हमारा संदेश (OUR MESSAGE)

जागृति (Awareness),
मैत्री (Universal Brotherhood),
प्रगति (Progress)

मगध महिला महाविद्यालय
पटना विश्वविद्यालय

Vol. - II, 2014 - 2015

ISSN : 2279-9551

JIGYASA

The Journal of Educational Research and Innovation
A Peer Reviewed Journal of CPE Project for All Subjects

Magadh Mahila College
[Estd. : 1946]
NAAC Re-Accredited **'A'** Grade College
College with Potential for Excellence (CPE)
Status Accorded by UGC

Patna University, Patna
North Gandhi Maidan Patna - 800 001, Bihar, (India)

Tel : 0612-2219454
Email : info@magadhmahilacollege.org
Website. : www.magadhmahilacollege.org

About The College

Magadh Mahila College, a pioneer institution of higher education for young women in Bihar, was established in **1946 .A** constituent unit of Patna University, possessing a permanent affiliation under section **12B of UGC** Act since **1952 and r**eaccredited with **'A' grade** (3.02 CGPA) by **NAAC** in **January 2013, it is** imparting education to more than **4500** students in various disciplines. It has also been awarded **CPE** (College with Potential for Excellence) Status by the **UGC, New Delhi for 2011-2016, and has applied to retain the Status of CPE, for the year 2016-2021.**

The College has been honoured with **'Best College Award' on 'Shiksha Diwas 2014'** by Sri Nitish Kumar, the Chief Minister of Bihar and has also been awarded **'Excellent Institution of Higher Education for Girls in Bihar'** by His Excellency Sri Ram Nath Kovind, the Governor-cum Chancellor of Universities of Bihar, on the occasion of National Education Bihar Summit Award 2016.

A **multi-faculty institution** offering Bachelor (Honours) Degree Courses in Humanities, Social Sciences, Commerce, as well as Physical and Life Sciences, the college also offers Post Graduate Courses in **five** subjects. A large number of Professional Courses are also conducted under Self-financing Schemes.

Quality teaching, Computer education, facility for extracurricular activities including **Sports**, **Music**, **NSS, NCC, Science and IT Society, Students' Counselling Cell, Grievance Redressal Cell, Anti-Ragging Cell, Gender Knowledge Centre, Green Earth Brigade, Red Ribbon Club, Language Lab** and **Hostel** accommodation are inside the campus with modern facilities. **A Wi-Fi** campus, green and clean environment on the bank of the river Ganga add a remarkable aura to this institution, highly desirable for women education throughout Bihar and neighbouring states.

The students of Magadh Mahila College have excelled in **academics**, as well as in **sports** and **music** for the last seven decades. They have also brought accolades for the college with their extra ordinary performances in **Software Engineering and I.T Sectors**. The demand for its vocational courses is ever increasing. The college administration is sensitive to the needs of society and proposes to introduce new vocational courses in each academic session. Presently there are **five** hostels **(Gargi, Maitreyi, Awantika, Vaidehi** and **Welfare Hostel**) inside the campus. The **Welfare Hostel** constructed by the Department of Welfare, Govt. of Bihar is meant exclusively for the students of SC/ ST and weaker sections of the society.

The College **Central Library** is well equipped with more than one **lakh (1, 23, and 303)** books including e-books on various topics, computers with networking and internet connection. A huge collection of well recognized periodicals, journals, magazines and daily newspapers is also available in the library. The College has a very old **Alumnae Association**. College Alumnae Meet is organized in the college every year.

The concept of **inclusive growth** in the entire academic and extracurricular activities is given priority. Considering the growing demand for foreign languages in the job market, the college has started a short term **German Language Proficiency Course** done on two levels. Each level is of three months duration. Some more language courses are to be started very shortly.

Magadh Mahila College has striven not only to meet these ideals but also to enlighten its students with the help of its well-qualified and dedicated academic staff.

Vision And Mission

Magadh Mahila College is a premier institution of higher education for young women in Bihar and well known in the region for its value based education, quality teaching and discipline. This is the first girls' college in the state where teaching in science subjects started as early as 1947. Presently it is imparting education to more than 4500 students in 32 degree and diploma courses in the faculty of Arts, Humanities, Fine Arts, Social Sciences, Science, Commerce, Business Administration and Computer Applications at different levels.

The College Emblem comprising of three symbols conveys the message of Awareness, Brotherhood and Progress. The emblem represents the vision and mission of the esteemed women's institution. The holistic vision of college is committed to inculcate the pursuit of knowledge with preservation of our culture and traditional values leading to the empowerment of women and in particular, bringing about inclusive growth and qualitative changes in the society. The college directs its efforts to support the mission of Patna University and dedicates itself to promote an academic culture that provides opportunities to obtain the skill, knowledge and behaviour for empowering our students to be productive citizens. Our efforts focus to broaden their understanding of themselves and the world they live in, by developing strong communication and leadership skill, lifelong learning skill, profound social skill, appreciation for healthy environment and life style and commitment to the nation, society and humanity.

The mission of college is to empower girl students through knowledge and skills to enable them to cope and compete with the demands of modern age. Our mission is to provide and sustain a modern and respectful environment that ensures our students as well as the faculty members attain a high level of personal and academic achievement as determined by local, state, national and international standards.

In the light of Vision and Mission Statement our teachers and non-teaching staff take a keen interest in building the personality and career of students and work hard towards making the students realize the following objectives:

- To be a good citizen of the country
- Devotion to honesty integrity and loyalty
- Respect the rights of every individual
- To rise above caste ,creed and religious fundamentalism
- To be sensible to the needs of the weaker sections of the society
- To develop scientific awareness and scientific outlook
- To develop sportsmanship and have respect for healthy competition
- To pursue knowledge and apply it pragmatically
- To be sensitive towards preservation of environment ecology
- To be physically and emotionally strong to face the challenges of life
- To uphold the value of Indian culture and tradition and to sensitize about other cultures.

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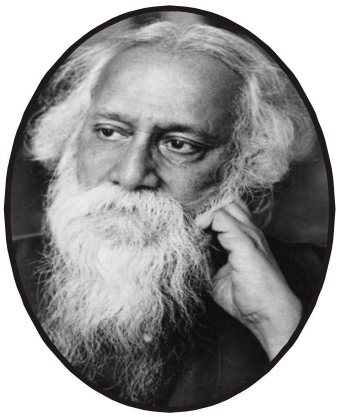

जहाँ दिमाग भय से मुक्त हो, सिर उन्नत हो,

जहाँ ज्ञान स्वतंत्र हो,

जहाँ देश को संकीर्णता एवं साम्प्रदायिकता ने

विभाजित नहीं किया हो,

जहाँ तर्क तथा विचार,

रूढ़िवादिता की रेगिस्तानी रेत में,

खो न गयी हो,

हे मेरे पिता,

उस स्वतंत्रता के स्वर्ग में,

मेरे देश को जगा !

— रविन्द्रनाथ ठाकुर

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CONTENTS

❖

From the Principal's Desk

It is a matter of pride and pleasure to me that 2015 edition of **'JIGYASA'** a Research Journal of Magadh Mahila College is being published. This journal is an outcome of continuous and sincere efforts of our students (UG, PG & Research Scholars). A sizeable number of our students undertake Short-Term Project on various point of interest related to current and relevant issues under the CPE scheme of the UGC.

After the presentation a report is prepared by a peer team of 2-3 students and their supervisors from various departments on the basis of primary data collected through empirical survey and lab - work of findings. The same is summarized and published through the said journal so that it is open to critics for their suggestions.

Indeed, the efforts of our students are commendable. Our effort to promote and inculcate research ability among the students is also fulfilled which is very helpful for their future career.

I wish this journal achieves a great height in its popularity and quality.

Asha Singh

Prof. (Dr.) Asha Singh
Principal, Magadh Mahila College
Patna University, Patna

From the Editors's Desk

'JIGYASA'- The Journal of Magadh Mahila College, Patna University, Patna is a peer reviewed academic journal on educational research and innovation to encourage and promote the research work among Undergraduate and Postgraduate students in all disciplines. The Journal contains original, peer-reviewed academic articles dealing with issues of state, national and international relevance in educational research, innovation, theory, methodology, and practice.

'**JIGYASA'** is an attempt to translate the classroom knowledge of students into life experiences. It's a bouquet of information that documents the research of students from various field like Arts Humanities, Fine Arts, Science, Social Sciences etc. under one banner and I am sure will act as an excellent reference point for other students to learn from.

Magadh Mahila College, the oldest pioneer institution of young women in Bihar was re-accredited by NAAC, with **'A'**Grade in January 2013 and the institution was also accorded the **'College with Potential for Excellence (CPE)** Status by UGC, New Delhi for 2011-2016. Under the CPE Project, the grant is sanctioned for improving the infrastructure and promoting the students of all departments towards research work. All Research Programmes are initiated and completed on the basis of CPE Scheme Guidelines.

JIGYAS will be innovative, providing a venue for scholarly works that report on the integration of teaching, learning, outreach programme, community engagement, and research. Students, Faculty Members and Research Scholars will be an integral part of the Journal, as they play a significant role in adding to the knowledge and information in this edition.

We are proud to bring out the CPE Research papers in Volume **II** of **JIGYASA** for the academic year 2014-2015, published by Magadh Mahila College, Patna University, Patna.

Shashi Sharma

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THE DEVELOPMENT OF ENGLISH LANGUAGE

Kumari Bhavya* Amrita Singh* Shweta* Archana Jaiswal*

ABSTRACT : *The growth and development of English Language is not a story of one night. It is a long journey of years and years. It is called an omnivorous language that has adopted and assimilated a number of foreign elements into it and at present has emerged as a global language. Present articles deals with the story of the growth and development of English language.*

KEY WORDS : Indo-European, Germanic, Phonetic changes, Teutonic, Orthography

INTRODUCTION

The English Language comes majorly from Germanic Language. In 499AD, Germanic people invaded British Isles. At that time, locals of Britain lived in small communities, away from each other. This made it easier for the Germanic tribes to defeat them. The English Language came to existence approximately in 450AD. It was made up of all the languages that the invaders brought. It was observed that when the society grew, language grew.

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HISTORY

During the 5th century, three Germanic Tribes invaded the British Isles. Namely, ANGLES, SAXONS and JUTES.Others were Vanats, Goths or Visigoths etc. Before the arrival of these invaders, England used Celtic language. Invaders pushed the Celtic speakers into Wales, Cornwall and Scotland.

THE MOVEMENT OF GERMANIC TRIBES

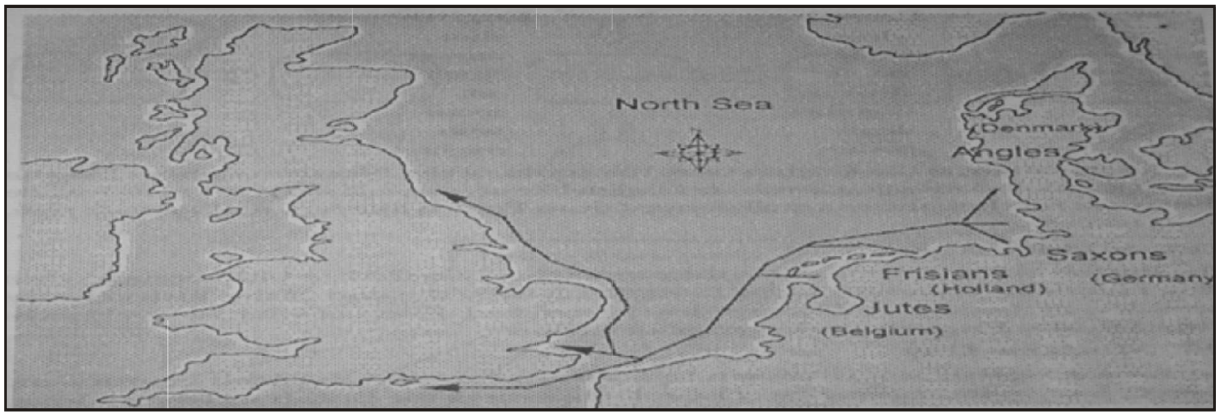
From DENMARK to NORTH GERMAN

⇨ Crossing the NORTH SEA

⇨ Reached ENGLAND

The main tribe Angles were named from **Engle**, their land of origin and their language was called **Englise** from which the word, **English** has been derived.

In 55BC, Julius Caesar discovered the British Isles and introduced **Latin** as King's tongue. **This map shows where the Saxons and Angles originated from.They started to settle from AD410:**



BEGINNING OF THE INDO-EUROPEAN (ARYAN) LANGUAGES AND THE RISE OF ENGLISH

- The English language has come from the Teutonic branch of the Indo-European languages, a big family of languages with almost all languages of Asia and Europe named Indo - European
- Indo-European languages can be classified into two sets of languages: Eastern and Western languages

INDO-EUROPEAN LANGUAGES

EASTERN GROUP

SANSKRIT
HILLTE
IRANIAN
BALTO-SLAVIC
ALBANIAN
TOCHARIAN
ARMENIAN

WESTERN GROUP

HELLENIC
ITALIC
CELTIC
GERMANIC

The English language belongs to the Teutonic group of languages and has descended from Germanic tongue.Like other Indo-European Languages, English was also inflected in the beginning and was thus a synthetic language.But with the passage of time, English started shedding its inflections and they became weaker and weaker. Towards the end of Old English period, English turned from being a synthetic language to an analytic language. Two tense systemswere developed. There were two numbers, the dual being dropped. During this time, there were practically no loan works. It had also developed processes to build new words:

- conversion
- derivation
- compounding

OLD ENGLISH PERIOD(AD450- AD1100)

Old English (also referred to as Anglo-Saxon or Englisc) is a West Germanic language, closely related to Old Frisian and was heavily influenced by Old Norse. Between the middle of 5th century and 12th century, Old English was spoken and written in parts of modern day England and southern Scotland.It was a passage from Synthetic to Analytical Stage

i) **Nouns :** In the Old English, Nouns had seven parts:

Nominative, Accusative, Instrumental, Dative, Ablative, Genitive and Locative.

Later, in the simplified version, only four of them were retained- the Nominative, Accusative, Dative and Genitive.

ii) **Verbs :** Drive- he drives- I drive- they drive, etc. So the word endings are non-existent in six cases, save a single one. But in the Old English it was as follows:

Eg: *ic-drif-e; /ŋ/u-drif-st; he/heo/hit-drif-Þ* [singular]

We/ge/hi-drif-a Þ [plural]

iii) **Personal Pronouns :** By this time, almost all inflexions had been dropped except 'him' and 'them'.

Eg: **1st person2nd person3rd person**

ic (I)-singular	*Þu(you)*	----------
wit (dual)	*git(dual)*	*he/heo/hit*
w?-plural-ge	----------	----------

iv) **Definite Articles :** The 'the' of today has no inflexions, can be used as singular, plural, article and adjective among others. But in Old English it was used in different forms with all genders and numbers.

Eg : Noun: *se(singular), se(plural) and a'et(neutral).*

v) **Orthography :** Around the 10th and 11th centuries, '*Þ*' and 'ð' were in use but in the later stages changed to 'th'.

Eg: *Þu>thou and 'ð' at>that*, having slight differentsounds.

vi) **SVO**: The rule says that the object must follow the verb, and if it does not do so, then it might get confused.

(Subject-»Verb-»Object)

vii) **Pronunciation:** In Old English, the 1st syllable was stressed in polysyllabic words, but this tradition has not be maintained in English.

viii) **Strong and Weak Verbs:** Strong Verbs got their past tense forms through inflexions, by changing a sound in the middle.

Eg: sing-sang-sung.

Weak Verbs got their past tense by adding suffixeslike -ed, -s, etc.

Eg: walk-walked-walked (past maker -ed

ix) **Gender:** The gender was determined by grammar, just as the Indo-European tradition and it took English a several hundred years to get rid of it.

Eg: *mayden(girl)-wi ∫ mann(woman)* were masculineas the words ended with a consonant.Similarly,sunne(son) was feminine as the word ends in avowel.

MAIN FEATURES OF OLD ENGLISH PERIOD

- Few loanwords
- Flexibility of the language

Landing of the ROMANS on the coast of KENT

GRIMM'S LAW

- Between the old English and the Middle English Period, some great changes took place in the English language; for over 700 years it was undergoing a change in phonology
- English slowly made its departure from its parent Teutonic language and was on its way towards being an analytical language
- Linguistics looked at the pronunciation of this time and marked these changes

JACOB GRIMM (1785-1863)

- In 1822, Jacob Grimm, a German Philologist did some research and formulated a law, known as Grimm's Law
- At a certain time in the Old English period, some sounds of English Language which had originated from Indo-European sources, seemed to disappear while some other had remained the same
- Searching a reason for this anomaly, he formulated a law which is a description of a linguistic phenomenon which took place in the development of a language
- The language goes from voiced sounds to voiceless sounds and then back to voiced sounds
- The first three sounds which went out of the English Language were /p/(labial), /t/ (dental) and /k/(velar)
- These sounds were very soon replaced by three new sounds, but interestingly, from the same place of articulation as the above three

STAGE I

(Early part of Old English, just after Germanic language had come in)

Latin	Old English	English
i) p > f(Labial)		
pisces	fire	fish
ii) t > Þ(θ) (Dental)		
tres	Þrec	three
tenuis	Þynne	thin
iii) k > h(Velar)		
cordis	heorte	heart
Quod	hwæt	what

The lost sounds slowly disappeared but returned after a few centuries.

PROTO- INDO- EUROPEAN LANGUAGE

	LABIAL	DENTAL	VEALAR	LABIAVELAR
ASPIRATED STOPS	*bh	*dh	*gh	*gwh
VOICED STOPS	*b	*d	*g	*gw
VOICELESS STOPS	*p	*t	*k	*kw

INDO- GERMANIC LANGUAGE

	LABIAL	DENTAL	VEALAR	LABIAVELAR
ASPIRATED STOPS	b	d	g	g/b
VOICED STOPS	p	t	k	k/qu
VOICELESS STOPS	f	p	h	Wh

VERNER'S LAW

- The transition of Indo-European to Germanic took place between the 2nd and 6th centuries B.C.
- It took 1800 years, in 1822 to dis cover what changes had taken place. And another 50 years later Verner's Law was proposed
- In 1875, Carl Verner found that there were certain cases where Grimm's Law was not followed, like in the case of medial consonants
- Whenever the accent is not on the vowel immediately preceding the consonant, then Grimm's Law does not apply to medial consonants

CARL VERNER (1846-1896)

E.g. centum → hundred

(The vowel does not carry the stress, so *t didn't change* to θ as accent is on the last syllable, so change in medial consonant.)

