higher value of TDS could be due to low water levels within aquifers and sediment effect **[10]**. The trend of TDS variations is shown in Fig. 2. The consumption of water having high dissolved solids and hardness may cause (Dotted line indicates permissible limits) harmful effect like kidney stone formation and other related diseases.

Dissolved Oxygen (DO) in the water is essential to aquatic life. It is important pollution parameter in water assessment and reflects the physical and biological processes prevailing in the water. The DO of sample S-4 is below the permissible limits indicating heavy contamination due to organic matters. The Total Hardness (TH) of water samples analyzed varies from 248 to 803 ppm which is higher than the permissible limits. The calcium content varies from 68 to 194 ppm except for sample S-4 which is within the permissible limits.

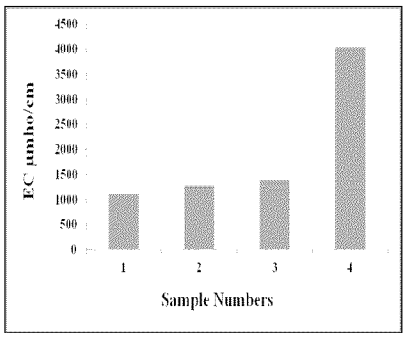


Fig. 1: EC in the water samples

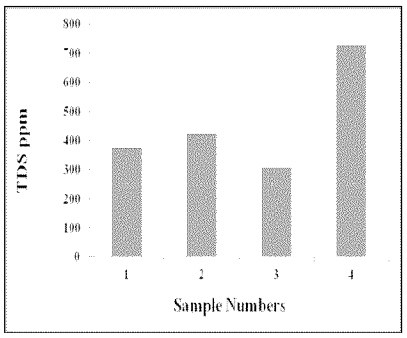


Fig. 2: TDS in the water samples

The concentration of sodium and potassium were found within the permissible limits. The chloride concentration of the water samples analyzed shows variation. The values for sample S-4 are quite above their permissible limits; usually chloride imparts salty taste to the water for the people who are not accustomed to high chloride concentration in water are subjected to laxative effect. The Sulphate content of the analyzed water samples was found to be within the permissible limits. These values vary from 38.8 to 94.6 ppm.

Conclusions

The overall findings of the present work imply that the quality of the water samples S-1 (Forest Colony), S-2 (Walwadishivar, Near Homegaurd office) and S-3 (Phule Colony) have good potability indicated as all Physico-chemical parameters below the permissible limits. However water sample S-4 (Varkhede shivar) have inferior potability due to contaminations from house hold industries and sewage. Among these four water samples, S-4 (Varkhede shivar)

is highly polluted and not suitable for drinking purpose and hence at the onset some suggestions are made from our side that there should be proper management of sewage contaminations as well as the open well water of study area should be pre-treated to make suitable for drinking and to maintain proper health conditions of people living in these study zones.

References

1. Sharma B. K. , (2001) Water pollution , Goel Publishing House, Meerut
2. Palanisami P N ,Geeta G A.,sujatha M,Sivakumar P and Karunakaran K, E Journal of Chemistry, 4(3): 434 (2007).
3. Manzoor S , Munir shah H, Shaheen N and Khalique A, J Hazard Mat. 137(11): 3(2006).
4. APHA, Standard Methods for examination of Water and Wastewater, Washington D C 18th Ed 1992.
5. Manivasakam N, PhysicochemicalExamination of Water, Sewage and Industrial Effluents: 5th Ed. Pragati Prakashan, Meerut (2005).
6. Kotaiah B and Kumarswamy N, Environmental Engineering Laboratory Manual,1stEd Chaotar Publishing House Pvt, Ltd.India.
7. WHO, International Standards for Drinking Water, Geneva: (1971).
8. ISI, International Standards of Water Quality for Drinking Water IS: 10500, 1983.
9. Freeda Gnana Rani D, J Environ Sci Engg., 48(3): 199 (2003).
10. Damodaram T and Suresh S, Pollut Res., 24(1): 217(2005).

26. Physico-Chemical Study of Dam Water from Akkalpada (Lower Panzara) Dam in Sakri Tehsil

Mr. Gawai U. B.
Dept. of Chemistry, Late Annasaheb R.D. Deore Arts and Science College Mhasadi.
Dr. S. S. Nandre
Dept. of Chemistry, Late Annasaheb R.D. Deore Arts and Science College Mhasadi.

Abstract

There is no imagination of life without water, it plays important role in living system. Hence there is great attention on study of analysis of water to ascertain that to determine suitable for consumption. The ground water quality is determined from different sites in ten samples that lie in Akkalpada dam region of Sakri tehsil in Dhule district (MS). In physico-chemical analysis various parameters was studied like pH, Turbidity, Electrical conductivity, TDS, TH, TA, BOD, COD etc, out of which only physical parameters are studied in this paper.

Key Words: Ground water, pH, TDS, Akkalpada dam.

Introduction

Without water there is no life. The fresh water is most precious thing which is essential for life (1). Water is the most widely present and abundant substance found on the earth, and main thing is that our planet is wash with water, in total there is 1400 million billion liters of water but most of this water is cannot be used for drinking because 97% is sea water and only 3% is fresh water, out of which 2% is ledged in the polar ice caps and glaciers. Only 1% of water available for portable use, where as more water is utilized for irrigation than drinking, sanitation and all other use (WHO-2004) Along with it is used for food product, industrial, waste disposal and for agriculture (2-3). Due to the urbanization and industrialization there is spoil of water take place, for agriculture tremendous amount of water is required in rural area where there is no alternatives like dam, river, or canals . During last two decades the level of ground water decreases dramatically because of exploration of human intervention and therefore water borne diseases has been seen which cause health hazards. The physico-chemical study of water in the given region is great aspect of aquatic environmental chemistry in which the study of sources, composition, reaction and transportation of water occurs. The quality of water is highly

concerned with human being and is directly linked with human welfare (4-6). The present work is an attempt to measure the quality of various sample of water from Akkalpada dam region of Sakri tehsil in Dhule district (MS)