So *t* = *d*, but not θ, as accent in the last syllable.

According to some linguists, Verner's Law is more important than Grimm's Law as it refers back to accent pattern.

s > *r* : *OE* ceosan → choose(E). Thus, medial consonant /s/ becomes /r/, because accent on last syllable according to Verner. E.g. ceas ?› curon ?› coren.

The tradition is that in a word, the root syllable would be stressed, though this is not found in other languages of the family.

MIDDLE ENGLISH PERIOD(AD1100-AD1500)

Middle English is a term coined by historical linguistics to refer to various forms of the English language spoken:

- During the four hundred years of the Middle English period between the Norman conquest of (AD1066)
- When William Caxton developed the printing press
- When a form of London based English, Chaucery Standardpopul-arized

Middle English as a written language presented a wide variety of scribal and dialectal forms suggesting the decline of Wessex and the emergence of London as the major centre of literary production.

DIFFERENT LOANS AND BORROWINGS IN THE MIDDLE ENGLISH PERIOD

Latin Loan Words

Law: *client, conviction, legitimate*

Science : *dissolve, medicine, recipe*

Scandinavian loan words

Nouns : *sky, window, knife, sister, husband, fellow*

Verbs : *thrive, kill, hit, call*

French Loan Words

Government : *state, court, council, assembly, tax*

Religion : *theology, baptism, confession, prayer, crucifix*

Law : *judge, advocate, bill, petition, complaint, prison*

Fashion : *apparel, gown, robe, garment, coat, frock*

Army : *defense, soldier, enemy, combat, spy, captain*

Middle English Period was the period of levelled inflections.

EARLY MODERN ENGLISH (AD 1500 - AD 1600)

- The Early Modern English is important because it was used by Shakespeare and the first edition of King James' Bible
- This form of English is closest to the modern day language and can be easily understood by its modern day users
- The only difference lay in the areas of grammar, in the meanings of certain words and differences in spellings
- The Standardization of English spellings can be attributed to this phase
- This period is also known as the period of the Revival of Learning
- Constantinople was captured by the Turks, resulting in the spreading of scholars and learning all over Europe and heralded the onset of Renaissance

Thus, words like medium, genius, squalor, delirium came into English.

THE GREAT VOWEL SHIFT

- According to some linguists, the Great Vowel Shift is of greater importance than other linguistic changes of the period
- This covers a span of 200 years(14^{th} to 16^{th} century)
- It resulted in a huge variation in pronunciation betweenthe time of Chaucer and Shakespeare
- All the vowels of the time underwent a change:

i) The long vowel sounds are raised from low to high (short vowel not touched).

ii) When the high vowels cannot be raised, it is turned into a diphthong.

In ME there were—/i:/, /e:/, /ɛ:/, /a:/, /u:/, /o:/. In Present English(PE) there are only five.

STAGE I

High Front /i:/→/ai/ (Diphthongized)

E.g. Bite—/bi : t/—/bait/

Lyf—Chaucer /li : f/ ?Shakespeare /leif/ —PE /laif/

So this change is effected in all words with vowel /i/ in the centre and /e/ in the end. E.g. 'fine'.

High Back /u:/→/au/ (Diphthongized)

E.g. Mouse—/mu:s/ — /maus/

Chaucer /hu : s/ — Shakespeare /hous/ — PE / haus/.

Thus due to French influence, /u:/ sound changed to /ou/, for e.g. In town, mouse. This was because the/ou/ sound was used frequently in French.

STAGE II

Mid Front /e:/→/i:/ (Diphthongized)

E.g. meet — ME/me : t PE/mi : t/

Deed—ME /de : d/ ?PE /di : d/.

Thus this would cover all words with —ee in them.

Mid Back /o:/→/u:/

E.g. boot— ME/bo : t/ —PE/bu : t/

Shoe —ME/so:/?PE /su:/.

Moon—Chaucer /mo : n/—Shakespeare /mu : n/

—PE/mu : n/.

Exception, blood—/blo : d/ and not /blu : d/.

STAGE III

Mid Front /ɛ:/→/i:/ (Diphthongized)

E.g. meat— /mɛ : t/—/mi : t/

The sound /ɛ:/ is similar to bet, met, but is not used in English now.

Sea— /sɛ:/—/si:/.

Mid Back /∂:/→/o:/ or /∂u/ (Diphthongized)

E.g. stone— /st∂ : n/—/st∂ : n/ or /st∂un/.

STAGE IV :

Low Back Central /a:/→/e:/ or /ei/

E.g. Age— /eidz/

Abate— /∂bait/—/∂b∂it/.

This is applicable for all English sounds with —ate like late, take etc.

MODERN ENGLISH

- Modern English is a term that refers to the language spoken and written after the Great Vowel Shift of around A.D. 1650
- It has become a language which is more standardized in terms of grammar, spelling, word meanings, pronunciation and vocabulary
- It has completed its shift from being a synthetic language towards developing as an analytic language
- It is continuously growing at a steady pace every year with new words being added from all over the world

CONCLUSION

- Modern English is the dominant international language in human communication, science, business, aviation, international relation and even the internet
- It is now the most taught and most widely understood language of the world and thus, termed as the lingua franca of the world
- Approximately 350 billion people use English as their first language while second language speaker of Modern English is around 1.5 billion
- Modern English has a large number of dialects which are mutually intelligible. Some of these include British English, American English, Australian English, Canadian English, Caribbean English, Indian English, New Zealand English, South African English among others

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स्वातंत्र्योत्तर मैथिली कथा साहित्य मे नारी-विमर्श

('कथा किरण'क संदर्भ मे)

श्वेता कुमारी * अरुणा चौधरी *

सारांश : स्वातंत्र्योत्तर मैथिली कथा साहित्य मे नारी-विमर्शक अन्तर्गत जे कथा किरण संग्रहक चर्चा कयल गेल अछि, ताहि मे समाजक जर्जर व्यवस्थाक चित्रण भेल आछि। सम्पूर्ण कथा-संग्रह मे जे मानवीय मूल्यक अवलोकन भेल अछि से एहि सँ पहिने प्रकाशित किछुए कथा साहित्य मे देखवा मे अबैत अछि। सम्पूर्ण समाजक जर्जर व्यवस्था दिस बहुत कम साहित्यकारक ध्यान गेल। कथा-किरण मे 19 गोट कथा संकलित अछि। एहि संग्रह मे संकलित कथा सब अलग-अलग काल मे लिखल गेल, जे शिवशंकर श्रीनिवासक प्रयास सँ 1988 ई. मे भाषा प्रकाशन द्वारा प्रकाशित भेल।

शब्द कुंजी : मानवीय मूल्य, अवलोकन, जर्जर व्यवस्था, यथार्थबोधी, वृत्तचित्र

परिचय

मनुष्य संपूर्ण सृष्टिक परिचालक अछि। कोनो युग ओ समाजक स्थिति मनुष्यक बिना संभव नहि अछि। युगक संज्ञा मनुष्यक भौतिक तथा मानसिक भाव-विचार एवं दृष्टिक अनुसार निर्मित होइत अछि। युग सँ मनुष्यक बाह्य एवं अंतर भिन्नताक संयोग स्वयं भए जाइत अछि। समाजक भाव एवं अभाव, आदर्श ओ यथार्थ साहित्यिक रूपमे समान सौंदर्य ग्रहण कए नवीन अनुभूतिक संग जानल जाइत अछि। समाज मे विभिन्न प्रकारक होइत गतिविधि साहित्य नहि भए सकैत अछि, ओहिमे स्वच्छ ओ सुंदर स्थिति युग जीवनक सुंदर रूपक वर्णन साहित्य कहाओत आ विभिन्न साहित्यिक विधाक जन्म देत।

कथा साहित्य एहने एक अनुभूति ओ प्रेरणाक संगम सँ मनुष्यक समक्ष स्थापित अछि। युगक नैतिक, आथिक, आध्यात्मिक ओ मानसिकताक रूप-रेखाक आमूल चित्र, समाजक रूप, ग्रहण करैत अछि। कथामे युग, समाज, मानव एवं प्राकृतिक समन्वय प्रस्तुत रहैत अछि, जे प्रतिक्षण मनुष्यक कलांत भाव कँ शांति प्रदान करैत अछि। आजुक समय मे वर्त्तमान समस्या ऐतिहासिक तज्त्व समाचार पत्रमे घटित घटना आदिमे वास्तविकता ताकि कथा प्रस्तुत करबाक परंपरा रहल अछि। कथामे काल्पनिक अथवा वास्तविक अथवा उभय नि:सृत वा दृढ़ रूपरेखा रहैत अछि, जकर एक अपन सत्ता अछि, ओ स्वतंत्र होइत अछि आ वास्तविक रूपमे जीवंत रहब ओकर कर्तव्य होइत छैक। कथामे उत्तरदायित्व नहि होइत अछि, जे घटना घटित होइत अछि ओ घटना घटि क रहैत अछि। दोसर सँ ओकर कोनो संबंध नहि रखैत अछि। मात्र घटनाक वर्णन भाषाक उपक्रम द्वारा लिखल रहैत अछि। जाहि सँ नव बात सामने स्पष्ट होइत आओर ई एक नव विषय वस्तुक रूप मे नव मूल्य महत्त्व नव अर्थमे साहित्यिक माध्यम सँ स्पष्ट कएल रहैत अछि आओर ई कथाक रूप ग्रहण करैत अछि।

मैथिली साहित्यमे समग्र विधाक रचनाक आधार पर डॉ. ब्रजकिशोर वर्मा मणिपद्मकेँ पहिल सम्पूर्ण साहित्यकार मानल जाइत अछि। मुदा जौं जन्म क्रमांकक आधारपर निर्णए कएल जाए तँ कॉचीनाथ झा 'किरण' पहिल सम्पूर्ण साहित्यकार छथि। मणिपद्म जकाँ किरणजी सेहो

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साहित्यक समग्र विधा उपन्यास, वालकथा, एकांकी, नाटक, कविता संग्रह, महाकाव्य, निबंध संग्रह आ कथा संग्रहक रचना कएलनि। पराशर महाकाव्य लेल साहित्य अकादमी पुरस्कार आ 'कथा किरण' कथा संग्रहक लेल वैदेही सम्मानसँ सम्मानित कएल गेलनि।

शोध प्रविधि : विश्लेषणात्मक

विश्लेषण : 'कथा किरण' सम्बन्धत: अहि अन्तर्द्वन्द्वक सभसँ बेशी शिकार भेल। किएक तँ हिनक अहि संग्रहसँ पहिने प्रकाशित किछु रचनाकेँ छोड़ि समाजक विभिन्न ऊँच-नीच, सिनेह-द्वेष आ समन्वयवादकेँ स्पर्श करएबला कथा साहित्य मैथिलीमे नहि लिखल गेल छल। जौं किछु कथाकार अहि परिधिसँ ऊपर उठबाक प्रयासमे सफल भेलथि तँ मात्र किछुए कथामे। सम्पूर्ण समाजक जर्जर व्यवस्था दिस किनको नजरि पड़बो केलनि तँ कतहु। सम्पूर्ण कथा संग्रहमे मानवीय मूल्यक अवलोकन कथाकिरणसँ पहिने हरिमोहन झाक चर्चरी, मनमोहन झाक अश्रुकण, ललितक प्रतिनिधि, रामदेव झाक एक खीरा तीन फाँक, रमानन्द रेणुक कचोट, रमेश नारायणक पाथरक नाव, धूमकेतुक अगुरवान, शेफालिका वर्माक अर्थयुग आदिमे भेटैत अछि परंच अहि सभ कथा संग्रहक सभटा कथाकेँ अहि दृष्टिसँ सेहो प्रासंगिक नहि मानल जाए। प्रयोगवादी कथाकार राजकमल जीककिछु कथा जेना ललका पाग, साँझक गाछ, उपराजिता आदि मैथिली साहित्यमे अपन बेछप्प आधुनिक रूप नेने प्रवेश तँ कएलक मुदा हुनको किछु कथा मैथिली साहित्यकेँ शिल्प आ प्रयोगवादक विश्लेषणक क्रममे अन्हार घर नेने चलि गेल।

कथा किरणमे 19 गोट कथा संकलित अछि, अलग-अलग कालमे लिखल गेल अहि कथा सभकेँ शिवशंकर श्रीनिवासक प्रयाससँ 1988 ई मे भाषा प्रकाशन द्वारा प्रकाशित कएल गेल अछि। आमुख शिवशंकरजी लिखने छथि, जइमे एकटा चर्चित समीक्ष समीक्षक द्वारा आमुखसँ बेसी किरण जीक मनोदशा आ रचना प्रकाशन करएबाक क्रममे कथाकार पर श्री निवास जीक उपकार परिलक्षित भेल। वास्तवमे समीक्षा वा आमुख अहि रूपेँ नहि लिखबाक चाही। आमुखमे एकटा कमी आर देखएमे आएल जे श्रीनिवास लिखैत छथि- "किरण जीक प्रारंभिक कथा कथ्यक स्तरपर जतेक धारदार ओतेक सुन्दर शिल्प नहि।" मैथिली साहित्यक संग ई दुर्भाग्यपूर्ण विडंम्बना रहल जे मानसिक विलासिताकेँ स्पर्श करएबला कथाकारकेँ अइठाम शिल्पी मानल जाइत छन्हि। वास्तवमे कथाक दू गोट प्रमुख तत्वथिक- बिम्ब आ शिल्प। बिम्बक अर्थ कोनो घरक नेओं आ शिल्पक अर्थ ओकर चार, कोरो आ श्रृंगार- चून पालिश। जौं बिम्ब काल्पनिक तँ शिल्प कल्पनाशील अवश्य हएत। जखन कल्पने करबाक हएत तँ गामक खोपड़ीक कल्पना नहि कऽ कऽ आगराक ताजमहलक कल्पना कएल जाए। किरणजी मात्र यएह अपराध कएने छथि जे आगराक ताज महलकेँ छोड़ि मिथिलाक गामक मचानपर अपन रचनोमे जीवंत रहलाह, तँए 'शिल्पी' नहि छथि। साहिघ्त्घ्य्कार कल्पनाशील होइत छैक, मुदा जौं कखनो मोनकेँ ध रातलपर आनि कऽ लिखैत अछि तँ यथार्थवोधक बिम्ब समाजक सत्यकेँ वृतिचित्रक रूपमे देखैत अछि। किरणजी संभवत: वएह श्रेणीक ययार्थवोधी कथाकार छथि।

पहिलुक कथा 'करूणा' करूणाक नैहरमे स्वच्छन्द जीवनसँ प्रारंभ होइत ओइठाम तक पहुँच जाइत अछि जतए धरि साधारण शिल्पी नहि पहुँच सकैत छथि। यामिनीकान्त बाबूक सुकन्या करूणाक विवाह सुन्दरबाबू सँ भेल। नैहरक भगजोगिनी कर्त्तव्य पथपर भाटक संग सासुरमे आगाँ बढ़ैत छलि, वृद्ध पितामही सासु आ मातृ पितृ विहीन जाउत नरेन्द्रक संग....। तीन मासक भीतर अजिया सासुक देहावसान आ ओकर दू मास बाद श्वसन ज्वरसँ पतिघ्क देहान्तक पश्चात करूणा टूटि गेलीह। प्राचीन आर्य संस्कृति जकरा जनभाषामे सनातन कहल जाइछ, रूढ़िवादिताक आवरणसँ अखन धरि ओझराएल अछि। जे लोक समाजक मुख्य धारासँ कात लागल छथि, ओ अहि कथा कथित सनातन संस्कृतिक आधारपर संस्कार तँ करैत छथि, मुदा ओइमे ओझराएल नहि। अहि दृष्टिसँ समाजक पछातिक लोककेँ बेसी विचारवान मानल जाए। अगिला लोकमे बाहरी आडंवरकेँ मनवाक क्रममे किछु कुव्यवस्था उत्पन्न भऽ गेल। संभवत: ई कथा सनातनधर्मी ब्राह्मण परिवारकेँ धियानमे राखि कऽ लिखल गेल। भऽ सकैछ कथाकारक ई कल्पना हुअनि, मुदा अहि प्रकारक घटना वास्तवमे एखन धरि होइत अछि जे सवर्ण परिवारक वाल विधवा सुकन्याकेँ सेहो पुनर्विवाह करबाक समाजमे मान्यता नहि गेल, जइ समैमे ई कथा लिखल गेल ओइ समैमे स्थिति तँ आर दयनीय छल।

'करूणा' कथा विषम परिस्थितिमे आगाँ बढ़ैत अछि। एकटा वालिका नरेन्द्रकेँ तकैत करूणा घर पहुँचलि। नरेन्द्र अपन मातृकमे छल। करूणा एकसरि छली। वालिका चकित होइत प्रश्न कएलनि, 'एकसरि डऽर नहि लगैत अछि। अपन जीवनकेँ जीवन्त लहासक रूपमे करूणा वाजलि- ककर डऽर वास्तवमे भूत-परेत एकटा भावनात्मक रूपसँ शून्य प्रणीक लेल डरक साधन नहि बनि सकैछ। की छन्हि जे चोर आओत? मुदा बालिका प्रश्न कएल जे जौं अपने उठा लिए? अहि प्रकारक प्रश्नसँ करूणा स्तब्ध भऽ गेली। एकटा नारीक मर्यादा समाजक दृष्टिमे जे महत्व राखए, मुदा ओकरा लेल सर्वोपरि। समाजक उदाहरण यएह लेल जे अहि समाजक नीच लोकसँ लऽ कऽ विचारवान वर्गक किछु लोक सेहो अवलाक चरित्र हननसँ वाज नहि आएल अछि। करूणा भविष्यक डरसँ काँपि अपन सुन्नर रूपकेँ भयावह बनएबाक लेल उद्धत भऽ गेली। परिस्थिति सेहो संग देलकनि जे बच्चाबाबूक माथ परक चाम उज्जर देख करण पुछलनि तँ पता चललनि जे सल्फ्यूरिक एसिड अर्थात् तेजाप प्रयोगशालामे पड़ि गेल।

बच्चाबाबूकेँ अपन घरसँ विदा करैत देरी तखापर राखल सल्फ्यूरिक एसिड अपन मुँहपर ठाढ़ि करूणा रूपवतीसँ जीविघ्त पिचाशक रूपमे आबि गेलीह?

आब प्रश्न उठैत अछि जे करूणाकेँ एना कएलासँ की भेटल? भेटबाक प्रश्न तँ नहि मुदा हुनक चरित्रहरणक आशंका हुनका मोने समाप्त भऽ गेल। जौं एकटा मातृ-पितृ विहीन बालकक दायित्व नहि रहतनि तँ आत्महत्या सेहो कऽ सकैत छलीह। यएह थिक देवी भक्तिक केन्द्र मिथिलामे देवीक दशा। नारीविमर्शक एकरूपक यथार्थचित्रण किरणजी कएलनि। कनेक कमी जे कथाक प्रारम्भ सरल शब्दमे सेहो कएल जा सकैत छल मुदा साहित्यक पुरा रूपक शब्दमे कथाकेँ प्रवेश करा कऽ किरणजी ओइ विचारवान समीक्षकक दृष्टिमे अपन स्थान बनएलनि जनिक मान्यता छन्हि जे भाषा उच्च कोटिक हुअए, जकर अर्थ सभ मैथिल नहि लगा सकथि ओ वास्तविक रचना थिक। भऽ सकैत अछि जे कथाकार अहि प्रकारक शब्द सभसँ कथाक सहज रूपेँ कएने होथि, वा मूलतः कवि रहनिहार किरण अपन काव्यात्मक प्रवृतिकेँ नै झाँपि कविताक बिम्बकेँ कथाक रूप दऽ देने होथि। जौं ई कथा काव्य रहितए तँ मैथिली साहित्यक लेल विस्मयकारी क्षण होइतए जखन करूणा.... महाकाव्यक नायिका बनि मिथिलाक मानस पटलपर विचरण करितथि। दोसर जे कनेक नकारात्मक विन्दु भेटल ओ अछि करूणाक अपन आभा नष्ट करबाक दृष्टिकोण। यथार्थबोधी कथाकारकेँ अइठाम क्रांतिवादी दृष्टिकोण स्पष्ट करबाक चाहियनि, मुदा किरणजी सन सिद्धहस्त रचनाकारक सोच सेहो समाजमे क्रांति नहि सोचि सकल।

हम सम मिथिलामे रहैत छी, एकटा उतर आधुनिक सोच की कहल जाए आधुनिक दृष्टिकोणसँ दूर मिथिला .... जइठाम एखनो विधवाकेँ पुनर्विवाह की कहल जाए कोनो आन कन्याक विवाह संस्कारक ऐहब नहि बनाओल जाइत अछि। फ्रांसक राज्यक्रांति हुअए वा यूरोपक धर्म सुधार आन्दोलन सभमे साहित्यक अपन महत्व अछि, मुदा ई आर्यावर्त्त थिक अइठाम साहित्य मनोरंजन मात्रक साधन मानल जाइत अछि, प्रेरणाक स्रोत नहि। वास्तविकता सेहो छैक जे साहित्यकारकेँ अपन लेखनीक दृष्टिकोणकेँ अपन जीवनमे सेहो जोड़ि देवाक चाही, नहि तँ समाज मान्यता कोना देतनि वा ओ साहित्य प्रेरक कोना हएत? किरणजी करूणा सन दृष्टिकोण रखैत हेताह किएक तँ हुनको जन्म अही समाजमे तँए क्रांतिवादी नहि बनि 'करूणा'क नाश देखा देलनि। ओइ प्रकारक नाश जे जइसँ नीक मृत्यु। मुदा सम्यक सोचबला किरणजी केँ अइठाम कनेक क्रांतिवादी बनि करूणाक पुनर्विवाह देखएबाक चाहियनि। यथर्थादोषी साहित्यकारकेँ सेहो समाजमे विचार उत्पन्न करएबाक लेल क्रांतिवादी बनब साहित्यक लेल अनिवार्य नहि तँ आडंवरकेँ समर्थन करएबला अहि प्रकारक साहित्यकेँ पढ़निहार लोक दोष साहित्यकारेपर देत।

दोसर कथा 'एहि चारि खूनक खोज केनिहार के?' अर्थनीतिकेँ धियानमे राखि कऽ लिखल गेल। कथाक प्रारंभमे कथाकार ब्राह्मणवादी व्यवस्थापर कनेक कटाक्ष कएलनि, 'पंडित जे कहथि से करी मुदा जे करथि से नहि करी' अर्थात् अग्रसोची समाजक धर्मपालक जातिक कर्म आ कथनमे भिन्नता अछि। वास्तविकता सेहो अछि पंडित विद्याध्ययन आ नीति अध्ययनक आधारपर उचित वचन तँ अपन मुखसँ वजैत छथि, मुदा मात्र होसराक लेल अपन लेल नहि।

अहि कथामे सेहो एकटा सत्कर्मी परेमा अपन स्वाभिमानक संग जीवन तँ प्रारंभ कएलक मुदा सम्पतियासँ विवाहक वाद साधनहीन परेमाक स्वाभिमान परिस्थितिवश डगमगा गेल। अपन नेनाकेँ जीवित रखबाक लेल हलुआइक दोकानमे किछु भोजन सामग्री तकैत पकड़ल गेल। पुलिस अपन काज कएलक एकटा भोजन चोरि करबाक प्रयास करैबला चोरकेँ डकैत बना कऽ सातवर्ष कठोर कारावास दिआ देलक। न्यायालयमे परेमाकेँ न्याय नहि भेटल किएक तँ ओकर गप्प सुनत के?

परेमा जहलसँ छूटल तँ अर्थहीन परिवारक सभ जन समाप्त.....।

अर्थनीतिक ई कथा समाजक अंतिम व्यक्तिपर प्रारंभ भऽ ओकर अंतसँ समाप्त भेल। किरण जीक ई कथा यथार्थबोधी मानल जा सकैत अछि। अइमे क्रांतिक कोनो गुंजाइश नहि किएक तँ शिक्षा आ भौतिक साधनसँ विहीन मानब सरकारी तंत्रक विरूद्धमे कोना आन्दोलन करए, वादमे परेमा कतए जाए किएक तँ ओ विक्षिप्त भऽ गेल।

'काल ककरो छोड़त' एकटा राजपरिवारक कथा थिक। महाराज दीर्घवाहु अपन मृत्युकालमे अपन राज्य आ अपन पाँच वर्षक वालक सुन्दर अपन छोट भाए वीरवाहुकेँ सौंपि अहि संसारसँ विदा भेलनि। कालान्तरमे वीरवाहु अपने वास्तविक राजा कहएबाक लेल अपन भातिजकेँ मारि देलनि। ई दृश्य वीरवाहुक पुत्र शंकर देखलक आ पितृहन्ता बनि गेल। शंकरक स्त्री राधा दोसर पड़ोसी युवक रमेशसँ प्रेम करैत छलि, ओ सेहो 'महाजनोयेन गतः स पंथा'क आधारपर शंकरक हत्या कऽ देलथिन। अंतमे कथाकार ई प्रश्न छोड़ि कथाक इतिश्री कएलनि- 'काल की राधाकेँ छोड़तनि? वास्तवमे एकरा कथा नहि मानल जाए ई थिक कथाकारक विराट जीवन दर्शन ओ शैक्षणिक योग्यताक एकटा चित्र। इतिहास साक्षी अछि धनलोलुपता ओ राजपदक आशमे कतेक शासक संबंधक मर्यादाकेँविसरि गेल छलथि। लोभ पापक कारण होइछ। लोभ माली अपन फूलवारीक फूलसँ सेहो करैत अछि, एकटा पति अपन पत्नीक सौन्दर्यसँ सेहो करैत अछि मुदा ओथिक मर्यादापूर्ण अधिकारक लोभ। अमर्यादित ओ अवांछित लोभक परिस्थितिमे लोक अपने नाश करैत अछि। प्रलाप, समाजक चित्र, धर्मरत्नाकर, चनटा, जाति पाँतिक जाड़ू आदि कथा सेहो समाजक अग्रआसनपर बैसल लोकक समाजक अंतिम व्यक्तक प्रति दृष्टिकोणकेँ स्पष्ट करबैत अछि। अहि प्रकारक कथा जइमे सम्पूर्ण समाजक स्थितिक चर्च हुअए ललित आ जगदीश प्रसाद मंडलकेँ छोड़ि किरण जकाँ केओ नहि कएलक। मुदा सभटा कथा यथार्थचित्रण तँए श्रीनिवासजी हिनका शिल्पीक संज्ञा दइमे संकोच कएलनि। वास्तविकता अर्थात् इजोतसँ डर कल्पना अर्थात अन्हारसँ प्रेम मैथिली साहित्यक प्रवृति रहल छैक तँए किरणकेँ ओ स्थान नहि भेटल जकर ओ अधिकारी छथि। अहि संग्रहक सभसँ विलक्षण कथा थिक- मधुरमनि। अपन साहित्यककिछु चर्चित कथामे एकर स्थान अछि। एकटा निम्नवर्गीय समाजक मुँहजोरि मुदा स्वस्थ आ कर्मशील नारी मधुरमनि अपन शरीरसँ असमर्थ पतिक प्रतिदायित्व रखैत अछि। मधुरमनिक कठोरवाणीसँ उद्विग्न भऽ ओकर पति मोचन घरसँ पड़ा गेल। मधुरमनि पोटि कऽ फेर ओकरा घरमे आनि लेलक। सतना माय जखन मोचनक आलोचना मधुरमनि लग करैत अछि तँ मधुरमनि सतना मायपर तीक्ष्ण शब्दवाण चला कऽ ओकरा चुप करा दैत अछि। 'पिट्ठा पहलमान लऽ कऽ हम की करब जे भरि दिन डेङविते रहत।' वास्तवमे सतना मायक शरीरसँ मजगूत पति खूब पिटाइ करैत छल। यएह थिक हमरा सबहक समाजक नारीक पतिक प्रति सिनेह ओ अपन पतिकेँ किछु कहि सकैत छथि, मुदा दोसर किए कहत? अइमे अधिकार आ सिनेह दुनू भेटैत अछि।

अहि प्रकारे विहनि कथाक अहि संग्रहकेँ युगान्तकारी तँ नहि मानल जा सकैत अछि मुदा समाजक वास्तविक दशाक विवेचन आ तर्कपूर्ण शैलीसँ ई संग्रह अपन अलग स्थान रखैत अछि।

संदर्भ

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मिर्जा गालिब अहद और शायरी

Kahkasha Perween * Sajda Tabassum * Shabnam Perween * Suraj Dev Singh *

مرزا غالب: عہد اور شاعری

مرزا غالب کا اصل نام مرزا اسداللہ بیگ خاں عرفیت مرزا نوشہ اور مغل دربار کی طرف سے ''نجم الدولہ دبیرالملک اسداللہ خان بہادر نظام جنگ'' کا خطاب ملا تھا۔ ان کے والد کا نام مرزا عبداللہ بیگ تھا جن کی شادی آگرہ میں مرزا غلام حسین خاں کی بیٹی عزت النسا بیگم سے ہوئی تھی۔ انھیں کے بطن سے مرزا غالب ۲۷/ دسمبر ۱۷۹۷ء کو آگرہ میں پیدا ہوئے۔

مرزا غالب بچپن ہی میں یتیم ہو گئے تھے اس لئے ان کی پرورش ان کے چچا جان مرزا نصراللہ بیگ خاں نے کی۔ مرزا غالب پوری طرح ہوش بھی نہ سنھال پائے تھے کہ محض ۸ سال کی چھوٹی عمر میں ان کے سر سے چچا جان کا بھی سایہ اٹھ گیا۔ مرزا غالب کی ابتدائی تعلیم آگرہ کے مشہور عالم مولوی محمد معظم صاحب کے زیر نگرانی میں ہوئی۔ مرزا غالب بچپن سے ہی ذہین تھے اس لئے شاعری کی ابتدا بچپن ہی سے ہوگئی تھی۔ چنانچہ اپنی ایک فارسی غزل اپنے استاد مولوی معظم کی خدمت میں بغرض اصلاح اس وقت پیش کی جبکہ ان کی عمر محض ۱۰ سال کی تھی ۱۸۱۰ء میں جب مرزا غالب کی عمر ۱۳ سال کی ہوئی تو ان کی شادی نواب احمد بخش خاں کے چھوٹے بھائی نواب الٰہی بخش خاں معروف کی بیٹی امراؤ بیگم سے ہوگئی اور ۱۸۱۲ء میں انھوں نے اپنے آبائی وطن آگرہ کو خیر باد کہہ کر دہلی میں سکونت اختیار کر لی۔

مرزا غالب کے دہلی آنے پر ان کی زندگی میں ایک انقلاب رونما ہو گیا۔ یہاں پر ان کی راہ و رسم ایسے علم دوست حضرات سے ہوئی جن کی ذات سے انھیں علمی و اخلاقی فوائد حاصل ہوئے۔ ابتدائی زندگی سے ہی مرزا غالب انتہائی مالی مشکلات میں گرفتار ہو چکے تھے۔ اس لئے دوستوں کے مشورے سے قلعے کی ملازمت کرنے کو فوراً راضی ہو گئے۔

جولائی ۱۸۵۰ء میں حکیم احسن اللہ خاں مدار المہام اور مولانا نصیر الدین عرف میاں کالے صاحب کی سفارش پر اور مغل بادشاہ بہادر شاہ ظفر کی فرمائش پر تیموری خاندان کی تاریخ جس کا نام 'مہر نیم روز' ہے، لکھنے کے لئے رکھے گئے اور انھیں ''نجم الدولہ دبیر الملک اسداللہ خان بہادر نظام جنگ'' کا خطاب عطا کیا گیا۔ خاندانِ تیموری کی تاریخ لکھنے کے عوض ۶۰۰ روپیہ سالانہ وظیفہ دینے کا طے ہوا۔ اس کی وضاحت 'دستنبو' میں بعنوانِ 'جنگ عرب و ایران اور پہلی جنگِ آزادی کا مقابلہ' میں ان لفظوں میں کیا گیا ہے:-

> ''سات آٹھ سال ہوئے کہ بادشاہ دہلی نے مجھے بلایا اور مجھ سے فرمائش کی کہ میں تیموری خاندان کے بادشاہوں کی تاریخ لکھوں جس کے عوض ۶۰۰ روپیہ سالانہ وظیفہ دیا جائے گا۔ میں نے اس خدمت کو قبول کر لیا اور کام میں مشغول ہو گیا۔''

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مرزا غالبؔ تیموری خاندان کے بادشاہوں کی تاریخ لکھنے کی ذمہ داری تو ضرور قبول کر لی لیکن اس کے عوض ملنے والے سالانہ وظیفے کو لے کر ان کی پریشانی بڑھ گئی تھی۔ اس کی وجہ یہ تھی کہ وظیفے کی رقم ۶۰۰ سالانہ یعنی پچاس روپے ماہوار طے پایا تھا۔ لیکن اس زمانے میں قلعے کا جو دستور تھا اس کے مطابق ہر چھ مہینے پر قلعے میں چٹھا بٹتا تھا اور چھ مہینے کی رقم ایک ساتھ ملتی تھی۔ اس دوران غالبؔ اپنا کام کیسے چلاتے ہوں گے اس کا اندازہ آسانی سے لگایا جا سکتا ہے۔ ظاہر ہے وہ قرض لے کر اپنا کام اور روزمرہ کے اخراجات چلاتے ہوں گے۔ یہ دستور اس زمانے میں بھی تھا اور آج بھی ہندوستان کے کئی گاؤں میں یہ دستور زندہ و باقی ہے۔ اس سلسلے میں ایک شعر ملاحظہ ہو:۔

قرض کی پیتے تھے مے، لیکن سمجھتے تھے کہ ہاں، رنگ لاوے گی ہماری فاقہ مستی ایک دن۔

مرزا غالب کی زندگی کے اہم حصوں میں ۱۸۵۷ء کی پہلی جنگِ آزادی کی لڑائی بے حد اہم ہے۔ اس ہنگامہ خیز حادثہ نے دہلی والوں کے ساتھ ساتھ مرزا غالب کو بھی حد درجہ متاثر کیا۔ انگریزوں نے ملک میں قتل و غارت گری کا ایسا ماحول برپا کیا جس میں دہلی والوں کے ساتھ ہی ساتھ مرزا غالب بھی اس کے جد میں آ گئے اور ۱۸/ستمبر کو انگریزوں نے ان کے مکان کا سامان بھی لوٹ لیا۔ علاوہ ازیں ان کے چھوٹے بھائی مرزا یوسف کی ۱۸ اکتوبر کو انتقال نے مرزا غالب کو توڑ کر رکھ دیا۔ باوجود اس کے ان کے قدم لڑکھڑائے نہیں اور اسی غمناک ماحول میں رام پور کے نواب کی دعوت پر جنوری ۱۸۶۰ء میں رام پور کے سفر پر روانہ ہوئے اور یہاں سے نواب صاحب کی کوشش پر پینشن کا اجرا ہوا۔

۱۸۶۶ء میں مرزا غالب کے آخری عمر کا نقشہ کچھ بہتر نہیں تھا۔ صحت روز بہ روز خراب رہنے لگی۔ مولانا الطاف حسین حالی لکھتے ہیں:۔

''اکثر اوقات پلنگ پر پڑے رہتے تھے غصا بھی کچھ نہیں رہی تھی۔''

مرزا غالب کی زندگی گزارنے کے طور طریقے عام لوگوں سے بالکل مختلف تھی۔ جوانی کی بے اعتدالیوں اور شراب نوشی نے ان کی صحت کو روز بہ روز تباہ و برباد کر رہی تھی۔ ان کے زندگی کی آخری لمحوں کا جائزہ لیتے ہوئے خواجہ عزیز یوں رقم طراز ہیں:۔

''مرنے سے چند روز پیشتر بے ہوشی طاری ہو گئی تھی۔ وفات سے ایک دن پہلے دماغ پر فالج گرا اور اسی بے ہوشی کی حالت میں ۱۵/فروری ۱۸۶۹ء کو ان کی روح پرواز کر گئی۔''

مرزا غالبؔ نے کئی اسباب سے جن میں سے ایک پنشن کے سلسلے میں مقدمہ بازی کے سبب لکھنؤ، بنارس اور کلکتہ کا سفر کیا اور وہاں کے ادبی مباحثوں میں نہ صرف یہ کہ حصّہ لیا بلکہ اُس تغیّر پذیر نئی زندگی کا بغور تجربہ اور مشاہدہ بھی