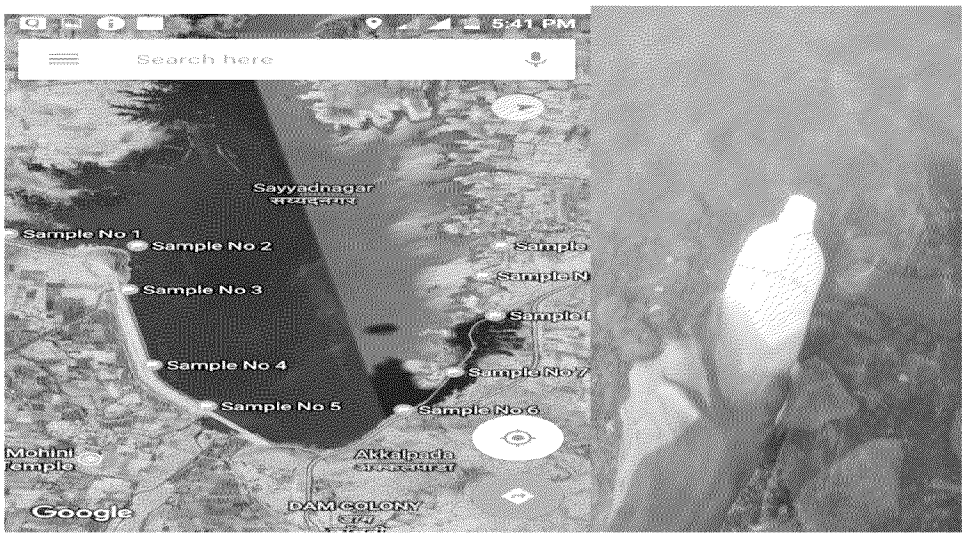
Experimental

Study Area

The study area comprises of Akkalpada (Lower Panzara) Dam in Sakri tehsil, Dhule district of Mharashtra. The area is situated on the Panzara River. The samples of water collected from Akkalpada (Lower Panzara) Dam. In the present study only physical parameter of water samples taken from given Dam water are studied. The location is sample studied is given as:

Sample No.	Latitude	Longitude
1	$20^0 56' 08.6" N$	$74^0 25' 59.3" E$
2	$20^0 56' 28.6" N$	$74^0 25' 07.5" E$
3	$20^0 56' 23.6" N$	$74^0 26' 22.4" E$
4	$20^0 56' 23" N$	$74^0 26' 49" E$
5	$20^0 56' 29.8" N$	$74^0 27' 05.2" E$
6	$20^0 57' 01.3" N$	$74^0 27' 2.8" E$
7	$20^0 57' 11.6" N$	$74^0 27' 01.4" E$
8	$20^0 57' 21.6" N$	$74^0 25' 43.2" E$
9	$20^0 57' 22.1" N$	$74^0 26' 29.1" E$
10	$20^0 57' 26.8" N$	$74^0 26' 19.4" E$

Water Sampling



In the present study the water samples were collected in the month of October 2018 in polythene bottles which are cleaned with acid water and again with distilled water (7). The analysis is carried out with standard method.

Methodology

The P^H, EC, TDS was measured using soil and water analysis kit. Turbidity with Digital Turbidity meter.

Table1: Study of Physical Parameter of Dam Water Samples

Sr. No.	Sample No	Temperature At the time of sampling	Temperature At the time of Analysis	P^H	EC	TDS	Turbidity
1	1	28	27.2	8.22	273	180	2
2	2	27	27.5	8.10	274	181	3
3	3	27	26.7	8.18	275	182	1
4	4	26	26.6	8.20	269	178	2
5	5	24	26.9	8.07	278	185	3
6	6	26	26.8	8.10	274	181	2
7	7	28	26.8	8.28	274	181	3
8	8	28	27.8	8.15	276	183	2
9	9	29	27.9	8.20	274	181	2
10	10	31	27.4	7.97	278	183	3

Table2: Comparison of Dam Water at the Study Area with Standard Value

Sr. No	Parameter	Minimum	Maximum	Mean	ICMR(Desirable limit)
1	P^H	7.97	8.28	8.0	7.0-8.5
2	EC	269	278	273.5	-
3	TDS	178	185	181.5	500
4	Turbidity	1	3	2	5 NTU

Table No: 3 Classification of Well Water Sample on the Basis of TDS

Sr. No	Classification of Water	TDS(Mg/l)	No. of sample
1	Non Saline	< 1000	10
2	Slight saline	1000-3000	Nil
3	Moderate saline	3000-10000	Nil
4	Vary saline	>10000	Nil

Table No: 4 Desirable Limits of Physical Parameters

Parameter	B.I.S		I.C.M.R		WHO	
	Highly Desirable	Max. Permisible	Highly Desirable	Max. Permisible	Highly Desirable	Max. Permisible
EC	No desirable standard					
TDS	500	1500	500	1500	500	1500
P^H	6.5-8.2	6.5-9.2	7-8.5	6.5-9.2	7-8.2	6.5-9.2

1. pH

The pH of given sample at any temperature represent the potential of hydrogen ion concentration which can be measured quickly. It plays an important role in environmental engineering for water supply, water softening and disinfection and corrosion control.

Low pH affects the corrosion, high pH cause taste, soapy feel and pH greater than 8 is preferable for the effective disinfection with chlorine (Maiti 2004). Wetzel (1995) reported that the value of pH ranges from 8 to 9 unit in Indian water (Sisodia &Maundiotiya 2006). The average pH of ground water in Dhule district is around 8 slight alkaline.

2. Electrical Conductivity

The Electrical conductivity is ability to carry current due to the presence of ions such as Cl^-, SO_4^{--}, CO_3^-, HCO_3^-,NO_3^-, Ca^{++}, Mg^{++}, Na^+ and K^+ are responsible for carry electric current.

Sr.No	Type	EC	No of samples
1	Excellent	<250	00
2	good	250-750	10
3	Doubt	750-2250	00
4	Unsuitable	>2250	00

As per the EC there is no sample belongs to the excellent category. All samples has good category as per EC.

3. Total Dissolved Solids (TDS)

Natural water contain uncountable solids such as Cl^-, Fe, SO_4^{--}, CO_3^-, HCO_3^-,NO_3^-, Ca^{++}, Mg^{++}, Na^+ and K^+. Simply TDS can be express as sum of the cations and anions concentration expressed in mg/l. Cl^- is major inorganic constituent in natural water (Maiti-2004).It may come from soil, rocks, discharge of agriculture, industrial and domestic waste water.

Distribution of TDS of Dam Water

Sr.No	Range	Type	No of samples
1	<300	Low	10
2	300-600	Average	00
3	>600	High	00

Result and Discussion

The water samples of both drinking and well from the study area has no colour, odour and taste. The taste of the water sample almost all location is pleasant in taste. The study of physical parameters of given water sample are given in table. All water samples are compared with standards is given by WHO. The pH of water sample shows variation in its range which indicate they are in the range of quality parameter permissible limit. The EC of water shows low variation in all samples of all sites. TDS also shows variation in its range out all these samples all samples are in desirable limit.

Conclusion

In the present study of ground water (Dam Water) which people are used to consume and irrigation in the given study area, the result of chemical analysis of sample water shows considerable variation. Almost all of the water samples comply with ICMR and WHO standard for drinking purpose. The water quality in the investigated area is found to be suitable for drinking in all the locations. It need not requires regular chemical analysis to ensure that the quality of water is not contaminated.

References

1. Neerja Kelra, Rajesh Kumar, S.S Yadav and R.T Singh. Journal of Chemical and Pharmaceutical Research, 2012,4(3):1827-1832.
2. World Health Organization (2004).WHO guideline for drinking water quality.3rd edition, Geneva, pp3-6.
3. A.Khalid, A. H. Malik, A. Waseem, S. Zahra and G. Murtaza. International Journal of the Physical sciences vol. 6(33), pp7480, 9 Dec, 2011.
4. A. Agarwal, C. Sharma, State India Freshwater,A Citizen Report Centre for Science and Environment, New Delhi, 1982.
5. L. Claessens , C. Hopkins, N. Rastetter., J. Vallino, Water Resources Research, 2006, 42, 03426.doi: 10.1029/2005WR004131.

6. S.S. Yadav, Rajesh Kumar, Rasayan J Chem, 2010,3(3), 586-596.
7. K. Karunakaran, P.Thamilarasu, R. Sharmila, E-J. Chem., 2009,6(3)909-914.
8. M. M. Weldemmariam., International journal of scientific and research publication, volume 3, Issue 11, Nov. 2013.
9. Nidhi Sexsena, S. N. Mishra, J. Chem.Pharma. Res., 2011, 3(2)162-167.
10. S.S.Yadav, R. Kumar, Ultra Chemistry, 2010,6(2)181-186.
11. M. Shah, Poll. Res., 2006, 25(3)549-554.
12. M. K. Bhutra, A. Soni, J. Ind. Council Chem., 2008, 25(1), 64-67.
13. B. Pradhan and S. Pirasteh. The Open Hydrology Journal, 2011, 51-57.
14. U.B. Gawai and S.S.Nandre. Journal of Research and Development Feb.2018, 8(06),115-118.

27. Phytochemical Studies of Datura Inoxia Mill in Marathwada Region, Maharashtra

Jamdhade M. S.
Smt. N.N.C. Arts, Comm. & Science College, Kusumba, Tal. & Dist. Dhule (MS).
Bhuktar A. S.
Vivekanad Arts, Sardar Dalipsing Comm., & Science College, Aurangabad (MS).

Abstract

The members of Datura are well known as a poisonous as well as hallucinogenic plants, they also have some medicinal properties (Bhattacharjee et al, 2004). Datura inoxia Mill. belongs to family Solanaceae. It is an annual to perennial herb. This family is well known for their alkaloids contains. In ethnobotanical literature this genus has great medicinal importance. Attempts were made to find out the phytochemicals qualitatively and quantitatively from various plant parts like root, stem, leaves, seeds, fruit coat of Datura inoxia Mill.

Key words: Phytochemical, Datura Inoxia Mill, quantitative

Introduction

Datura inoxia Mill. belonging to family Solanaceae. In some European countries it is cultivated In India, it is grown in Bangalore, Ahmedabad, Pune, Lucknow, pilani and Jammu (Bhattacharjee and Supriya 1998). It is native to the America and introduced to Africa Asia Australia and Europe (Wikipedia, 2006). It is commonly known as Angels trumpet, thorn apple, Indian- apple, moonflower or sacred Datura.

In ancient India, Charaka and Sushruta given special place to Datura in Ayurveda. All parts of plants were used for medication, these include in the treatment of Leprosy, Rabies, insanity etc. (Bhattacharjee et al, 2004). Morphologically, D. inoxia Mill. is erect gray tomentose, much branched herb. It attends height about 60 to 90 cm, stem woody below. Its leaves are ovate unequal sided and sub-cordate at the base, sinuate –dentate, densely soft pubescent on both surfaces. Petioles are 5 to 10 cm long, tomentose flower solitary; peduncle 1-1.5 cm long; densely pubescent. Calyx is 6- 10 cm long, tubular pubescent outside; teeth triangular acute 1-2 cm long. The Corolla is pure white 10 to 12 cm, lobes deltoid acute with 5 to 6 mm long teeth alternating with them. filaments adnate to corolla tube for a considerable length.

Capsule globos, 2.5 to 3.5 cm in diameter minutely gray tomentose clothed with long slender weak spines, seeds Sub reniform, pale brown, smooth and the flowering and fruiting in September to March (Naik et al 1998).

All plant parts are anodyne, antispasmodic, hallucinogenic, hypnotic and narcotic. It used in the past as pain killer and also in the treatment of insanity, fevers, diarrhea and skin diseases (Tropical Plant database). The plant has various uses, like seed oil is used for treatment of painful joints, poultice of leaf is applied in piles and skin diseases as well as leaves are smoke for asthma. Seed extract and dry grapes used for asthma and cough (Syed et al. 2006). Leaves are applied externally on swelling of limbs, its extract is helpful in toothache and epilepsy. Leaf extract affect the nervous system overdose main induced vomiting, coma and even death. Seeds are antipyretic and narcotic. Dried leaves and seeds are used in the treatment of asthma. Plant is commercial source of scopolamine used as pre-aesthetic in surgery in ophthalmology and prevention of motion sickness (Purohit and Vyas, 2004).