کیا جو بنگال پر ایسٹ انڈیا کمپنی کے اقتدار حاصل کر لینے کی وجہ سے پیدا ہو رہی تھی۔ اُس وقت کے سارے شعراء میں محض غالبؔ ہی ایسے تھے جو زندگی کے اس نئے دھارے سے آشنا تھے جس کا اثر اُن کے خیالات اور شاعری میں واضح طور پر دیکھا جا سکتا ہے۔ بغیر کسی تمہید اور لاگ لپیٹ کے سب سے پہلے غالبؔ کے درجِ ذیل شعر پر غور کیا جائے۔

اُگ رہا ہے درو دیوار پر سبزہ غالبؔ، ہم بیاباں میں ہیں اور گھر میں بہار آئی ہے۔

یوں تو غالبؔ کے اشعار کی کی تشریح مختلف ناقدین نے مختلف طریقے سے کی ہے اور شعر کے حسن و قبح کو اُجاگر کرنے کے ساتھ ہی ساتھ اس کے مختلف پہلوؤں کو بھی پیش کرنے کی بھرپور کوشش کی ہے۔ اس ضمن میں پروفیسر یوسف سلیم چشتی شعر کی تشریح کرتے ہوئے رقم طراز ہیں:-

''جوشِ وحشت میں غالب گھر سے نکل کر بیاباں میں چلے گئے۔ ان کی غیر موجودگی میں گھر ویران ہو گیا اور ہر طرف سبزہ نمودار ہو گیا۔ اس سبزے کو انھوں نے طنزاً بہار سے تعبیر کیا ہے۔ چنانچہ کہتے ہیں کہ بدقسمتی تو دیکھو ہم بیاباں میں ہیں اور گھر میں بہار آئی ہے۔ شعر کی ساری دلکشی اسی طنز میں پوشیدہ ہے۔ ویرانی کو بہار سے تعبیر کرنا بلاشبہہ غالب کی جدّتِ فکر کی بڑی دلکش مثال ہے۔''

لیکن اگر اس شعر پر غور کریں تو اس شعر میں شاعر اپنے دور کی اُس ستم ظریف، ناگہاں اور دل دوز واقعہ کا تذکرہ کرتا نظر آتا ہے جو انگریزوں کے خلاف ہندوستانیوں کی پہلی جنگِ آزادی اور انگریز کی زبان میں 'غدر' کا اعلان کیا گیا تھا اور اس کے نتیجے میں مسلم کشی کا واقعہ رونما ہوا۔

پہلی جنگِ آزادی کو کچلنے اور اس میں شرکت کرنے والے جنگ کے متوالوں کا حوصلہ توڑنے کی غرض سے انگریزوں نے دہلی کی سڑکوں کو انسانی لاشوں اور گلی کوچوں کو خون سے رنگ دیا تھا۔ ان کے نشانے کی ذد میں سب سے پہلے دہلی کے مسلمان آئے۔ ان کے گھروں کے سارے ساز و سامان یا تو لوٹ لئے گئے یا ان کے گھروں کو نذرِ آتش کر دیا گیا۔ جو لوگ اپنی جان بچانے میں کامیاب ہوئے وہ جنگلوں اور ویرانوں میں چلے گئے۔ ان کے گھر بغیر رکھ رکھاؤ کے سنسان اور ویران پڑے ہوئے تھے اور اس کی دیکھ بھال نہ ہونے کے سبب اس کے درو دیواروں پر سبزے اُگنے شروع ہو گئے تھے۔ مذکورہ بالا شعر میں غالبؔ واضح طور پر انھیں حالات کی طرف اشارہ کرتے دکھائی دیتے ہیں۔ ظاہر ہے سبزہ سبزہ ہونا، سبزہ زار ہونا اور سبزے کا اُگنا وغیرہ شادابی، ہریالی اور خوشحالی کی علامت ہے لیکن یہاں پر صورت حال کچھ اور ہی ہے۔ اسی سے ملتے جلتے دوسرے شعر پر غور کیا جائے:-

سبزہ زار ہر درو دیوارِ غمکدہ، جس کی بہار یہ ہو، پھر اس کی خزاں نہ پوچھ۔

واضح رہے کہ جب کوئی مکان مدّتوں غیر آباد اور منہدم پڑا رہتا ہے تو بارشوں سے اس میں سبزہ اُگ آتا ہے۔ کہتے ہیں میرے غمکدہ میں میری گریہ وزاری کی برسات سے ہر طرف سبزہ اُگ آیا ہے۔ گویا میرا غمکدہ سبزہ زار بن گیا ہے اور اس میں بہار آئی ہے۔ گھر میں سبزہ اُگنا ویرانی کی نشانی ہے۔ جس گھر کی بہار یہ ہے کہ وہ بالکل ہی ویران ہو گیا ہے بلکہ خزاں سے بھی بدتر ہے۔ اس کی خزاں کی بابت نہ پوچھو کہ کس قسم کی ہوگی۔ بالکل اسی نوح کی ایک اور شعر پر نظر ڈالیں:-

اُگا ہے گھر میں ہر سو سبزہ ویرانی تماشا کر،
مدار اب کھودنے پر گھاس کے ہے میرے درباں کا۔

لیکن یہاں پر در و دیوار پر سبزے کا اُگنا شادابی، ہریالی اور خوشحالی کی علامت نہیں بلکہ تباہی و بربادی، لوٹ مار، قتل و غارت گری اور خوں ریزی کی نشاندہی کرتی ہے۔ اس ضمن میں پروفیسر گوپی چند نارنگ اپنی کتاب 'ہندوستان کی تحریکِ آزادی اور اردو شاعری' کے صفحہ ۲۹۵ پر لکھتے ہیں:-

''پہلی جنگِ آزادی' کے بعد دہلی والوں اور خاص طور پر مسلمانوں پر مصائب اور آلام کے ایسے ایسے پہاڑ ٹوٹے کہ ان کے ذکر سے آج بھی آنکھیں آشوب کرآتی ہیں۔ غالبؔ نے یہ سب کچھ اپنی آنکھوں سے دیکھا تھا۔ اس مظلومیت اور بے بسی کا احساس ایک جگہ ان کے قطع میں ظاہر ہوا ہے۔''

'پہلی جنگِ آزادی' کے بعد دہلی کی جو حالت خصوصی طور پر مسلمانوں کی تباہی و بربادی کی جو حالت تھی اُس کی عکاسی اس شعر میں واضح طور پر ہوتی ہے۔ ظاہر ہے اُن کی فارسی ڈائری 'دستنبو' اُنھیں واقعات کی عکاسی کرتا ہے۔ اس میں وہ 'جنوری ۱۸۵۸ء' کے عنوان سے لکھتے ہیں:-

''جنوری ۱۸۵۸ء کے آغاز میں ہندوؤں کو فرمانِ آزادی مل گیا۔ اور (شہر میں) آباد ہونے کی اجازت دے دی گئی۔ یہ لوگ (ہندو) جہاں جہاں تھے۔ شہر کی طرف چل پڑے۔ خانماں برباد مسلمانوں کے گھروں میں (خالی پڑے رہنے کے سبب سے) سبزہ اس قدر اُگ آیا ہے کہ در و دیوار سبز ہیں۔ ہر لحہ سبزہ ءسرِ دیوار کی زبان سے یہ صدا آتی ہے کہ مسلمانوں کی جگہ (بہ دستور) خالی ہے۔''

۱۸۵۷ء کے 'پہلی جنگِ آزادی' کے بعد انگریزوں کے مظالم خصوصی طور پر مسلمانوں کے تئیں اتنے دھاردار ہو گئے تھے کہ اُنھیں جہاں کہیں بھی مسلمان دکھ جاتے یا مل جاتے تو بغیر انھیں موت کے گھاٹ اُتارے نہیں چھوڑتے تھے۔ دہلی میں ان کے ہاتھ جو بھی لگا انگریزوں نے انھیں پھانسی پر لٹکا دیا یا اس کا سر قلم کر دیا۔ غرض کہ ہزاروں لوگوں کو

پھانسی پر لٹکا دیا گیا یا انھیں موت کے گھاٹ اتار دیا گیا۔ جو بچ گئے وہ اپنی جان بچانے کی غرض سے جنگلوں اور بیابانوں میں پناہ لے کر اپنی جان بچائی۔ اس ضمن میں محمد حسین آزاد کے والد محمد باقر کا نام لینا بیجا نہ ہوگا۔ انھیں بھی انگریزوں نے پھانسی کی سزا سنائی تھی اور محمد حسین آزاد کسی طرح اپنی جان بچانے میں کامیاب ہوئے تھے۔

چوں کہ انگریز مسلمانوں کو سبک دوش کر کے ہی حکومت پر قابض ہوئے تھے اس لئے اس قتل و غارت گری اور ستم ظریفی کی سب سے زیادہ نقصان انھیں کو اُٹھانی پڑی۔ انگریزوں کو اس بات کا خدسہ ہی نہیں بلکہ پورا یقین بھی تھا کہ اگر مسلمانوں کو موت کے گھاٹ نہ اُتارا گیا اور انھیں خوف زدہ نہیں کیا گیا تو ہوسکتا ہے کہ دوبارہ وہ بغاوت پر آمادہ ہو جائیں۔ آیئے ایک اور دوسرے شعر پر غور کیا جائے۔

کوئی ویرانی سی ویرانی ہے، دشت کو دیکھ کر گھر یاد آیا۔

مذکورہ بالا شعر پر غور کریں جو کہ مسلمانوں کی اُسی بد سے بدتر حالات کی عکاسی کرتی ہے۔ ظاہر ہے یہاں غالبؔ، میر تقی میرؔ کی مثنوی 'گھر کا حال' کے طرز پر اپنے گھر کی ویرانی اور تباہی و بربادی کا تذکرہ کرتے ہیں۔ غالبؔ اپنے گھر کی ویرانی اور تباہی و بربادی کا تذکرہ کرتے ہوئے اُس کی تشبیہ 'دشت' سے دیتے ہیں۔ یعنی دشت کی ویرانی اور تنہائی کو دیکھ کر گھر کی ویرانی اور تنہائی کا واضح طور پر اندازہ کیا جاسکتا ہے۔ اسی طرح غالب کے بہت سے دوسرے اشعار ہیں جن میں اُن کا عہد اور زمانہ صاف طور پر دکھائی دیتا ہے۔

مرزا غالبؔ کی شاعری میں فلسفے اور تخیّل کا ایسا میل ہے کہ ان کے خیالات پیچیدہ اور مشکل ہوتے ہوئے بھی قلب پر تیر کی طرح جا کر بیٹھ جاتے ہیں۔ انھوں نے نثر و نظم دونوں میں اپنی راہ الگ نکالی ہے۔ اردو میں انھوں نے چند قصیدے اور زیادہ تر غزلیں کہیں ہیں۔ اکثر اردو قصیدے ایرانی شعراء کے قصائد کے ڈھنگ پر لکھے جاتے تھے۔ اور ان کے طرز میں تبدیلی نامناسب سمجھی جاتی تھی۔ لیکن غالبؔ نے اپنے قصائد میں نیا رنگ پیدا کیا اور غزلوں میں تو کئی طرح کے تجربات کرنے کے بعد اپنی راہ آپ بنالی جو بے مثال ہے۔ ان کا اردو دیوان بہت مختصر ہے کیونکہ احباب کی رائے سے دیوان سے فارسی کے مشکل اشعار کو نکال دئے۔ ان کی شعری خصوصیات میں حقیقت پسندی، طرزِ ادا کا حسن، تازگی، فلسفیانہ عمق، جذباتی احساس اور جدّت اس طرح سے مخلوط ہیں کہ کوئی دوسرا شاعر ان کے برابر نہیں لایا جاسکتا۔ زندگی کو لطف و مسرت کے ساتھ بسر کرنے کی تمنّا ان میں بہت قوی تھی۔ مگر وہ دور اس میں خارج تھا۔ اس لئے شخصیت اور روبہ انحطاط معاشرے کے تصادم کی بڑی خوبصورت تصویریں ان کے کلام میں مل جاتی ہیں۔ یہ صحیح ہے کہ ان کی شاعری کوئی فلسفیانہ آدرش پیش نہیں کرتی مگر زندگی کی قوت، عظمت اور حسن کے گیت گا کر زندگی سے محبت کرنا ضرور

سکھاتی ہے۔اس لئے کوئی شخص بھی جو زندگی کی گہرائیوں کو سمجھنا اور ان میں داخل ہونا چاہتا ہے اسے غالبؔ کی شاعری میں بہت کچھ ملے گا۔غالبؔ کو انیسویں صدی کے نمائندہ شعراء کی شکل میں پیش کیا جاسکتا ہے۔حلانکہ دوسرے شعراء بھی زندگی کے ان دکھوں کا بیان کیا ہے جو ایک مٹتی ہوئی تہذیب عطا کرتی ہے۔مگر ان کے احساس کے معار اور غالبؔ کا فنکارانہ احساس میں بڑا فرق ہے جو ان کی پوری شاعری میں پھیلا ہوا ہے۔چند اشعار ملاحظہ ہو۔

یہ نہ تھی ہماری قسمت جو وصالِ یار ہوتا۔ اگر اور جیتے رہتے یہی انتظار ہوتا۔

وہ آئیں گھر میں ہمارے خدا کی قدرت ہے۔ کبھی ہم ان کو کبھی اپنے گھر کو دیکھتے ہیں۔

نیند اس کا ہے، دماغ اس کا ہے، راتیں اس کی ہیں۔ تیری زلفیں جس کے بازو پر پریشاں ہوگئیں۔

ہم کو معلوم ہے جنّت کی حقیقت لیکن۔ دل کو خوش رکھنے کو غالبؔ یہ خیال اچھا ہے۔

آہ کو چاہئے اک عمر اثر ہونے تک۔ کون جیتا ہے تیرے زلف کے سر ہونے تک۔

عاشقی صبر طلب اور تمنّا بے تاب، دل کا کیا رنگ کروں خونِ جگر ہونے تک۔

اُردو میں غالبؔ کی شاعری کے تعلق سے ایک سے بڑھ کر ایک مستند کتابیں اور مقالے منظرِ عام پر آچکے ہیں۔ اُن کے متعلق جتنا لکھا گیا اور اب بھی لکھا جارہا ہے اُتنا اُردو کے کسی دوسرے شاعر یا نثر نگار کے بارے میں نہیں لکھا گیا۔تقریباً ایک صدی سے زیادہ عرصے سے ناقدین کی جانب سے غالب کو سمجھنے اور سمجھانے کی کوشش جاری ہے۔ظاہر ہے ایسے میں غالب کی شاعری میں کوئی نئی بات اور کوئی نیا پہلو کی نشاندہی کرنا جوئے شیر لانے کے مترادف ہے۔ باوجود اس کے غالبؔ کی شاعری کے متعلق کچھ کہنے کی ہمّت و جسارت کررہی ہوں۔

اپنی زندگی میں ہم جو تجربہ کرتے ہیں یا ہم پر جو کچھ گذرتی ہے وہی چوٹیں تخیل میں جاکر تخلیقِ ادب کی تحریک کرتی ہیں۔شاعر یا ادیب میں جذبات کی جتنی ہی شدّت ہوتی ہے اتنا ہی اس کا کام دلکش اور بلند ہوتا ہے۔ظاہر ہے شاعر اور ادیب عام انسانوں سے زیادہ حساس اور جذباتی ہوتا ہے اور وہ اپنے زمانے اور عہد سے ناخن کی طرح جڑا ہوتا ہے۔اس لحاظ سے جب ہم غالبؔ کے اشعار کا مطالعہ کرتے ہیں تو یہ بات واضح ہوجاتا ہے کہ وہ اپنے عہد سے پوری طرح وابسطہ تھے اور ان کی شاعری میں ان کے عہد کی عکاسی واضح طور پر ہوتی ہے۔یوں تو ان کا عہد ۱۷۹۷ء سے ۱۸۶۹ء تک کے زمانہ پر استوار ہے۔لیکن ان کی شاعری کے مطالعے سے اکثر محسوس ہوتا ہے کہ غالبؔ نہ صرف اپنے عہد اور زمانے کی ادبی، سیاسی، سماجی اور تہذیبی و معاشرتی حالات و کوائف سے واقف تھے بلکہ اپنے قبل اور بعد کے عہد اور زمانے کی بھی اچھی خاصی معلومات رکھتے تھے۔

غالبؔ کے ہم عصر شعراء میں مومنؔ اور ذوقؔ جیسے قد آور شعراء بھی موجود تھے۔ لیکن ان کی خوددار طبیعت نے انھیں اس کی کبھی اجازت نہیں دی کہ وہ اپنے معاصرین شعراء میں سوائے مومنؔ کے کسی کو اپنے مدِ مقابل سمجھتے۔ مومنؔ کی شاعری کے وہ دلدادہ ضرور تھے لیکن یہاں بھی وہ اپنی دوستی کا حق ادا کرتے نظر آتے ہیں۔ ہاں اس ضمن میں وہ میر تقی میرؔ کو ضرور اس قابل سمجھتے تھے کہ ان کی استادی کا لوہا مانا جائے۔ ایک جگہ اپنی استادی کا دعویٰ کرتے ہوئے میرؔ کے کلام کی خوبیوں کا تذکرہ کرتے ہوئے وہ کہتے ہیں:-

ریختے کے تمھیں استاد نہیں ہو غالبؔ، کہتے ہیں اگلے زمانے میں کوئی میرؔ بھی تھا۔

غالبؔ! اپنا یہ عقیدہ ہے، بقولِ ناسخؔ، آپ بے بہرہ ہے، جو معتقدِ میرؔ نہیں۔

میرؔ کے شعر کا احوال کہوں کیا غالبؔ!، جس کا دیوان کم از گلشنِ کشمیر نہیں۔

ہیں اور بھی دنیا میں سخنور بہت اچھّے، کہتے ہیں کہ، غالبؔ کا ہے اندازِ بیاں اور۔

غالب کی شاعری کے متعلق مذکورہ بالا دعوے کی تصدیق اور وضاحت ماہرِ غالبیات پروفیسر مالک رام کے درجِ ذیل قول سے ہوتی ہے:-

''انھوں نے کسی کو 'جاہل' کی جگہ 'کامل' کہہ دیا ہو، یہ الگ بات ہے۔ ورنہ ہے یہی کہ وہ معاصرین کا تو کیا ذکر اپنے آپ کو جملہ شعرائے اُردو سے برتر سمجھتے تھے۔ اس میں استثناء صرف میرؔ کا ہے؛ میرؔ کو وہ ضرور اپنے برابر کا شاعر سمجھتے ہیں۔''

غالبؔ اردو کے سب سے بڑے غزل گو شاعر اور فنکار تسلیم کئے جاتے ہیں۔ حالانکہ اُنھوں نے تقریباً ہر صنفِ سخن پر طبع آزمائی کی ہے لیکن ان کی اصل شناخت غزل کے سبب ہی ہے۔ جوں جوں زمانہ گذرتا جا رہا ہے توں توں ان کی اور ان کے شاعری کی مقبولیت میں اضافہ ہوتا جا رہا ہے۔ شاید انھیں بھی اس کا احساس تھا اور اسی کو ذہن میں رکھ کر انھوں نے مندرجہ ذیل اشعار کہے ہوں گے:-

اس سادگی پر کون نہ مر جائے اے خدا۔ لڑتے ہیں اور ہاتھ میں تلوار بھی نہیں۔

ہو کے عاشق، وہ پری رخ اور نازک بن گیا، رنگ کھلتا جائے ہے، جتنا کہ اڑتا جائے ہے۔

ہوئی مدّت کہ غالبؔ مر گیا، پر یاد آتا ہے، وہ ہر یک بات پر کہنا کہ یوں ہوتا تو کیا ہوتا۔

رگوں میں دوڑتے پھرنے کے ہم نہیں قائل، جب آنکھ سے نہ ٹپکا تو پھر لہو کیا ہے۔

غرض کہ جیسے جیسے وقت اور زمانہ بیتتا جارہا ہے ان کی ہر دلعزیزی میں اضافہ ہوتا جارہا ہے۔ اُن کے اشعار میں جدّت، ندرت، تازگی، خیال کی پختگی، خلوص، برجستگی، شوخی اور وسعت کی ہمہ گیری کا خوبصورت امتزاج ملتا ہے۔ حالانکہ ان کی پوری زندگی پریشانی اور تنگ حالی میں گذری۔ تاعمر ہر طرح کے مصائب، مشکلات اور پریشانیوں سے دوچار رہے باوجود اس کے ان کی شاعری میں بانکپن اور زندہ دلی کی کیفیت پائی جاتی ہے۔ یہ حقیقت ہے کہ ان مصائب، دقّتوں اور پریشانیوں کو وہ کبھی اپنے اوپر غالب نہیں ہونے دیا۔ اس کی وضاحت ان کے درجِ ذیل اشعار سے ہوتی ہے۔

رنج سے خوگر ہوا انساں، تو مٹ جاتا ہے رنج، مشکلیں مجھ پر پڑیں اتنی کہ آساں ہوگئیں۔

رات دن گردش میں ہیں سات آسماں، ہو رہے گا کچھ نہ کچھ گھبرائیں کیا!