Methods and Materials

Datura inoxia Mill. was collected from the various part of Marathwada region. It was collected and kept in polythene bags and brought to the laboratory. It was sorted out into root, stem, leaf, seeds and fruit coat. The plant parts where are dried in natural condition and after that it was kept in oven at 60^0C up to constant weight. After the complete drying, the plant parts cut into small pieces and ground into fine powder. It was store in the sealed container, this fine powder of the plant parts where used for the chemical analysis. The plant powder was used for various qualitative and quantitative analysis. Form the powder qualitative analysis for alkaloids, tannins, saponins and iridoids (Gibbs, 1974, Deniel and Sabnis 1979; Dhabe, 2003) was done. In quantitative analysis various parameters were studied like total Ash, acid soluble Ash, acid insoluble Ash, water soluble Ash, water insoluble Ash, calcium, phosphorus, sodium, potassium, nitrogen, crude protein, crude fiber, crude fat, gross energy, total sugar, reducing sugar, non-reducing sugar, amino acids (Mungikar, 1999) amino nitrogen, phenol, tanning, and total alkaloids (Sadasivam and Manickam, 1992).

Table No. 01: Quantitative Analysis of Datura Inoxia Mill

Sr. no.	Chemical parameters	Plant part				
		Root	Stem	Leaf	Seeds	Fruit coat
1	Total ash	19	16.6	13.1	5.7	15.2
2	Water insoluble ash	18.3	15.7	10.9	3.8	7.8

3	Water soluble ash	0.7	0.9	2.2	1.9	7.4
4	Acid soluble ash	15.5	12.1	10.6	03.2	12.7
5	Acid insoluble ash	3.5	4.5	2.5	2.5	2.5
6	Water soluble nitrogen	1.25	1.0	3.0	2.0	2.5
7	Nitrogen	1.83	1.83	4.16	2.16	1.58
8	Calcium	0.52	0.22	0.85	0.18	0.21
9	Phosphorous	0.19	0.3	0.3	0.45	0.38
10	Potassium	0.172	0.305	0.18	0.111	0.274
11	Crude fat	6	9	3.69	22.65	6.5
12	Crude protein	11.45	11.45	26.04	13.54	9.89
13	Gross energy	2.68	2.65	3.26	3.65	3.08
14	Reducing sugar	0.45	0.15	4.23	0.97	0.99
15	Total sugar	0.66	0.51	4.41	1.3	1.33
16	Non reducing sugar	0.21	0.36	0.18	0.33	0.34
17	Crude fiber	2.5	2	3	1.5	1
18	Nitrogen free extract	61.05	60.95	54.17	56.61	67.41
19	Total carbohydrate	63.55	62.95	57.17	58.11	68.41
20	Total free amino acids	0.14	0.74	1.74	0.1	0.14
21	Amino nitrogen	0.014	0.079	0.188	0.01	0.014
22	Cellulose	39.8	37.7	17.8	26.7	38.1
23	Total alkaloids	1.02	1	9.7	11.08	1
24	Phenol	0.04	0.03	0.33	0.1	0.05
25	Tannins	0.15	0.2	0.87	0.18	0.13

Table No. 02: Qualitative Analysis of Datura Inoxia Mill

Sr. no.	**Plant part**	**Chemical parameters**			
		Tannins	**Saponins**	**Alkaloids**	**Irredoids**
1	Root	+	+	+	-
2	Stem	++	+++	+	-
3	Leaf	+++	+++	+++	-
4	Seeds	++	+++	+++	+
5	Fruit coat	+++	++	++	-

Result and Discussion

Ash value is useful in determining authenticity and purity of sample and these values are important qualitative standards (Bhargava et.al, 2013). Apart from all the parameters (Table No.01) the root sample shows the high percentage of total Ash, water insoluble ash, Acid soluble

ash and cellulose. Acid insoluble ash, potassium, non reducing sugar shows maximum percentage as compared to all the parameters. Seeds contain phosphorus, crude fat, gross energy and total alkaloids in maximum amount. Nitrogen free extract and total carbohydrate were found maximum in fruit coat. Rest of the chemical parameters were found maximum the leaf power i.e. water soluble ash, water soluble nitrogen, calcium, nitrogen, crude protein, reducing sugar, total sugar, crude fiber, total free amino acids, amino nitrogen, phenols and tannin.

From qualitative analysis (Table no. 02) it is clear that, tannin saponons, alkaloids are present in all the parts of the plant, but iridoids is absent all the parts of the plant except seeds. Tannins were found maximum in leaf and fruit coat, less in root while modrate in stem and seeds. Saponin present in stem, leaf, seed sample in more amount while moderate in fruit coat and less in roots. Less amount of alkaloids found in root and stem while moderate amount found in fruit coat and maximum found in leaf and seeds.

Conclusion

From the above discussion it can be conclude that all parameters useful to determine authenticity and purity of samples. As the qualitative analysis shows that, tannins, saponins and alkaloids present in Datura inoxia Mill. more or less amount, while iridoids were absent in all parts except seeds. In quantitative analysis leaf sample shows highest amount of chemical compounds it was also confirmed by Sangekar S.N. & Devarkar V.D. (2017). All parameters can be useful in determining authenticity and purity of sample and these values are important qualitative standards.

References

- **Bhargava V.V, Saluja A.K. & Dholwani K.K.,** 2013, "Detection of heavy metal contents and proximate analysis of roots of Anogeissus latifolia." J. of Pharmacognosy & phytochemisry, Vol. 1 No.6, 61-65.
- **Bhattacharjee and Supriya kumar,** 1998, 'Hand book of medicinal plants.' Pointer publishers, Jaipur (124).
- **Bhattacharjee S., Kar S., & S. Chakravarty,** 2004, "Mineral composition of Datura: A traditional tropical medicinal plant". Comm. in soil sci. & Plant analysis, Vol. 35, (7&8), 937-946.
- **Deniel M and Sabnis S.D.,** 1979, "Chemotaxonomy of Loganiaceae" Curr. Sci. 48. 383-385.