موجِ خوں سر سے گزر رہی کیوں نہ جائے، آستانِ یار سے اٹھ جائیں کیا؟

کیوں گردشِ مدام سے گھبرا نہ جائے دل؟، انسان ہوں، پیالہ و ساغر نہیں ہوں میں۔

اِن آبلوں سے پاؤں کے گھبرا گیا تھا میں، جی خوش ہوا راہ کو پرخار دیکھ کر۔

دل ہی تو ہے، نہ سنگ و خشت، درد سے بھر نہ آئے کیوں؟،
روئیں گے ہم ہزار بار، کوئی ہمیں ستائے کیوں

مرزا غالب کی شخصیت میں کچھ عجیب و غریب خصوصیتیں جمع ہوگئی تھیں جو اس عہد کے بہت کم شعراء میں پائی جاتی ہے۔ مثلاً اُن کی خودداری اور انکساری، اُن کے ذہن کی جودت، بات میں بات پیدا کرنے کی قوت، اُن کا علم اور معلومات، اُن کی فراخدلی، نئی باتوں کو قبول کر لینے کی صلاحیت، دوستی کا نباہ اور محبوب بن جانے کا ڈھنگ یہ سب خصوصیتیں ایسی تھیں جو اُن کو عظیم اور ہر دل عزیز بناتی تھی۔ چند اشعار ملاحظہ ہو۔

یارب! وہ نہ سمجھے ہیں، نہ سمجھیں گے مری بات، دے اور دل ان کو، جو نہ دے مجھ کو زباں اور۔

آج ہم اپنی پریشانیِ خاطر ان سے، کہنے جاتے تو ہیں، پر دیکھیے کیا کہتے ہیں۔

مہرباں ہو کے بلالو مجھے، چاہو جس وقت، میں گیا وقت نہیں ہوں کہ پھر آ بھی نہ سکوں۔

جب ہم کسی شاعر کی شاعری کا مطالعہ کرتے ہیں اور پھر اس پر تنقید کرتے ہیں تو ان تین باتوں پر ہماری نظر ہوتی ہے۔ شاعر نے کیا کہا، شاعر نے کیوں کہا اور کس طرح کہا یعنی انداز بیاں کیا ہے۔ نیچے ان تینوں سوالوں سے بحث کی جا رہی ہے۔ پہلے سوال کا جواب یہ ہے کہ مرزا غالب نے اپنے کلام میں زندگی کی عکاسی اور محبت کی ترجمانی کی ہے۔ حسن

وعشق کی کیفیات اس تفصیل سے بیان کی ہے کہ شاید ہی کوئی گوشہ ان کی نگاہ سے اوجھل رہا ہو۔ سچ تو یہ ہے کہ اس سلسلے میں وہ اپنا ثانی نہیں رکھتے۔ وارداتِ قلبی کے علاوہ انھوں نے اپنے کلام میں حقائق و معاروف بھی بیان کئے ہیں اور حیات و کائنات کے مسائل بھی نظم کئے ہیں۔

دوسرے سوال کا جواب یہ ہے کہ ملکہ شاعری خود فطرت نے انھیں عطا کیا تھا۔ وہ شاعرانہ دل و دماغ لے کر پیدا ہوئے تھے۔ انھوں نے شاعری رسماً نہیں بلکہ ان کی طبیعت کا اقتضا یہی تھا۔ تیسرے سوال کے جواب میں ان کی شاعری کی کئی خوصوصیات درجِ ذیل ہیں۔ واضح ہو کہ ان کے کلام کی پہلی اور سب سے بڑی خصوصیت ان کا وہ اندازِ بیان ہے جس پر ان کی شاعرانہ عظمت کا قصر تعمیر ہوا ہے۔ جس کا اعتراف وہ خود کرتے ہوئے اس کی طرف اشارہ کچھ یوں کرتے ہیں۔

ہیں اور بھی دنیا میں سخنور بہت اچھّے ، کہتے ہیں کہ، غالبؔ کا ہے اندازِ بیاں اور۔

اب سوال یہ ہے کہ آخر۔۔۔۔ اندازِ بیان سے کیا مراد ہے۔ کسے کہتے ہیں اندازِ بیان۔۔۔۔ واضح ہو کہ اس کا جواب ہمیں مرزا غالب کے مختلف اشعار اور ان کے ناقدین کی باتوں سے پتہ چلتا ہے۔ جس بات کو انھوں نے اندازِ بیان کا نام دیا ہے وہ دراصل میں ان کی جدّت طرازی ہے۔ جو زبان، تراکیب، خیالات، محاکات، الفاظ، تشبیہات، استعارات و کنایات غرض کہ تمام لوازم شاعری میں پائی جاتی ہے۔

مرزا غالب کا ذہن، دل و دماغ اور مزاج ہی کچھ ایسا تھا کہ وہ ہمیشہ عام روش سے ہٹ کر سوچتے، غور کرتے اور تخلیق کرتے تھے۔ چند اشعار پیش ہے جن میں نیا پن اور اچھوتا پن چھایا ہوا ہے۔

بسکہ دشوار ہے ہر کام کا آساں ہونا ، آدمی کو بھی میسّر نہیں انساں ہونا۔

نہ تھا کچھ، تو خدا تھا؛ کچھ نہ ہوتا، تو خدا ہوتا ، ڈبویا مجھ کو ہونے نے نہ ہوتا میں، تو کیا ہوتا۔

جدّت طرازی نے مرزا غالب کو اس قدر بے چین کیا کہ وہ نئے نئے تشبیہات و استعارات وضع کرنے لگے۔ چند مثال پیشِ خدمت ہے۔

غمِ ہستی کا اسد کس سے ہو جز مرگِ علاج ، شمع ہر رنگ میں جلتی ہے سحر ہونے تک۔

بوے گل، نالۂ دل، دودِ چراغِ محفل، جو تری بزم سے نکلا، سو پریشاں نکلا۔

اور بازار سے لے آئے اگر ٹوٹ گیا، جامِ جم سے میرا جامِ سفال اچھا ہے۔

اردو ادب کے بڑے نقاد پروفیسر آل احمد سرور کی رائے دیکھئے۔

''مرزا غالب کے قصرِ شاعری کی بنیاد جدّت طرازی پر ہے اور اس جدّت طرازی میں جدّتِ تخیل، جدّتِ طرزِ ادا، جدّتِ استعارات وتشبیہات، جدّتِ محاکات وجدّتِ الفاظ آجاتے ہیں۔''

کلامِ غالب کی دوسری خصوصیت مشکل پسندی ہے۔ یعنی وہ معمولی سی بات کو بھی عسیرالفہم انداز سے بیان کرتے ہیں۔

تیسری خصوصیت رمزیہ انداز ہے۔ رمزیہ دراصل کنایہ کی ایک قسم ہے یعنی جس میں حقیقی معنی تک پہنچنے کے لئے کوئی اشارہ نہیں ہوتا۔ شاعر جو کچھ کہنا چاہتا ہے اس کے لئے مناسب الفاظ استعمال نہیں کرتا ہے بلکہ مختلف پیرایہ بیان اختیار کرتا ہے۔ مثلاً

کوئی ویرانی سی ویرانی ہے!، دشت کو دیکھ کے گھر یاد آیا۔

دلِ ناداں! تجھے ہوا کیا ہے؟، آخر اِس درد کی دوا کیا ہے؟

دوسرے شعر میں شاعر عشق کو لاعلاج بیماری کہنا چاہتا ہے مگر اس کو استفہامیہ انداز میں کہتا ہے۔ چوتھی خصوصیت کلام غالب کی ایجاز ہے جو دریا کو کوزے میں بند کر دینے کا دوسرا نام ہے۔ غالب کے اکثر اشعار ایسے ہیں کہ دو مصروعوں میں معنی کی ایک پوری دنیا آباد ہے۔ انھیں اس بات کا احساس بھی تھا۔ چنانچہ کہتے ہیں کہ

گنجینۂ معنی کا طلسم اس کو سمجھئے، جو لفظ کہ غالب مرے اشعار میں آوے۔

مجھ تک کب ان کی بزم میں آتا تھا دورِ جام، ساقی نے کچھ ملا نہ دیا ہو شراب میں۔

پانچویں خصوصیت جو بے حد اہم ہے وہ ان کی ہمہ گیر طنزیہ ظرافت ہے جس کا مقصد محض ہنسنا ہنسانا نہیں بلکہ زندگی کی تلخیوں کو شیریں اور خوش گوار بنانا ہے۔ ان کا مزاح یک رخی نہیں ہے وہ خود پر بھی طنز کرتے ہیں اور دوسروں پر بھی۔

یہ مسائل تصوّف یہ تیرا بیان غالب، تجھے ہم ولی سمجھتے جو نہ بادہ خوار ہوتا۔

ان پریزادوں سے لیں گے خلد میں ہم انتقام، قدرتِ حق سے یہی حوریں اگر واں ہو گئیں۔

مزاح کی مثالیں دیکھیں:-

اس سادگی پر کون نہ مر جائے اے خدا، لڑتے ہیں اور ہاتھ میں تلوار بھی نہیں۔

قرض کی پیتے تھے مے لیکن سمجھتے تھے کہ ہاں، رنگ لائے گی ہماری فاقہ مستی ایک دن۔

مختصر یہ کہ مرزا غالب کی غزل گوئی کا جائزہ لیتے ہوئے ہم نے جو کچھ نتیجے اخز کئے ہیں اس کا خلاصہ یہ ہے کہ

مرزا غالب ایک عبوری دور کے شاعر تھے۔ معاشرے میں تبدیلیاں آ رہی تھیں اور سیاسی صورتِ حال کے بدلنے سے تہذیبی قدریں بھی بدل رہی تھیں۔ مرزا غالب نے ان تبدیلیوں سے اثرات قبول کرتے ہوئے اردو غزل کو پہلی بار حدیثِ دلبری کی جگہ حکائت زندگی بنانے کی کوشش کی اور اس میں کامیاب بھی ہوئے۔ مرزا غالب کے عہد تک آتے آتے اردو غزل کے خدوخال متعین ہو چکے تھے اور غالب نے ان روایتوں کا بھی کہیں کہیں ساتھ دیا۔ عشقِ مجازی اور عشقِ حقیقی کے مضامین بیان کئے۔ تصوّف کے دوسرے پہلوؤں کو بھی برتنے کی کوشش کی۔ مرزا غالب فارسی زبان کے ماہر اور بڑے زبردست شاعر تھے۔ اپنے فارسی کلام کے مقابلے میں اپنی اردو شاعری کو ''بے رنگ من است'' کہا کرتے تھے۔ لیکن آج ان کی شہرت اور مقبولیت ان کے اسی اردو کلام کے باعث ہے۔

مرزا غالب نے اردو غزل کے دامن کو بہت وسیع کیا۔ اس کے اندر نئے نئے خیالات و مضامین کو جگہ دی۔ نئی نئی راہیں نکالی، عشق و عاشقی اور گل و بلبل کی کہانیوں پر اکتفا نہیں کی بلکہ ان کے علاوہ فلسفہ تصوّف کو اردو غزل میں داخل کیا۔ غالب کے انوکھے اندازِ بیان نے نئے نئے مضامین کو حسین تر بنا کر پیش کیا ہے۔ غالب کے کلام میں شوخی بھی ہے اور متانت بھی ہے۔ تخیل کی بلند پروازی بھی ہے اور معنی آفرینی بھی۔ غرض کہ غالب کا مختصر دیوان حسین رنگا رنگ پھولوں کا ایک خوبصورت گلدستہ ہے۔ معتبر و معطر، تازہ، شگفتہ اور سدا بہار جس کی خوشبو کبھی کم نہیں ہوگی۔

نگراں

ڈاکٹر سورج دیو سنگھ

صدر شعبہ اردو، مگدھ مہیلا کالج، پٹنہ

پیشکش

کہکشاں پروین، رول نمبر ۴۱۸

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मल्हार अंग के रागों का प्रकार

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सारांश : मल्हार अंग के रागों को ऋतु कालीन राग माना जाता है। मल्हार अंग के राग वर्षा ऋतु में किसी भी समय में गाए बजाए जाते हैं। इस अंग के रागों में प्राय: वर्षा ऋतु का वर्णन मिलता है। मल्हार अंग के रागों की उत्पत्ति काफी थाट से मानी जाती है।

शब्द कुंजी : मल्हार, राग, किंवदंती, राग दीपक

भूमिका

हिन्दुस्तानी संगीत पद्धति में मल्हार राग अत्यन्त प्रचलित राग है। यह राग अपने पौराणिक कथाओं के अनुसार ही प्रचलित हुआ। मल्हार के संबंध में एक किंवदंती मिलती है कि अकबर के दरबार में एक बार सुप्रसिद्ध गायक तानसेन जी ने राग दीपक गाया तो सारे दिए स्वयं जल उठे थे और उस्ताद तानसेन जी के बदन में जलन उत्पन्न हुई तब उनकी पुत्री ने मल्हार राग गाया जिससे उसी समय वर्षा होने लगी और तानसेन जी की ज्वलंत पीड़ा शांत हुई। तभी से मल्हार राग संगीत जगत में अमर हो गया। ऐसी मान्यता है कि सही ढ़ंग से अगर मल्हार राग गाया – बजाया जाय तो सच में वर्षा का आगमन हो जाता है।

भारत के नाट्य शास्त्र में 'मल्हार भूर' शब्द मिलता है। यह मल्हार शंकर का नाम है कुछ विद्वान इसे कृष्ण का नाम भी बताते है। श्री जयसुख लाल त्रि0 शाही जी की पुस्तक 'मल्हार के प्रकार' में मल्हार का अर्थ है–'मल का हरण करने वाला', अर्थात् वर्षा ऋतु में पृथ्वी का कीचड़ और मैल वर्षा के पानी से साफ हो जाता है। इसी प्रकार मल्हार गाने से मनुष्य के मन का आन्तरिक मैल साफ हो जाता है। अर्थात् शंकर या कृष्ण का नाम लेने से भी मनुष्य के भीतर के विकार परिष्कृत हो जाएगा, ऐसा इस राग की मान्यता है।

मल्हार अंग की विशेषता

मल्हार राग ऋतु संबंधी राग है, अत: वर्षा ऋतु में इस राग को किसी भी समय गाया–बजाया जा सकता है। अन्य ऋतु में इस राग का गायन–वादन समय सायंकाल या रात्रिकाल माना जाता है। मल्हार राग की बंदिशों में वर्षा, बिजली, विरह, मिलन, प्रभुशक्ति इत्यादि का वर्णन मिलता है।

मल्हार की प्रकृति मेघ के समान ही धीर, वीर, सौम्य, गंभीर तथा रौद्र होती है। इस राग के विस्तार में आलाप मींड़, कण और गमक की प्रधानता होती है।

मल्हार के मुख्य अंग

जिस राग में म रेम म रेम म रेम, अगर रे म रे, रे प, म रे, इत्यादि स्वर संगीत बार–बार दिखाई देता मुक्त मधयम, मधयम पर मपमम, – ऐसा एक विशिष्ट तरह का खटका निप, निमप और सा नि सा नि सांनिनि, –पि इस तरह का कणयुक्त दोहराया हुआ निषाद, आंदोलित गन्धार इत्यादि हो, तो इससे यह स्पष्ट होता है कि यह राग मल्हार का ही एक प्रकार है।

शास्त्रीय संगीत जगत में मल्हार अंग के अन्तर्गत विद्वानों के द्वारा कई रागों का आविष्कार किया जाता है।

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जिनका नामोल्लेख हमें विभिन्न ग्रंथों में प्राप्त होता है। जिनके नाम इस प्रकार है - मिया मल्हार, मेघ मल्हार, गौड़ मल्हार, जयन्त मल्हार, सुरमल्हार आदि।

- **राग मिया-मल्हार**

राग मिया मल्हार की रचना संगीत-सम्राट तानसेन ने की थी। परंतु इस संबंध में कोई ठोस प्रमाण उपलब्ध नहीं है।

सर्वाधिक लोकप्रिय राग मिया-मल्हार कॉफी थाट जन्य राग है। यह राग मल्हार अंग का राग है इसमें कोमल गन्धार के अतिरिक्त दोनों निषाद तथा अन्य स्वर शुद्ध लगते है। इस राग की जाति संपूर्ण है। इस राग का वादी स्वर ''म'' तथा संवादी स्वर ''सा'' है। साधारणत: इस राग को वर्षा ऋतु के अतिरिक्त रात्रि के द्वितीय प्रहर में गाया-बजाया जाता है। इस राग का विस्तार तीनों सप्तकों में होता है। यह राग पूर्वांग प्रधान राग है। अत: इस राग का सौन्दर्य मन्द्र तथा मध्य सप्तक में अधिक निखरकर आता है।

इस राग की मुख्य विशेषता यह है कि इस राग में दोनों निषाद का प्रयोग होता है। आलाप में दोनों का एक साथ प्रयोग इस राग की रंजकता को बढ़ाता है।

''रे म रे सा, नि धा नी सां'' परंतु दोनों निषाद का यह प्रयोग किसी योग्य गुरु के सम्मुख ही सीखना श्रेयष्कर रहेगा।

ग, म, रे, सा का प्रयोग इस राग के अवरोह में करते है। जिसके कारण ग वक्र रहता है। आरोह में शुद्ध तथा अवरोह में कोमल नी का प्रयोग होता है नि धा, नि सा, नि प।

अवरोह में ध वर्जित है, नि नि प म

मिया-मल्हार में रेप की संगति मल्हार अंग को दर्शाती है तथा ग म रे सा की संगति कान्हड़ा अंग की है।

इस राग का समप्रकृति राग बहार है। इस राग का चलन है - रे * * सा नि ध नि सा, म रे * * प, म प नि ध नि सां, सांनी प, ग् * म रे * * ।।

- **राग-सूरमल्हार**

यह मल्हार का एक प्रकार है। ऐसी मान्यता है कि शहनशाह अकबर के दरबार में एक रामदास नामक गायक थे उनके सुपुत्र सूरदास के द्वारा यह राग प्रचार में लाया गया।

यह सारंग अंग से गाया जाता है। कई गुणीजन इसमें गंधार, धैवत, वर्ज्य करते हैं, लेकिन प्रचार में यह ज्यादा भाग सिर्फ गंधार वर्ज्य करके अवरोह में धैवत लेकर गाया जाता है। कई गुणीजन राग हानि न होवे इतना ध्यान रखकर आरोह-अवरोह दोनों में थोड़ा सा धैवत लेते है। जो अवरोह में धैवत लेते हैं वे ख़ास करके आलाप में 'सां नि ध प' इस तरह 'सां' पर ठहर के 'नि म प' सां नि ध प' इस तरह से लेते हैं।

जो इसमें गंधार लेते हैं वे 'रे गा सा रे' 'गमरेसा' इस तरह कोमल गंधार का अल्प प्रयोग करते है। यह प्रकार ख़ास करके ध्रुपद, धमार में ज्यादा प्रचलित है। लेकिन किसी ख़्याल के गीतों में भी इसका अल्प प्रयोग किया जाता है।

इसमें सारंग अंग आगे आता है और जानकारों के मत हैं कि इसमें सारंग और मल्हार का संयोग है। 'सा, म, और प, का प्राबल्य इसमें ज्यादा रहता है और तार 'सां' भी चमकता रहता है।

वादी स्वर सा और संवादी प माना जाता है। कई गुणीजन वादी म, प और संवादी सा मानते हें लेकिन पहला मत अधिक ग्राह्य है। आरोह में ग, ध और अवरोह में ग वर्ज्य होने से इसकी जाति औडव-षाडव है।

'म, प, नि ध, प, सां निधप, मप, निसां, रेंनि, निधप, मरे, सारेनिसा, सां, निमप, 'यह समुदाय बार-बार प्रयोग में आता है। 'सा, रेम, प, म, नि, ध, प' से सामंत सारंग का भास होता है, लेकिन 'म नि' और 'रें नि म प' यह स्वर संगति और -'मरे' मींड से सारंग दूर होता है और मल्हार आगे आता है। वर्षा ऋतु में यह राग कभी भी गाया जा सकता है और अन्य ऋतुओं में प्रात: कला के दूसरे प्रहर में यह राग गाया जाता है। सूरमल्हार में प्राय: वर्षा ऋतु का वर्णन या, भक्तिभाव का वर्णन रहता है।

- **राग मेघ-मल्हार**

यह राग भी मल्हार का एक प्रकार है। यह राग बहुत ही सुंदर और गंभीर प्रकृति का है। इस राग का विस्तार तीनों सप्तक में किया जाता है। इस राग में रे, प की संगति मल्हार अंग प्रदर्शित करती है। गुरुमुख से सीखने से ही इस राग को आत्मसात किया जा सकता है।

इसकी उत्पत्ति काफी थाट से होती है। इस राग में कोमल निषाद का प्रयोग होता है। इस राग में गंधार तथा धैवत स्वर वर्जित है।

इस राग की जाति औडव-औडव है। इस राग का वादी स्वर 'मधयम' तथा संवादी, स्वर षडज है। इस राग का गायन समय रात्रि का द्वितीय पहर है। परंतु वर्षा ऋतु में यह राग हर समय गाया-बजाया जाता है। इस राग में रे (ऋषभ) तथा प (पंचम) की संगति मधुर होती है। इस राग का विस्तार मन्द्र, मध्य तथा तार तीनों सप्तकों में होता है। 'म रे प' मल्हार राग का यह स्वर विन्यास इसमें प्रमुख रीति से आता है। ऋषभ पर होने वाले आंदोलन से इस राग को पहचानने में सहायता मिलती है। जिसे मध्यम कण लगाते हुए कई बार प्रयुक्त किया जाता है। इस राग की चलन इस प्रकार है :- ''रे म, रे सा नी प नि सा, रे रे, रे म म, रे, सा रे म रे, सा नि प, म प सा, रे सां, नि सां रें मं रें, सां, नी प, सां, नी प, रे रे म रे सा ।।''

- **राग गौड-मल्हार**

इस राग के नाम से ही स्पष्ट होता है कि यह राग दो रागों के मिलने से बना है। इस राग की उत्पत्ति समाज थाट से मानी जाती है। इस राग में भी दोनों निषाद प्रयोग किया जाता है। शेष शुद्ध रूप में प्रयोग किए जाते है।

इस राग का वादी स्वर मध्यम तथा संवादी स्वर षडज है। इस राग में षडज स्वर पर न्यास किया जाता है। इस राग की जाति औडव-वक्र सम्पूर्ण है।

इस राग का गायन-वादन समय रात्रि का द्वितीय प्रहर है, तथा वर्षा ऋतु में इसे किसी भी समय गाया-बजाया जा सकता है। इस राग में मेरे म रे म रे प मल्हार अंग का स्वर समूह प्रयोग होता है। इस राग का वादी 'म' तथा संवादी षडज मानते है। इस राग में पंचम स्वर पर न्यास किया जाता है। इस राग में ध्रुपद, धमार, ख़्याल इत्यादि गाये जाते है।

इस राग के उत्तरांग में 'म प ध नि सां' स्वर समूह का प्रयोग होता है। यह राग पूर्वांग प्रधान राग है। यह राग गायन के लिए अधिक उपयुक्त है। इसका विस्तार मध्य तथा तार सपतक में अधिक होता है।

इस राग की चलन इस तरह से है-

सा रे म प ध, म प ध सां, ध नि प, म प ग, रे प, म प ध सां, ध प, म ग म रे सा, ग म रे प।

उपसंहार

प्रस्तुत लेख में मल्हार राग का संक्षिप्त वर्णन किया गया है। मल्हार राग अत्यधिक प्राचीन राग होने के कारण आज भी जनमानस में अति लोकप्रिय है। इस आलेख में मल्हार राग के अंग तथा उसके स्वर समुदाय का वर्णन किया गया है। मल्हार राग वर्षा कालीन राग है। परंतु इसे विशेष समय में अन्य शेष ऋतुओं में भी गाया-बजाया जाता है। मल्हार राग अति मधुर तथा गंभीर प्रकृति का राग है। इस लेख मे उसके कुछ प्रकारों को एवं उनकी विशेषताओं को दर्शाया गया है।

संदर्भ ग्रंथ सूची

- राग प्रवीण, पं. रामकृष्ण व्यास
- मल्हार के प्रकार, जय सुखलाल टी. शाह
- अभिनव गीतांजली, पं. रामाश्रय झा

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SOME ECONOMICALLY IMPORTANT PLANTS OF MAGADH MAHILA COLLEGE, PATNA

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ABSTRACT : *The Magadh Mahila College is rich in plant vegetation. A variety of luxurious plants adds the specific beauty in the college and makes the environment pollution free. Most of them are economically important. Our project will describe some of them. We all as common people know very well about these economically important plants. Here some specific features will also be discussed, which will enhance our knowledge, discard the local myth, enrich the nutritional value of our food, make healthy and cure from different diseases. Mango, Jamun, Guava, Pomegranates, Papaya, Banana, Teak, Tulsi, Aloe-vera, Sarpgandha, cardamom, Betel, Woodapple, Jack Fruit and Neem Plants are included in our project.*

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KEY WORDS : Pollution, Environment, Nutrition

INTRODUCTION

The Magadh Mahila College, Patna is a premier institution for women and well known in the region for its value based education, quality teaching and discipline. Established in the year 1946, it is the oldest Government college for girls in Bihar. This is a constituent college under Patna University which is the seventh oldest University in India. This is the first girl's college in the state where teaching in Science subject started as early as 1947.Presently it is imparting education to more than 4500 students in 32 degree and diploma courses in the faculty of Arts, Humanities, Social Sciences, Pure Science, Commerce, Business Administration and Computer Applications at different levels.

The location of the college and its quality teaching, facilities for extra-curricular activities including Sports, Music, N.S.S, N.C.C., Population education club, Gender knowledge centre, Green earth brigade and availability of hostel accommodation inside the campus makes it most sought after institution for girls throughout the state and also from neighbouring states as well as Nepal.

College has a large campus with an adequate green belt extending over 8.5 acres of land, located at the heart of the city. It is situated in the north of Gandhi Maidan ; at the bank of river Ganga. With

a number of fruit bearing trees like Mango, Tamarind, Lemon, Guava, Jackfruit, Giant lemon, Banana; Pomegranate, Kadamb, Jamun, Woodapple etc, and also large number of shade giving trees like Banyan,Peepal, Neem , Gulmohar, and Ashok, the college premises has a quiet and serene setting. Garden with rows of colourful flowers of Rose, Chrysanthemum, Dahlia, Verbena, Flox, Poppy, Xenia, Jarvera etc add to the pleasantness of the campus milieus. A number of shrubs as Kachanar. Harshingar, Plumeria, Nerium, Cardamom, and a variety of medicinal herbs Aloe-vera, Ocimum, Sarpgandha, Betel, Eclipta alba, Paththarchur, Kukraundha, Mint, Achyranthus, Boerhaavia,Tridax, adds luxuriant beauty in the vegetation of the college.

In this project we have take up only few economically important plants, which are used in our day to day life. Most of us use them but are unaware of its real components, contents, usefulness, effectiveness etc. All the plants which are going to be discussed here have been included in our curriculum. We have photographed all the plants discussed here on the spot.

HOLY BASIL (TULSI)

Common name : Tulsi

Botanical name : *Ocimum sanctum*.

Family : Lamiaceae

Tulsi is found in almost all the hostel and premises of our campus and staff quarters.

BOTANICAL CHARACTERISTICS

i) This is an erect, soft, hairy, aromatic herb or undershrub of 30-75 cm height.

ii) Hindus considered it a sacred plant and it is found in every house.

iii) The leaves of this plant are opposite, exstipulate, simple and acute.

iv) Flowers are zygomorphic and hermaphrodite and are arranged in verticillaster inflorescence.

v) The fruit is a caeruleus.

vi) Two types of these plant are known - Green type [Sri Tulsi] and Purple type [krishna Tulsi] .

CHEMICAL COMPOSITION

The leaves of Tulsi contains 71.3% eugenol, 3.2% carvacrol, 20.4% methyl eugenol and 1.7% caryophyllene.

ECONOMIC USES

i) The leaves of basil are stimulant, antiseptic, diaphoretic, stomachic, diuretic and expectorant used in the gastric diseases of children and in liver disorders.

ii) It is used for cough and various respiratory disorders.

iii) The leaf juice is given in chronic fever, haemorrhage, dysentery &dyspepsia, catarrh and bronchitis.

iv) It is used to cure eczema.

v) The plant is a mosquito repellant and is used as prophylactic against malarial fever.

vi) It is also used to treat headache lachrymation, tonsilitis and leucorrhoea.

vii) This is also used in genito-urinary disorders.

MARGOSA TREE (NEEM)

Common name : Neem

Botanical name : *Azadirachta indica*

Family : Meliaceae

Neem is located near central stage and backyard of kalyan hostels.

BOTANICAL CHARACTERISTICS

i) Neem is one of the most popular, auspicious, well known and evergreen tree of 12 -15 m height with a straight trunk and long branches.

ii) Leaves are alternate, exstipulate and compound.

iii) Flowers are cream or yellowish white in colour.

iv) Fruits are 1- seeded and with a hard bony endocarp greenish-yellow when ripe and known as 'Nimboli'.

v) The tree may live for more than 200 years.

CHEMICAL COMPOSITION

Neem contains a large number of chemically diverse and structurally complex bioactive tetranortriterpenoids commonly referred to as C-seco meliacins or limonoids. Some of the potential compounds include a number of azadirachtinoids, salannin, desacetyl salannin, nimbin, azadirachtin desacetyl nimbin, etc.

ECONOMICS USES

i) Neem is the most useful plant to maintain dental hygiene. Fresh twigs are used to clean teeth particularly in pyorrhoea.

ii) The leaves are antiseptic and effective in ulcers and in obstinate skin diseases.

iii) Neem leaves are also used in preventing diseases like measles, chickenpox, smallpox etc.

iv) A fresh leaves paste is used for external application in the treatment of rheumatic pain eczema, and skin diseases like ringworm, scabies, and also in headache and rheumatic affections, foul ulcers. affections, foul ulcers.

v) Fruits are used in leprosy, intestinal worms, piles and urinary-diseases.

vi) It finds application in medicines, soap making, pest control, nitrification inhibition, slow nutrient release manure,. cattle feed, fuel, energy, ete.

vii) It has emerged as the single most important source of pesticides and allied products.

viii) All parts of the tree such as leaf, flower, fruit, seed, kernel, bark, wood, and twig are biologically active, the maximum activity being associated with the seed kernel.

ALOE VERA

Common name : Ghrita - Kumari | Ghigvar

Botanical name : Aloevera

Family : Liliaceae

Aloe vera is located in almost all the hostels of our campus.

BOTANICAL CHARACTERISTICS

i) Aloe vera is a perennial, succulent, plant with stout, thick, cylindrical and woody stem.

ii) The plant is about 2-3 feet high.

iii) Roots are fibrous and fleshy.

iv) Leaves are fleshy, sessile, densely crowded on the short stem, smooth pale green having prickle on their margins.

v) The flowers are borne in cylindrical, terminal racemes arising from the centre of leaf tuft.

CHEMICAL COMPOSITION

Cathartic properties of aloe are due to the presence of glycosides called Aloin.

ECONOMIC USES

i) The fresh juice of Aloe vera leaves are used in liver and spleen ailments and for eye - troubles.

ii) It is regarded as valuable in the treatment of fever, skin-diseases, gonorrhoea, constipation, menstrual suppresion, jaundice and rheumatic affections .

iii) The Pulp of one leaf is given daily in abdominal tumours, piles, sciatica, rheumatism and retention of urine in fevers.

iv) It is an effective remedy for intestinal worms in children

v) It is also used as a flavour ingredients in various food products including alcohlic and non- alcohlic beverages.

vi) Leaves of Aloevera yield a good fibre.

vii) A dye is also obtained from this plant.

viii) In recent times, it is used in the manufacture of cosmetics, lotions and shampoos. etc.

TEAK (SAGWAN TREE)

Common name : Sagun\ Sagwan

Botanical name : Tectona grandis

Family : Verbenaceae

Teak is found in hostel No.-02 and campus.

BOTANICAL CHARACTERISTICS

i) It is a large deciduous tree of 30m height and 2.5-4m in girth.

ii) The leaves are opposite, simple, 25-50cm long, rough and densely covered with reddish brown colour.

iii) The flowers are bracteate, hermaphrodite, hypogynous and pentamerous arranged in large terminal panicles.

iv) The fruit is a hard, bony, 4-lobed nut of 1cm diameter.

v) Teak is one of the most important timber plants of the world. The wood of Teak is extremely durable and hard and resists decay.

PROPERTIES

i) It is one of the hardest, strongest and most durable of all natural woods.

ii) High in natural oil and rubber content. The oil content protects the wood against the rigours of winter weather and summer sunshine.

iii) Resistant to rotting and to the effects of hot sun, rain, frost or snow, making it most suitable for outside.

ECONOMIC USES

i) It is one of the best timbers for furniture, cabinet-work, wagons and railways carriages.

ii) It is popular in marine construction, particularly for decking of boats and ships as the wood has better ability to retain shape.

iii) It is highly prized for poles, beams, trusses, columns, roofs, doors, window frames, flooring planking and other constructional work.

iv) Teak is also used for sound boards of musical instruments and different grades of plywood.

v) As the wood is resistant to chemicals, it is used for shipping corrosive liquids for making laboratory bench-tops and for storing vegetables oils.

vi) Wood-waste of Teak is used for chip-boards, fibre boards and plastic boards.

vii) An oily product obtained by distillation of wood chips is used in the treatment of eczema.

viii) The flowers are used in bronchitis and urinary dicharges.

ix) The root bark is used for colouring matting.

SERPENTINE (SARPAGANDHA)

Common name : Chandrabhaga \ Sarpagandha

Botanical name : *Rauvolfia serpentina*

Family : Apocynaceae

Sarpagandha is located in almost all the hostels of our campus and staff quarters.