- **Dhabe A.S.,** 2003, "Morphological, floral biological and chemical studies in relation to taxonomy of genus Alysicarpus Desv." Ph.D. thesis Vol. I & II, Dr. BAM University, Aurangabad.
- **Gibbs R.D. 1974,** "Chemotaxonomy of flowering plants." I Mc. Gill- Queens University Press, Landon.
- **Mungikar A.M.,** 1999, "Intercropping fodder crops." Saraswati Printing press Aurangabad (M.S.) India.
- **Naik V.N.**1998, 'Flora of Marathwada.' Amrut Prakashan, Aurangabad.
- **Purohit S.S. & Vyas S.P.** 2004, 'Medicinal Plants cultivation.' Agrobios (India) 399-538.
- **Sadasivam S. and Manickam A.,** 1992, "Biochemcial methods for agricultural science." Wiley Eastern Lit. New Delhi.
- **Sangekar S.N. & Devarkar V.D.,** 2017, "Pharmacognostical studies in Datura inoxia Mill." Bioscience Discovery, 8(3): 468-473.
- **Syed Rahmat Ullahshah, Gul Hassan, Abdur Rehman & Imtiaz Ahmed** 2006, 'Ethanobotanical studies of the flora of District Musakhel & Barkhan in Balochistan, Pakistan part-I.' Weed Sci. Res. 12(3): 199-211.
- **Tropical plant database,** http://tropical.theferns.info/viewtropical.php?id=Datura+inoxia
- **Wikipedia** 2006, ' Datura inoxia: http://en.wikipedia.org/wiki/datura_inoxia'

28. Preliminary Investigation on Spiders Fauna (Arachnida: Araneae) from Sakri Tahsil, District - Dhulia (M.S.), India

S. S. Patole
Professor and Head, Department of Zoology, S.G. Patil ASC College, Sakri Dist- Dhulia, Maharashtra, Sakri.

Abstract

Present study reveals on the spider fauna (Araneae) of Sakri tahsil, Dist- Dhulia (M.S.), India. The faunistic study were undertaken during 2017 and collected over more than hundreds of spider specimen which revealed total 16 species belonging to 14 genera from 9 families were reported for the first time from this region. Family araneidae (25 %) and salticidae (18.75 %) were dominant, followed by pholcidae and oxyopidae (12.5 %) each. While families thomsidae, scytotidae, sparassidae, hertilidae and lycosidae were contribute each with 6.25 %. Based on categorized of spider into habitat wise functional groups, the foliage hunters were dominating the foliage web weaver, ground runner and ambushers.

Keywords: Araneae, araneidae, salticidae, thomsidae, sparassidae, lycosidae.

Introduction

Spiders are abundant and widespread in almost all ecosystems. They plays very significant role in the ecology by being one of the exclusive predator of insect including those harmful to human being and help in maintaining ecological equilibrium (Patil et al., 2013 a). Spiders (Araneae) are air breathing arthropods that have eight legs and chelicerae with fangs that inject venom. They are the largest order of arachnids and rank 7th in total species diversity among all other groups of organism (Meshram, 2011). The world spider catalog includes around 42,751 species under 3,859 genera and 110 families (Platnick, 2012). Tikader (1987) described 1,067 species from India in his checklist of Indian spiders. Another workers viz., Siliwal et al (2005) have updated the Indian spider list with 1,442 species under 361 genera and 59 families. Later on Sebastian and Peter (2009) documented 1,520 species under 361 genera and 60 families.

Spider of protected areas in India is extensively studied by earlier workers viz., Gajbe (1995) in Indravati Tiger Reserve and recorded 13 species. Gajbe (2003) reported a checklist of

186 species of spiders in 69 genera under 24 families distributed in Madhya Pradesh and Chhatisgarh. Patel (2003) reported 91 spider species belonging to 53 genera from Parabikulum Wildlife Sanctuary, Keral. Manju et al (2003) recorded 116 species from 66 genera and 25 families from Purna Wildlife Sanctuary, Dangas, Gujarat. Bastawade (2004) described arachnid fauna of orders Araneae, Scorpionida and Solofugi from Melghat Tiger Reserve, Amravati, Maharashtra State. Quasin and Uniyal (2010) studied spider diversity form Kedarnath Wildlife Sanctuary. Sharma et al (2010) reported 44 species belonging to 12 families from Narmada River at Rajghat (Barwani, M. P.). Warghat et al (2010) deals with distribution of 76 spider species of 12 families from agriculture fields adjoining to foot hills of Satpura mountains ranges of Amravati district (M.S.). Hippargi et al (2011) reported occurrence of spiders from 19, 25 and 31 families from Lonar, Melghat and Southern Tropical thorn forest, Solapur respectively. Meshram (2011) recorded 117 spider species of 20 families and 35 genera from Toranmal Sanctuary, Maharashtra. Wankhede et al (2012) revealed 32 spider species of 7 families from Poona (M.S.) University Campus. Patil (2012) reported 117 spider species under 20 families and 58 genera from Jabalpur district (M.P.). Patil et al (2013 a) revealed 29 species belonging to 18 genera under 10 families from various localities in and around the Singhori wildlife sanctuary (M.P.). Patil et al (2013 b) reported 23 spider species belonging to 12 genera under 7 families from Rani Veerangana Durgawati wildlife sactuary, Damoh (M.P.). Deshmu kh and Raut (2014) revealed 104 species belonging to 18 families in Salbardi forest (Satpura Ranges, M.S.). Bhattacharya et al (2017) reported 24 species of spider belonging to 10 families in Jowai area (Jaintia hills) of Meghalaya. Mithali and Pai (2018) revealed 29 spider species belonging to 8 families and 19 genera and 30 species belonging to 7 families and 18 genera from site -1 and site-2 respectively from Goa. Based on Faunistic survey, present study reveals 16 spider species belonging to 14 genera under 9 families were reported for the first time from this region. The knowledge on diversity and distribution of spider from study area was absolutely scanty as compared to other part of the India mentioned above. Hence, attempt has been felt to explore spider diversity from Sakri tahsil (M.S.).

Materials and Methods

The study has been carried out during the month of March to September, 2017; from study area. It lies between 20^0 to 52^0 North latitude and 73^0 to 55^0 North longitudes in North west side of Maharashtra. Spiders were collected from different localities by active visual

search, vegetable beating, pitfall trapping, hand collection and sweep netting. The collected spider specimens were preserved in rectified spirit with few drops of glycerin was used as preservative. Before preservation photographs of natural live specimen were taken into different view and documented. The identification of specimen was done on the basis of morphometric characters of various body parts using existing identification keys (Tikader and Malhotra, 1980; Tikader, 1982; 1987). Adult spider specimens were observed under stereo zoom microscope. Identified as well as unidentified specimens were sending to Western Regional Station, Zoological Survey of India, Rawat road, Akurdi, Pune for final authetification.

Results and Discussion

Present study revealed with 16 spider species belonging 9 families with their habit, morphological characteristics and distribution are listed in table-1. Among these family araneidae (25 %) and salticidae (18.75 %) were dominant, followed by pholcidae and oxyopidae (12.5 %) each. While families like thomsidae, scytotidae, sparassidae, hertilidae and lycosidae were contribute each with 6.25 %. The reported spiders were found to be living in different types of habitats viz., ground runner, web weaver, ambusher, foliage hunter and foliage web weaver etc. No exceptionally poisonous spider was found among the species recorded from study area. The spiders are most abundant and ecological important. They are exclusively carnivorous and hence help naturally to control insect pest agro-ecosystem and indicators.

This is the first attempt in this region spider diversity were studied during the present study. Nobody has done work on such aspect. Sakri tahsil is geographically the largest tahsil in Dhulia district. It is adjoining to Satpura ranges and Dang region including Charanmal and Kondaibari forest etc having various habitats with a rich spider fauna. However, this is not an end and final conclusion regarding species richness as number of areas and habitat still to be explored. The present results indicate there is scope for further extensive studies that will generate more informative database on the spider fauna of this region.

Conclusion

- From study area, first time author reporting diversity and relative abundance of spiders which revealed total 16 species belonging to 14 genera belonging 9 families.
- Family araneidae (25 %) and salticidae (18.75 %) were dominant families.
- Family pholcidae and oxyopidae contributes (12.5 %) each.

- Families like thomsidae, scytotidae, sparassidae, hertilidae and lycosidae were contributing each with 6.25 %.
- Based on categorized of spider into habitat wise functional groups, the foliage hunters were dominating over the foliage web weaver, ground runner and ambushers.

Acknowledgement

Author is highly grateful to the Director and Scientist, Western Regional Station (WRS), Zoological Survey of India, Akurdi, Pune (M.S.) for their keen interest and constant help in identification of beetles.

References

1. Bastawade, D. B. (2004). Arachnid fauna of orders araneae, Scorpionida and Solifugi from Melghat Tiger Reserve, Dist- Amaravati, Maharashtra. In the proceeding of symposium on three decades of Project Tiger in Melghats. 8-9 Oct., PP. 70-71.
2. Bhatacharya, A., Chetri, M. and Sarkar Prabhal (2017). Spider diversity in different habitats at Jaintia hills of Meghalaya. Int. J. of Life Sci. 5(4): 613-619.
3. Deshmukh, U. S. and Raut, N. M. (2014). Seasonal diversity and status of spiders (Arachnida: Araneae) in Salbardi forest (Satpura Range), Maharashtra, India. J. Entomol and Zool Studies. 2(6): 278-281.
4. Gajbe, U. A. (1995). Spiders fauna of conservation areas: Fauna of Kanha Tiger Reserve, Madhya Pradesh. Zoological Survey of India, Publication: 27-30.
5. Gajbe, P. (2003). Checklist of Spiders (Arachnida: Araneae) of Madhya Pradesh and Chhatisgarh. Zoos. Print Journal. 18 (10): 1223-1226.
6. Hippargi, R. V., Bodkhe, A. k., Chikhale, M. P., Santape, G. P., Behere, R. M., Bolde, P. M., Manthen, S., Rao, K. R. and Shah, N. V. (2011). Spider (Arachnida: Araneae) families of three ecosystems of Maharashtra, India. E-Int. Sci. Res. J. 3(1).
7. Manju, S., Suresh, B. and Bonny Pilo. (2003). Spiders of Purna Wildlife Sanctuary, Dangs, Gujarat. Zoos. Print Journal. 18 (11): 1259-1263.
8. Meshram Archana (2011). Spiders (Arachnida: Araneae) from Toranmal sanctuary, Maharashtra, India. E-Int. Sci. Res. J. III (4): 326-334.
9. Mithali, M. H. and Pai, I. K. (2018). Distribution, diversity and ecology of spider species at two different habitats. Int. J. of Environ. Sci and Nat. Res. 8(5): 1-6.

10. Patil, Sachin R. (2012). Spiders of Jabalpur district (Arachchnia:Araneae): updated checklist-2011. Ind. Soc. of Arachnology. 1(1): 143-149.
11. Patil, S. R., Sambath, S. and Bhandari, R. (2013 a). Preliminary study on spider fauna (Arachnida: Araneae) of Singhori Wildlife Sanctuary, District Raisen, Madhya Pradesh, India. Bugs R All. 20: 8-11.
12. Patil, S. R., Sambath, S. and Bhandari, R. (2013 b). Preliminary investigation on spiders (Arachnida:Araneae) in Rani Veerangana Durgavati wildlife sanctuary, Damoh, Madhya Pradesh, India. Indian Forester, 139(10): 943-946.
13. Patel, B. H. (2003). Fauna of protected areas- A preliminary list of spiders with the description of three new species from Parambikulum Wildlife sanctuary, Kerala. Zoos. Print. Journal. 18 (10): 1207-1212.
14. Platnick, N. I. (2012). The world spider catalog. Version 12.5. American Museum of Natural History. http://research.amnh.org/entomology/spiders/catalog/index.html
15. Quasim, S. and Uniyal, V. P. (2010). Preliminary investigation of spider diversity in Kedarnath Wildlife sanctuary, Uttarakhand, India. Indian Forester. 136 (10): 1340-1345.
16. Sebastian, P. K. and Peter, K. V. (2009). Spiders of India. First Edition, University Press, Hyderabad: 1-614.
17. Sharma, S., Vyas, A. and Sharma, R. (2010). Diversity and abundance of spider fauna of Narmada River at Rajghat (Barwani) Madhyapradesh, India. Researcher. 2(11): 1-5.
18. Siliwal, M., Molur, S. and Biswas, B. K. (2005). Indian Spiders (Arachnida: Araneae): Updated checklist 2005, Zoos, Print Journal. 20 (10): 1999-2049.
19. Tikader, B. K. and Malhotra, M. S. (1980). Lycosidae (Wolf-spiders). Fauna India (Araneae). 1:248-447.
20. Tikader, B. K. (1982). Family Araneidae (Aegiopidae), typical orb weavers. Fauna of India (Araneae). 2:1-293.
21. Tikader, B. K. (1987). Handbook: Indian spiders (Anon. Ed.) Zoological Survey of India, Culcutta, pp. 251.
22. Warghat, N. E., Sharma, N. R., Chirde, S. G. and Chandrakar, M. R. (2010). Distribution of spiders from foothill agricultural fields of Satpura Mountain ranges of Amravati district, Maharashtra, India. Biosci. Biotech. Res. Comm. 3(2): 150-153.