BOTANICAL CHARACTERISTICS

i) Sarpagandha is a perennial undershrub upto 50 cm high.

ii) The roots are tuberous with a characteristics wrinkled & coarse surface.

iii) The root bark is greyish yellow to brown in colour with irregular longitudinal fissures.

iv) The long elliptic or obovate leaves occur in whorls of 3-5 at the nodes of short terete stem.

v) The white or pink flowers are arranged in corymbose inflorescence.

vi) The fruit is a purplish black single or didymous drupe.

CHEMICAL COMPOSITION

i) The pharmacuetical activity of sarpagandha is due to the presence several alkaloids of which "reserpine" [C33H40N2O9] is the most potent.

ii) Other important alkaloids present are Serpentine, Serpentinine, Reserpinine, Rauvolfinine, Deserpidine, Ajmalicine, Ajmaline and Isoaimaline.

ECONOMIC USES

i) The drugs obtained from Sarpagandha roots lower the blood-pressure and hypertension.

ii) It plays vital role in mental [nervous] disorders such as anxiety states, excitement hypertension insomnia, nervousness etc.

iii) Decoction of roots is very useful in certain gynaecological conditions such as menstrual uterine contraction and is also used in cases of difficult child-birth.

iv) The root is bitter in taste, narcotic and given as antidotes to the bites of poisonous reptiles and stings of insects.

v) Leaf extract is employed as a cure for opacity of cornea.

vi) Reserpine is effective remidine for nervous breakdown and violent i.

POMEGRANATE

Common name : Pomegranate

Botanical name : Punicagranatum

Family : Lythraceae

Pomegranate is present in the hostels no-1 of our campus .

BOTANICAL CHARACTERISTICS

i) The pomegranate, is a fruit bearing deciduousshrubor small tree growing between five and eight meters tall.

ii) The ediblefruitis a balausta and is between a lemon and a grapefruitin size, 5-12 cm in diameter and has thick reddish skin.

iii) The flowers are bright red, 3 cm in diameter, with four to five petals. The exact number of seeds in a pomegranate can vary from 200 to about 1400 seeds.

iv) The seeds are embedded in a white, spongy,astringentpulp.

CHEMICAL COMPOSITION

The most abundant polyphenols in pomegranate juice are the hydrolyzable tannins called ellagitannins formed when ellagic acid binds with a carbohydrate. Pomegranate ellagitannins, also called punicalagins, are tannins with free-radical scavenging properties in laboratory experiments and with potential human effects.

ECONOMIC USE

i) It is used as fruit.

ii) The entire seed is consumed raw, though the watery, tasty aril is the desired part.

iii) Grenadine syrup is thickened and sweetened pomegranate juice used in cocktail mixing.

iv) Pomegranate is also made into a liqueur and popular fruitconfectionery used as icecream topping or mixed with yogurt or spread asjam on toast.

v) Pomegranate juice (of specific fruit strains) is also used as eye drops as it is believed to slow the development of cataracts.

vi) pomegranate tree bark is used as a traditional remedy against diarrhea, dysentery and intestinal parasites

vii) The flower yield red dye and are also used in bronchitis.

viii) A decoction of the bark is used to expel tapeworm.

ix) The dried seeds, known as anar dana, are used as a flavouring substances.

BEL(WOOD APPLE)

Common name: Bel

Botanical name : Aegle marmelos

Family : Rutaceae

Bel is present in almost all the hostels of our campus and near the canteen.

BOTANICAL CHARACTERS

i) It is midsized, slender, aromatic, armed gum bearing tree growing up to 18 meter tall.

ii) It occurs in dry forests on hills and plains of northern, central and southern India.

iii) The trees bear strong spines; alternate, compound leaves, each with three leaflets; and panicles of sweet-scented white flowers.

iv) The tree is valued for its fruit, which is oblong to pyriform in shape and 50-250 mm (2-10 inches) in diameter.

v) The bale fruit has a smooth, woody, shell with a green, grey, or yellow peel.The fruit has a gray or yellow rind and a sweet, thick, orange-coloured pulp.

CHEMICAL COMPOSITION

Main chemical components are marmelosin, alloimperatorin, marmelide, tannic acid, marmin, umbelliferone, isoimperatorin, isopimpinellin, skimmin, marmesin, marmesinin, fatty acids, beta-sitosterol.

ECONOMIC USES

i) The fruit is eaten fresh or dried. The ripe fruit is sweet, aromatic, and cooling.

ii) The leaves and small shoots are eaten as salad. . Bel leaves contain tannin, which reduces inflammation.

iii) The fragrant leaves are used for medicinal purposes. Leaves of Bel fruit tree help avoid repeated colds and related respiratory conditions. They also help in curing sore throat. Wood apple is also effective in treating chronic cough.

iv) The trunk and branches of bell trees have a gum called 'Feronia gum'. They are used for curing diarrhea and dysentery. The 'Feronia gum', contained in the trunk and branches of the tree, counteracts diabetes by reducing the severity of the condition.

v) Refreshing drinks can also be made from fruit.

vi) Bel fruit is good for digestion. It helps to destroy worms in the intestine. Bel juice is a good remedy for digestive disorders. It is also recommended as a remedy for chronic dysentery. Bel fruit is recommended for people with peptic ulcer or piles. The laxative property of wood apple helps to avoid constipation.

vii) Regular consumption of wood apple is recommended for people with kidney complaints. A good source of beta-carotene, wood apples also cure liver problems. They also contain thiamine and riboflavin. This fruit is an ingredient in cardiac tonic also.

viii) 50 mg. of the juice of bel fruit mixed with warm water and sugar is recommended for blood purification.

ix) The unripe fruit, sliced and sun dried, is traditionally used as a remedy for dysentery

x) It is also used in Ayurveda. In Ayurveda treatment, all parts of the wood apple plant are used to cure snakebites.

CONCLUSION

We came to conclusion that although most of the plants are useful to us, some of them are most essential for our life, virtually we are totally dependent on the plants and its products. We use them as per our needs, but if we know about their actual contents, chemical composition, usefulness, then their use is more beneficial to mankind. There is a myth that eating guava during cough and cold increases the severity of the disease. Actually fact is that the guava is the richest source of vitamin c, so its intake cures cough and cold. Regular consumption of wood apple (Bel) is recommended for people with kidney complaints and liver problems. Very few people knows that the root of sarpgandha is narcotic and given as antidotes to the bites of poisonous reptiles and stings of insects. Teak wood is resistant to rotting and to the effects of hot sun, rain, frost or snow, making it most suitable for outside. We all know about the fruit quality of jamun, but even seed powder of jamun is also used for controlling blood sugar and digestive disorders.. The fresh juice of Aloe- vera leaves are used in liver and spleen ailments and for eye -troubles. Tulsi is used for cough and various respiratory disorders. The leaf juice is given in chronic fever, haemorrhage, dysentery and dyspepsia, catarrh and bronchitis.

Therefore, after completion of this project, we all, now very well know our useful plants found on college campus.

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BOTANY

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COMPARATIVE STUDY OF CHLOROPLAST PIGMENT SEPARATION BY PAPER CHROMATOGRAPHY METHOD OF DICOT AND MONOCOT LEAF

Papiya Ganguly * Roma * Surendra Kumar Prasad *

ABSTRACT : *It is known, that chloroplast occur universally in all autotrophs including angiosperms. This green plastid contains mainly four kinds of pigments.Chlorophyll a (bluish green), Chlorophyll b (dark green), crotene (orange yellow), Xanthophylls (yellow). During this study separation of pigments of Dicot and Monocot leaf and their R.F. (resultant force) value are calculated.*

KEY WORDS : Autotrophs, Angiosperm, Plastid, Chlorophy, Dicot, Monocot

INTRODUCTION

The chromatography may be defined as a technique for separating components in a mixture and identifying them. The technique exploits the differences in the partitioning behaviour of analytes between the stationary phase and the mobile phase. The components of the mixture may be interacting with the ststionary phase based on charges, Van-der-Waals force, relative solubility or adsorption.

All chromatographic systems consist of a stationery phase (solid, liquid, gel, etc.) which is immobilized and a mobile phase (liquid or gas) which runs through the stationary phase. The components of the analyte are separated as a result of phair interaction with the stationary and mobile phases. Several types of chromatographic procedures have been recoganized on the basis of this interaction:

i) Adsorption chromatography
ii) Partition chromatography
iii) Ion-exchange chromatography
iv) Affinity chromatography
v) Gel-filtration chromatography

METHODOLOGY

Requirements : Mortar and pastel. Measuring cylinder, hook fitted in a rubber cork , petroleum ether, methyl, alcohol, monocot and dicot leaves, paper chromatography.

Procedure : The following procedure of paper chromatography is described with reference to the separation of amino acids. The procedure for all

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other molecules, remains the same except the extraction solvent, the mobile phase and the location reagent.

SAMPLE PREPARATION

A suitable solvent is needed which may ensure good solubility of the molecules to be extracted. Usually water miscible solvents are preferred. Some specific treatments may also be needed to separate the molecules in conjugated forms. Ethanol is the best solvent for amino acids separation. In paper chromatography, paper itself functions as the matrix material. It is made cellulose fibre which is a polymer of glucose. The polymer chain has-OH groups attached to all around it. The spaces between these fibres make fine capillaries which play important role in the movement of the mobile phase.

LOADING THE SAMPLE

About 2-3 cm above the lower end of the paper strip a point is marked where the sample is spotted with the helps of a capillary tube or micro pipette. It is air dried and a little more sample is added to the same spot. Care should be taken that the spot remains and concentrated to get best result. Three to five repeated loading may sufficient.

SETTING THE APPARATUS

Take a rectangular jar pour into it 50-100 ml of the mobile phase. This be a single or a mixture of several solvents. The composition may vary for different solutes (samples). For amino acids the best mixture is Butanol: Acetic acid: Water 60:15:25 (V/V). This makes the mobile phase. The paper with the sample spot on it, is placed into this jar such that the lower end of the paper is just immersed in the solvent (Butanol: Acetic acid: Water) Care should taken that the sample spot, in any case remains above the solvent level and never touches it. The paper strip is suspended with the helps of a string and the jar is covered front has risen to 10cm or more. It is now taken out and the solvent front is marked with a pencil (the paper should not be touched by hand) Air dry it to remove superficial solvent.

LOCATION OF SPOTS

Colored molecules can be directly spotted by their color. For other the colour has to be developed using a suitable location reagents (ninhydrin for amino acids and proteins, ammoniacal silver nitrate for sugar etc).

For amino acids, the strip is dipped in 1% solution of nihydrin (1%w/v in isopropanol). It could also be sprayed with an atomize. The paper strip is dried and heated in oven at 1100 C. Purple colour sports may be observed after one hour. Sometime it may take several hours to develop. All sport are purple except that of proline which is yellow.

CALCULATION OF RF VALUES

Rf value in paper chromatography can be calculated as the ratio of the solute front to the solvent front.

Thus, $$RF = \frac{\text{Distance travelled by solute}}{\text{Distance travelled by solvent}}$$

RESULT

Calculation of RF value

$$RF = \frac{\text{Distance travelled by pigment}}{\text{Distance travelled by solvent}}$$

MONOCOT LEAF

$$\text{Chlorpphyll a} = \frac{AB}{AE} = \frac{3.5}{15.7}\ \text{cm}$$

$$\text{Chlorpphyll b} = \frac{AC}{AE} = \frac{7.7}{15.7}\ \text{cm}$$

$$\text{Xanthophyll} = \frac{AD}{AE} = \frac{15.2}{15.7}\ \text{cm}$$

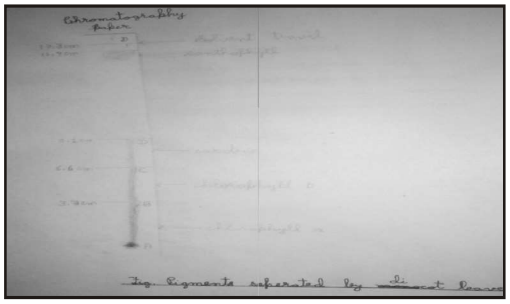
DICOT LEAF

$$\text{Chlorpphyll a} = \frac{AB}{AF} = \frac{3.7}{17.3}\ \text{cm}$$

Chlorpphyll b = $\frac{AC}{AF} = \frac{6.6}{17.3}$ cm

Carotene = $\frac{AD}{AF} = \frac{9.1}{17.3}$ cm

Xanthophylls = $\frac{AE}{AF} = \frac{16.7}{17.3}$ cm



RESULT ANALYSIS

During study, comparative study of chloroplast pigment of dicot & monocot leaf, several band of pigment separation occurs : In dicot leaves, more bands of pigment separate in comparison to monocot leaf.

PRECAUTION

The based edge of the paper must be in touch wrath the solvent mixture contained in the cylinder.

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STUDY OF CLODINAFOP PROPARGYAL ON INDIAN CROPPED WHEAT USING HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

Sulakshana * Sweta * Basabi Mahapatra *

ABSTRACT : *Residues of Clodinafop Propargyl, herbicide commonly used for the control of grassy weeds in cereals mainly wheat, have been determined in two samples of wheat (Lokmanya and pbw-154) by high performance liquid chromatography with UV detection at 254 nm. Based on the HPLC results, it is clear that clodinafop propargyl residue is present in wheat and its level is also found. The hazardous effects of clodinafop propargyl on health of living being are well known. Clodinafop propargyl in wheat samples is identified by comparing the peak areas of the samples with corresponding peak for standards.*

KEY WORDS : Clodinafop Propargyl, Wheat, HPLC.

INTRODUCTION

BACKGROUND OF THE STUDY

"Give us this day our daily bread" is an eternal prayer. Bread made from wheat (Triticum aestivum) has from ancient times, been referred to as stuff of life. Wheat is counted among the 'big three' cereal crops, with over 600 million tones being harvested annually. For example, in 2007, the total world harvest was about 607 m tones compared with 652 m tones of rice and 785 m tones of maize. However, wheat is unrivalled in its range of cultivation, from 670 N in Scandinavia and Russia to 450 S in Argentina, including elevated regions in the tropics and sub-tropics. It is also unrivalled in its range of diversity and the extent to which it has become embedded in the culture and even the religion of diverse societies.

Many varieties of wheat are grown in different states of India. For example **UP-2338, PBW-154, PBW-621, DBW-17, GUJ (LOKMANYA), HUW-234** etc. Usually spring wheat is grown in India. Wheat is used in making bread, pasta, noodles and other food products. Wheat also contributes essential amino acids, minerals and vitamins and beneficial photochemical and dietary fiber components to the human diet and these are particularly enriched in whole-grain products. However, wheat products are also known or suggested to be responsible for a number of adverse reactions in humans, including intolerances (notably celiac disease) and allergies (respiratory and food).

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There are many variables that influence the chemical composition of wheat, such as methods of cultivation, fertilizers and pesticides used water for irrigation or storage and commercialization conditions.

Herbicides are the systemic pesticides, widely used in agriculture for pre and post harvest treatment for the control of a wide range of crops pathogens. But over use or misuse of these pesticides lead to many health hazards. So it is need to find the cause of these health hazards and identify the misuse and effect of pesticides on the crops.

In present study, a chromatographic methodology was used to identify the pesticide residue in different wheat samples cropped in India. Two wheat samples were collected from Punjab and Gujarat' market and were analyzed in our laboratory. The simultaneous determination of clodinafop propargyl residue was carried out by HPLC analysis.

OBJECTIVES OF THE STUDY

The following objectives were proposed for achievement in this study:

i) To find out the presence of clodinafop propargyl residue in wheat.

ii) To find out the level of clodinafop propargyl residue in wheat.

iii) To find out the effect of clodinafop propargyl residue on wheat.

SIGNIFICANCE OF THE STUDY

Whenever effort, time and money are spent on a study, it is expected that in return the results of the study would have a bearing on the mankind in some way or the other. Keeping with this it is important to state the significance of the present study as well. The significance has been enumerated as below:

(i) The study has quantified the clodinafop propargyl presence and its level in wheat.

(ii) It helps to understand the hazardous effect of clodinafop propargyl on wheat.

(iii) The study also alerts about the health hazards which caused by this pesticide and direct us limited use of the pesticide on the crops.

METHODOLOGY OF THE STUDY

The present study entitled 'Study of Clodinafop Propargyl on Indian cropped wheat using High Performance Liquid Chromatography' was conduced under the standard guidelines of scientific study. To achieve the objectives of the present study that was basically an experiment and an appropriate methodology was planned. This chapter gives an account of the method and procedure in detail, which were followed to carry out this investigation.

SAMPLE OF THE STUDY

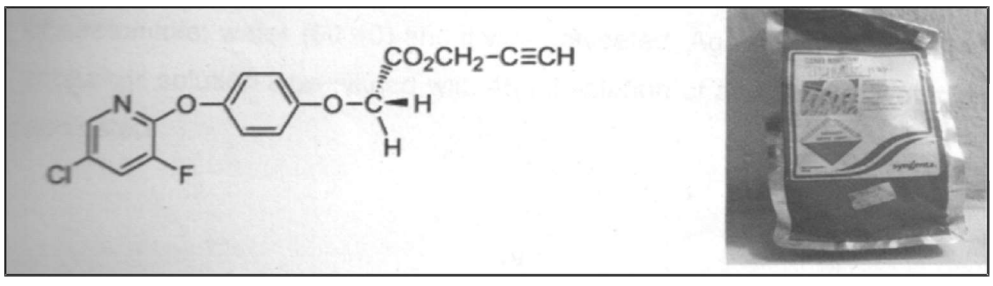
Samples of wheat were collected from market. A total of two varieties of wheat sample (PBW-154 and Gujrat-Lokmanya) were collected for analysis.

REAGENTS

Acetonitrile (HPLC grade) Water (HPLC grade), chloroform (HPLC grade) distilled water and Clodinafop propargyl pesticide reference standard (98% of purity)

STRUCTURAL FORMULA: Clodinafop propargyl

Chemical Name: Propyny (R)-2-[4-[5-chloro-3-fluoro-2-pyridinyl)oxy]



METHOD OF THE STUDY

HPLC : High Performance Liquid Chromatography or High Pressure Liquid Chromatography composed of a monopiston pump (model flexar -6), a manometric module (model flexar-6), a Rheodyne Inc model flexar-6 injector fitted with 20µl loop of a variable wavelength ultraviolet detector (model flexar-6) and a stainless steel column (250 x 4.6 mm i.d.) packed with 5µm Ultrasphere ODS. The chromatograms were recorded using a computing integrator (L.C.I. 100). A rotator evaporator (vv micro), a sorvall omni-mixer, a magnetic stirrer, a Buchner vacuum filtration. A pyrex column with Teflon taps (30 x 1 cm i.d.), Whatman no. 3 filter papers.