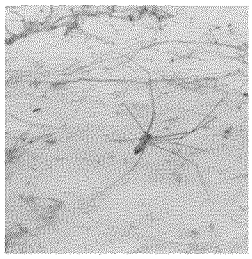
23. Wankhede, V. W., Manwar, N. A., Rupwate, A. A. and Raut, N. M. (2012). Diversity and abundance of spider fauna at different habitats of University of Pune, M. S. (India). Global Adv. Res. J. of Environ. Sci and Toxico. 1(8): 203-210.

Table-1: Taxonomic List of Spiders (Arachnida: Araneae) from Sakri Tahsil, District – Dhulia (M.S.)

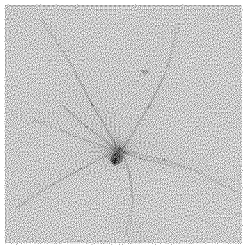
Taxa and Zoological name	Habit	Morphological characteristics and distribution
Family-Pholcidae 1. Crossopriza lyoni Blackwall, 1867	Ground runner / hunter	**Crossopriza lyoni** is a widespread species of cellar spiders that prefer to live in or around human structures. They are commonly known as **tailed cellar spiders**, **tailed daddy longlegs spiders**, and sometimes **box spiders**. They all possess extremely long fragile legs that can reach up to 6 cm (2.4 in) long and a body length of that ranges from 2.5 to 7 mm (0.098 to 0.276 in). Their abdomens are distinctly squarish when viewed from the side and their carapace is more or less circular when viewed from above.
2. Pholcus phalangioides Fuesslin, 1775	Ceiling web weaver	**Pholcus phalangioides**, also known as the **longbodied cellar spider or** the **skull spider** due its cephalothorax resembling a human skull. Females have a body length of about 9 mm and males are slightly smaller. The length of its legs is about 5 or 6 times the length of its body (reaching a legspan up to 7 cm in females).
Family – Thomisidae 3. Thomisus projectus Tikader, 1960	Ambushers	**Thomisus** is a genus of crab spiders with almost 150 species described. The genus includes species that vary widely in their ecology, but the best known crab spiders are those species that people call the **flower crab spiders**, because they are ambush predators that feed on insects visiting flowers.
Family-Oxypidae 4. Oxypes pankaji Gajbe & Gajbe, 2001	Foliage hunter	**Oxyopes** is a genus of lynx spiders found worldwide. It includes arounds 300 species and is classified under the lynx spider family Oxyopidae. Like other lynx spiders, they are easily recognizable by the six larger eyes arranged hexagonally on top of the head (prosoma), with the remaining smaller two eyes in front.
5. Oxypes chitrae Tikader, 1966	Foliage hunter	On some new species of spiders of the family Oxyopidae from India.

Family-Salticidae 6. Plexippus paykulli Audouin, 1826	Foliage hunter	**Plexippus paykulli** is a jumping spider in the family Salticidae. It is native to south east Asia but has spread to other parts of the world. In the United States it is called the **pantropical jumping spider**. It is usually associated with buildings and may be found near light sources catching insects attracted by the light.
7. Teamonia dimidiate Simon, 1899	Foliage hunter	It is a jumping spider found in various Asian tropical rain forests, in foliage in wooded environments. Since 1999, the spider has been the subject of an email hoax claiming that it was a fatal spider found lurking under toilet seats in North Florida.
8. Habrocestoides nitidus Logunov, 1999	Foliage hunter	**Habrocestoides** is a genus of the spider family Salticidae (jumping spiders). Most species are endemic to India, with H. phulchokiensis found only in Nepal. **Habrocestoides nitidus** is a spider species in the taxonomic classification of the jumping spiders.
Family-Scytotidae 9. Scytodes thoracica (Spliting spider)	Spitting spider	**Scytodes thoracica** is a spitting spider, so called because it spits a venomous sticky silken substance over its prey. Its size ranges between 3–6 mm (0.12–0.24 in). The carapace is unusual in sloping upwards towards its rear end, whereas the abdomen slopes downwards. It has six eyes instead of the eight spiders usually have.
Family-Sparassidae 10. Heterropoda venatoria Linnaeus, 1767	Foliage hunter	**Heteropoda venatoria** is a species of spider in the family Sparassidae, the huntsman spiders. It is native to the tropical regions of the world, and it is present in some subtropical areas as an introduced species. Its common names include **giant crab spider** and **cane spider.** The adult has a flat, brown body 2 to 2.5 cm long, 7 to 10 cm wide, including the legs. The female may be slightly larger than the male, particularly in the abdomen, but the male has longer legs and larger tips on its pedipalps.
Family-Araneidae 11. Eriovixia excelsa Simon,1889	Foliage web weaver	**Eriovixia** is a genus of spiders in the Araneidae family. It was first described in 1951 by Archer. As of 2017, it contains 21 species from throughout Africa and Asia. Carapace and legs brownish, colour of abdomen variable but usually brown to black. Cephalothorax narrowed in front. Ocular region slightly longer than wide. Anterior median eyes smallest. Lateral eyes closely situated on a tubercle. Sternum heart shaped, pointed posteriorly. Abdomen globular, pointed posteriorly with a black tip.

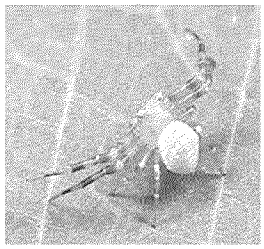
12. Neoscona theisi Walckenaer, 1842	Foliage web weaver	Spiders in the Neoscona genus have a mostly pantropical distribution. Neoscona theisi females have a body length up to 11 mm, and males are slightly smaller measuring up to 9 mm. They build an orb web and rest near the centre. Neoscona theisi vary in color from dark reddish-brown to pale-yellow with a distinct pattern on the upper abdomen, lighter along the centre-line and darker on the sides.
13. Neoscona mukerjei Tikader, 1980	Foliage web weaver	Cephalic region with 'V' shaped dark brown patch; abdomen sub-triangular in shape. Epigynal scape having deep constriction and an unclear lateral lobe. Juveniles of this species are seen at the beginning of rainy season. Females lay egg sac on ground or wall surface with debris during post rains. colour. Abdomen grey, almost triangular in shape with posterior tapering end and covered with hairs and pubescence. Legs are yellow in colour, long and strong, covered with hairs and spines.
14. Argiope aemula Walckenaer, 1842	Foliage web weaver	**Argiope aemula** is a species of spider in the family Araneidae, found from India to the Philippines, in Sulawesi and in the New Hebrides. It is one of the species of giant conspicuous "signature spiders" of the genus Argiope, seen in tropical and subtropical grasslands. Signature spiders get their name from the zigzag design embossed on the web, the stabilimentum that is believed to serve a camouflage function. They show extreme sexual dimorphism and males are only 10% of the female in size and as a result become victims of sexual cannibalism. If the males survive the first copulation, then they almost always die during the second attempt.
Family-Hersilidae 15. Hersilias a vignyi Lucas, 1836	Foliage hunter	A hersiliid spider foundin Kerala, Maharashtra, Gujarat, WestBengal,Karnataka, Myanmar, Philippines, Singapore, and Sri Lanka. Popularly called the "two-tailed spider", this spider is common in southern India. It lives on the trunks of large trees — including commonly on the trunk of the coconut palm. Its colour closely matches that of the tree trunks in which it lives. It feeds on moths, ants, and other smaller spiders. Its cocoon is generally laid in the holes or crevices of trees.
Family-Lycosidae 16. Lycosa tarantula (wolf spdier)	Ground runner / hunter	**Lycosa tarantula** is the species originally known as the **tarantula**, a name that nowadays commonly refers to spiders in another family entirely, the Theraphosidae. It now may be better called the **tarantula wolf spider**, being in the wolf spider family, the Lycosidae. L. tarantula is a large species found in southern Europe, especially in the Apulia region of Italy and near the city of Taranto, from which it gets its name.



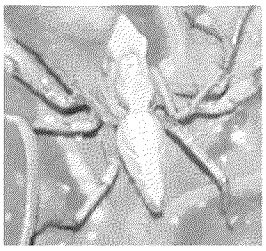
PP-1: *Crossopriza lyoni*



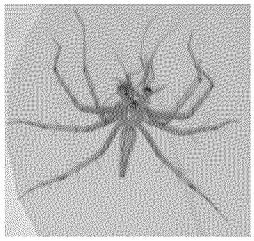
PP-2: *Pholcus phalangioides*



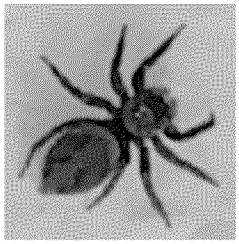
PP-3: *Thomisus projectus*



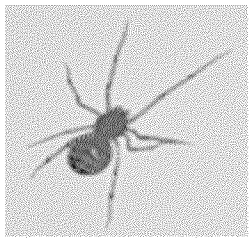
PP-4: *Oxypes pankaji*



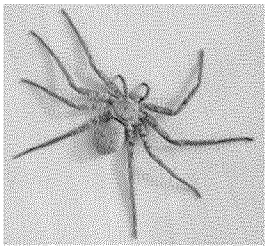
PP-5: *Oxypes chiurae*



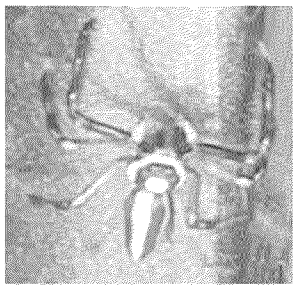
PP-6: *Plexippus paykulli*



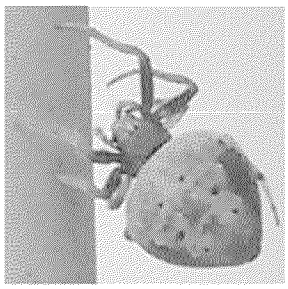
PP- 7: *Scytodes thoracica*



PP-8: *Heterropoda venatoria*

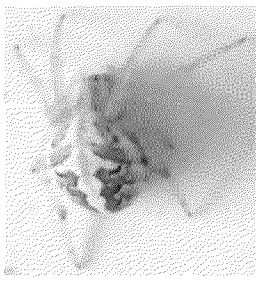


PP-9: *Taemonia dimidiate*

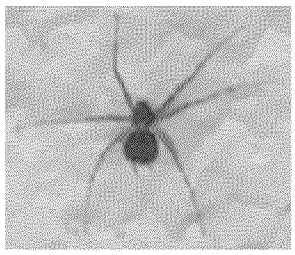


PP- 10: *Eriovixia excels*

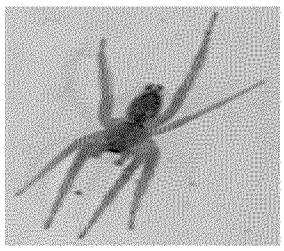
PP- 11: *Habrocestoides nitidus*



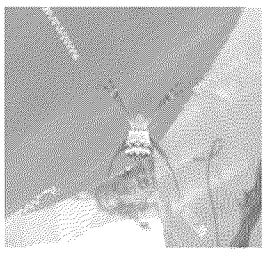
PP-12: *Neoscona theisi*



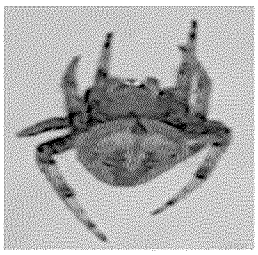
PP-13: *Hersiliasa vignyi*



PP-14: *Lycosa tarantula*



PP-15: *Argiopea acmula*



PP- 16: *Neoscona mukerjei.*