SAMPLE PREPARATION

50 grams of wheat samples were crushed to make it flour and transferred into a conical flask containing 100 ml acetonitrile (HPLC grade) and next the mixtures were homogenized by a simple agitation during 5 minutes and the mixture were left for a overnight. The solvent was decanted on Buchner funnel under suction using a Whatman no. 3 filter paper and glass wool. The conical flask was washed with acetonitrile. The filtrate was heated on a water bath to concentrate the solution. 10 ml of concentrated sample solution was used for analysis.

0.335 grams of Clodinafop propargyl was mixed in a 50 ml solution of acetonitile: water (60:40) and it was sonicated. Again 5 ml of clodinafop propargyl solution was diluted with 45 ml solution of acetonitrile: water and sonicated.

HPLC ANALYSIS

High Performance Liquid Chromatography having UV/Visible detector used for identification and quantification of pesticide. Samples were injected manually through a Rheodyne injector. Detector was connected though the computer for data processing. The working condition of HPLC was binary gradient. A suitable volume (10µl) of the extract was injected into the column and eluted with a mobile phase acetonitrile: water (180:120) at a flow rate 1 ml/min. An absorption wavelength of the UV/Visible detector was fixed at 254 nm for the residual analysis of clodinafop propargyl.

RESULTS AND DISCUSSION

By HPLC method for the identification of pesticide residue and its standards. We come to know that, the pesticide residue is present in the two wheat samples and the pesticide residue present in the wheat samples was identified and quantified with reference to standard pesticide. The calculation of amount of pesticide present was carried out by comparing the peak areas for unknown samples with corresponding peak for standards, according to established procedures.

The presence of pesticide residue has an hazardous effect on the living beings (plants, animals and humans) and environment. First of all the pesticide badly affect the crops and plants. This destroys the quality of the crops and also productivity of the soil. In animals and humans it causes vomiting, diarrhea, slow heart rate, anemia, skin irritation, eye irritation, endocrine damage and cancer humans. For example, it causes prostate cancer in mice and ovarian cancer in female rats.

CONCLUSION

In this study the HPLC method used to determine clodinafop propargyl in wheat samples in less time and with low detection limit. The results of our monitoring indicate that two samples of wheat that were examined, both samples contained clodinafop propargyl residue. In addition, the obtained results clearly indicate the level of presence of clodinafop propargyl and the actual situation of the misuse of clodinafop propargyl which may affect in turn at long period the consumers health.

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QUALITATIVE AND QUANTITATIVE ANALYSIS OF DRINKING WATER IN CERTAIN AREAS OF PATNA

Divya Sinha * Rakhi Kumari * Basabi Mahapatra *

ABSTRACT : *The physicochemical parameters of water samples collected from various sites in and around Patna were analysed. The physicochemical parameter like, temperature, total dissolved solids, Total hardness, Calcium, Magnesium, Chlorine, Fluoride were determined. The results were compared with standards prescribed by WHO and ISI (10500 - 91). It was found that the water samples collected from various samples collected from various sites in and around Patna was contaminated.*

KEYWORDS: Surface Water, Physico-Chemical Parameter.

INTRODUCTION

Quality of drinking water in Patna with a view to determine the extent of its deterioration has been looked into. Attempts have also been made to find the best source of drinkingwater available to the people.Some samples were collected from different areas of Patna. The collected samples were analysed on a total of physical and chemical parameters. The degree of deterioration in quality of drinking water of the collected samples were compared with the permissible limits of world health organization (WHO) and Indian Standard Institute (ISI).The various analysis revealed that physical and chemical parameters were well within the permissible limits of WHO and ISI to some extent.

The present study also suggest that deeper aquifers which commonly are used for drinking water supplies are relatively free from contamination.

Ground water is used for domestic, agricultural and industrial purposes in most parts of the world. The major source of water are rainfall,surface water involving rivers,lakes and ground water involving wells and bore wells etc. But ground water is the only alternative option for drinking or cooking purposes even in the urban centres having well-planned,designed and properly exacted water supply system. The ground water potential and its quality level in major cities and urban centres is getting deteriorated due to the population explosion,urbanization, industrialization on the failure of the monsoon and improper management of rain water.

The ground water quality normally characterised by different physiochemical characteristics. These parameters change widely due to the various type of pollutant. Fertilizers and pesticides from

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agricultural discharge,highly degradable organic material from detergents,industrial effluents,various viruses and bacteria from sewage domestic waste are the major pollutants.These pollutants are added to the ground water through leakage from gasoline storage tanks,improperly designed, located and maintained septic tanks, seepage from municipal wastes, etc.

OBJECTIVES

The content of the environment interact with one another and produce the favourable impact on the health of the people. Besides this it also affect the ecological balance by harming the other organisms. The main objective of the proposed work are :

- To know the present scenario of Patna regarding drinking water quality
- To establish the relationship between water quality and its effect on food chain
- To know the "philosophy of geology" in fluoride ion contamination in ground water
- To give a clue or pathway for the prediction of assessment of water quality in ground water

WATER QUALITY PARAMETERS

pH:

pH (Potentia hydrogenii) is the measure of the intensity of acidity and alkalinity and measure of the concentration of hydrogen ions in water. In fact, the normal acidity alkalinity depends upon excess of H^+ or OH^- ions over the other and measured in normality or gram equivalents of acid and alkali.If free H^+ is more than OH^- ions, the water shall be acidic or alkaline the other way round. pH is generally measured on a log scale and equals to negative log10 of hydrogen ion concentration.

$$pH = -\log10[H^+]$$

As the ionic product of water is 1×10^{14} at 25°c therefore, a neutral solution will have 1×10^7 ion of H^+ and OH^- each. pH scale ranges from 0 to 14 with 7as neutral, below 7 being acid and above as alkaline.

TEMPERATURE

It is one of the most important parameters for aquatic environment because almost all the physical, chemical and biological properties are governed by it. For example,density viscosity, surface tension and vapour pressure of water, more or less depend on the temperature profile of the system.It is the temperature which limits the saturation values of solids and gases that are dissolved in it.The rate of chemical reactions and other biological activity such as corrosion or incrustation, BOD, photosynthesis, growth and health of micro organisms are all dependent upon environmental temperature values. Indian climate provides almost an idea range of solar temperature which attributes great self purification strength in the stream. The rate of biochemical reaction is directly proportional to the environmental temperature. In hottest months, the oxygen demand increases,leading to serious oxygen depletion problem in the systems concerned.

CONDUCTIVITY

Conductivity is the measure of capacity of a substance or solution to conduct electric current.As most of the salts in the water are present in the ionic forms, capable of conducting current therefore, conductivity is a good and rapid measure of the total dissolved solids.

TOTAL DISSOLVED SOLIDS

TDS denotes mainly the various kinds of minerals present in the water.In natural waters, dissolved solids are composed mainly of carbonates,

bicarbonates, chloride, sulphate, phosphates and nitrates of calcium, magnesium, sodium, potassium, iron and manganese, etc.

HARDNESS

Hardness is the property of water which prevents the lather formation with soap and increases the boiling point of water. Principal cations imparting hardness are calcium and magnesium. However other cations such as strontium,iron and manganese also contribute to the hardness. The anions responsible for hardness are mainly bicarbonates, carbonates,sulphates, nitrate, chlorides, etc. Hardness is called temporary if it is caused by bicarbonates and carbonates salts of cations, since it can be removed simply by boiling the water. Permanent hardness is caused mainly by sulphates and chlorides of the metals.

CALCIUM

Being present in high quantities in the rocks, it is leached from there to contaminate water. It has got a high affinity to absorb on the soil particles, therefore the cation exchange equilibria and presence of the other cations greatly influence its concentration in water. Concentration of the calcium is reduced at higher pH due to its precipitation as $CaCO_3$. Disposal of sewage and industrial waste are also important sources of calcium.

IRON

Iron is one of the most abundant element of the rocks and soils, ranking fourth by weight. Iron has more solubility at acidic pH. Iron occurs in two valance forms - iron (II), ferrous and iron (III), ferric.Reduced iron is generally more soluble than oxidized iron. In ground water most of iron remains in ferrous state due to general lack of oxygen.

FLUORIDE

Fluorides occur naturally in water. Fluorides are soluble in water. These are quite widely spread in nature in earth crust as well as below it. Consequently, these become available in ground water. Fluoride concentration is more in ground water than that in the surface water of the same geographical region.Other sources of fluorides are tea rock salt and food grains like sorghum, ragi, bajra,etc. in addition to certain industrial discharges.

EFFECT OF WATER QUALITY PARAMETERS ON HEALTH

Water pollution adversely change the quality of water. It disturbs the balance of eco systems and it causes health hazards to human and animals. Water becomes polluted by the presence or addition of inorganic or biological substance. Contamination is caused by the effluents from factories, pipemills, sugar mills, tanneries, urban and rural sewage are let into rivers. Industrial effluents cause water pollution because of the toxic materials which they introduced into water. Water pollution also occurs due to use of pesticides and fertilizers in agriculture.Oil spills from oil tankers also cause marine pollution.

Chemical /physical parameters include heavy metals trace organic compounds, total suspended solids (TSS) and turbidity. Microbiological parameters include coliform bacteria,E. coli and species of bacteria (such as cholera -causing vibrio cholerae) viruses and protozoan parasites. Throughout most of the world, the most common contamination of raw water sources is from human sewage and in particular human faecal pathogens and parasites. It is clear that people in the developing world need to have access to good quality water in sufficient quantity, water purification technology and availability and distribution systems for water. In many parts of the world the only sources of water are from small streams often directly contaminated by sewage.

The levels of contaminants in drinking water are seldom high enough to cause acute health

effects. Examples of acute health effects are nausea, lung irritation, skin rash, vomiting, dizziness and even death. Contaminants are more likely to cause chronic health effects that occur long after repeated exposure to same amount of chemical. Examples of chronic health effects include cancer, liver and kidney damage,disorders of the immune system and birth defects.

Contamination of water by sewage and industrial effluents is a threat to drinking water and its use in swimming, boating and fishing. Industrial effluents are toxic to fish,man and plants and other micro-organisms. The use of insecticides and pesticides at home and in farms, although effective in killing insects, is partly poisonous to man. Enrichment of water by nutrient (especially phosphate & nitrates)results in eutrophication of lakes and water bodies. This results in excessive growth of harmful blue green algae and depletion of dissolved oxygen present in the lake. The harmful bacteria of polluted water cause many dangerous diseases such as cholera, typhoid, dysentery, etc. Various harmful chemicals like DDT can enter into the food chain through polluted water and continuously its concentration increases in successive tropic levels in a food chain. This phenomenon is known as biological magnification. Besides DDT,there are also heavy metals like lead,mercury,copper which also show similar behaviour in food chain.

FLUORIDE

Long term consumption cause dental fluorosis,endemic cumulative fluorosis with resultant skeletal damage in both children and adults. Fluorides are mainly deposited on bones,teeth and further on skeleton and later in soft tissues. Over dose of fluorides causes mottling of enamels and bones.The disease is characterised by hyper-mineralization of skeleton,calcification of ligaments, painful joints leading to immobilization. Fluorides in high doses can also cause respiratory failure and paralysis.Large amount of fluoride in a short period of the time may cause symptoms like abdominal pain,diarrhea,dysphasia hyper salivation, mucasal injury, vomiting, neurological symptoms include headache, muscle weakness.

IRON

Iron in the high concentration causevomiting. Iron in excess of 0.3mg/litre causes staining of clothes and utensils.Water with higher concentration of iron is also not suitable for processing of food beverages,ice, dyeing,bleaching and many other items. Potatoes turn black on boiling when concentration of iron is the more than 1.0mg/ litre.

HARDNESS

Hardness in water leads to heart diseases, kidney stone formation, etc. and makes water unfit for drinking, washing, cleaning etc. However in certain conditions it forms a thin layer of scale thus preventing corrosion in pipes hence reduces the hardness of heavy metals from the pipe to the water environmental toxicology.

CALCIUM

Calcium is dietary requirement for all organism apart from some insects and bacteria. Calcium is largely responsible for water hardness, and may negatively influence toxicity of other compounds. Calcium is a dietary mineral that is present in the human body in amounts of about 1.2 kg. No other element is more abundant in the body. Calcium phosphate is a supporting substance and it cause bone and tooth growth, together with vitamin D. calcium is also present in muscle tissue and in the blood. It is required for cell membrane development and cell division and it is partially responsible for muscle contractions and blood clotting. Calcium regulates membrane activity, it assists nerve impulse transfer and hormone release, stabilizes the pH of the body and is an essential part of conception when

we take up large amount of calcium this may negatively influence human health. Metallic calcium corrodes the skin when it comes in contact with skin, eyes and mucous membranes.

CHLORINE

Chlorine has been used as an effective disinfectant in drinking water supplies for nearly 100 years. Chlorine is considered necessary to destroy many of the bacteria in our drinking water. Risk for certain types of cancer are now being correlated to the consumption of chlorinated drinking water.

TDS

TDS in water supplies originate from natural sources, sewage, urban and agricultural run off and industrial waste water. Salt used for road de-icing can also contribute to the TDS loading of water supplies. In early studies inverse relationships were reported between TDS concentration in drinking water and the incidence of cancer coronary heart disease etc.

pH

pH level is an indicator of the acid or alkaline condition of water. The pH value of water determines whether the water is hard or soft. The pH of drinking water is not a health concern but acidic water which have a low pH rating can leach some metals from plumbing systems, causing health problems.

STUDY AREA

The authors has undertaken the present project work in Patna town. It is the capital of State of Bihar. It is situated at Latitude - 25.240 N and Longitude 84.250E. The average rainfall here is 45 cm.

The climate of Patna is comprised of distinct summer, rainy and winter season.

Following are the important locations in Patna chosen by authors for their analysis work :

i) Gandhi Maidan
ii) Rajendra Nager
iii) Digha
iv) Gola Road
v) Patel Nager
vi) Boring Road
vii) Jagdev Path
viii) Danapur Cantt
ix) Nala Road

METHODOLOGY

CALCIUM

i) 1ml of pre-treated sample was taken in a beaker than 1ml reagent of calcium was added mixed. It was taken in a cell and was left for exactly 3 minute.
ii) Then again 0.50ml reagent of calcium was added with help of pipette and then closed and it was then mixed completely.
iii) The sample was measured in the photometer.

FLOURIDE

i) 2.0ml Reagent F-1 was pipetted into a test tube.
ii) 5.0ml per treated sample was added with pipette and it was mixed.
iii) 1level blue micro spoon reagent F-2 was then again added to the sample and was shacked vigorously unit the reagent was completely dissolved.
iv) The sample was left for 5 minutes then filled the sample into a 10 minute cell and measured in the photometer.

CHLORINE

In weakly acidicsolution free chlorine reacts with dipropyl P -phenylenediamine (DPD) to form a red violet dye that is determined photometrically.

i) Pre-treated sample reagent CL-1 taken and 5.0ML 1Level blue micro spoon in the cap of the CL-1 bottle pipette in a clean round cell was taken.

ii) The cell was closed and shaked vigorously until the reagent was completely dissolved.

iii) It was left for 11minutes and then the sample was measured in the photometer.

TDS

i) 50 mlwater was taken in a beaker and then TDS machine was dipped in a beaker.

ii) The reading was seen on TDS machine and then noted.

TEMPERATURE

i) Water was taken in a beaker and then the temperature rod was dipped in a beaker.

ii) The reading was measured on the micro controller solution analyser kit.

IRON

i) Pre-treated sample 5.0 ml was pipetted into a test tube then reagent Fe-1 of 3 drops was added and mixed properly.

ii) Then it was left to stand for 3 minutes then the sample was filled into the cell and it was measured in the photomet.

SAMPLING LOCATIONS IN PATNA

S.NO	SAMPLE LOCATIONS	SOURCE	SAMPLE NO.
1	Gandhi Maidan	Tap water	S1
2	RajendraNager	Tap water	S2
3	Digha	Boring	S3
4	Gola Road	Boring	S4
5	Patel Nager	Boring	S5
6	Boring Road	Boring	S6
7	Jagdev Path	Boring	S7
8	DanapurCantt	Boring	S8
9	Nala Road	Boring	S9

AVERAGE RESULTS OF THE PARAMETERS OF DIFFERENT PLACE IN PATNA.

Parameter	WHO	ISI	S1	S2	S3	S4	S5	S6	S7	S8	S9
Temperature (^{o}C)	_	_	33.5	32	31.6	30.3	31.6	31.1	30.7	30.8	30.5
Iron (mg/l)	_	_	0.20	0.08	0.73	0.16	0.62	0.19	0.46	0.92	0.06
TDS (ppm)	1000	500	300	340	320	330	390	320	380	420	560
Chlorine (mg/l)	250	250	0.09	0.10	0.09	0.04	0.11	0.14	0.08	0.05	<0.03
Fluoride (mg/l)	1.5	_	0.2	1.3	0.6	0.3	1.7	<1.0	<1.0	<1.0	1.5
Calcium (mg/l)	100	75	63	54	55	46	70	20	66	62	86
Hardness (mg/l)	500	500	10.6	11.6	11.6	9.9	12.1	9.6	12.1	12.4	5.0
pH			6.5	7.0	6.5	7.8	7.9	7.11	8.0	7.9	7.10

RESULTS AND DISCUSSION

The different physicochemical parameters of water samples from the above areas can be calculated and were compared with standards prescribed by WHO. It is described as below :

i) **Temperature (T) in ºC.** : Temperature is an important biologically significant factor, which plays an important role in metabolic activities of the organism. The temperature was ranging from 30.5ºC to 33.5ºC during the study period. Lowest

water temperature was observed in the areas S-4, S-7, S-8 and S-9 was 30.3ºC, 30.7ºC, 30.8ºC and 30.5ºC respectively an increase in temperature was observed in the areas S1 and S2 was 33.5ºC and 32ºC respectively.

ii) **Calcium (Ca^{2+}) in mg/litre** : Calcium is directly related to hardness. Calcium concentration ranged between 20 mg/l to 75 mg/l. This value of calcium was almost found to be within the permissible limit of WHO and ISI.

iii) **Hardness in (mg/litre)** : Hardness is the property of water which prevents the lather formation with soap increases the boiling points of water. Hardness of water mainly depends upon the amount of calcium or magnesium salts of both. The hardness values shown ranges from point 5.0 mg/ litre to 12.4 mg/litre within the permissible value of given by WHO and ISI.

iv) **pH** : pH is a term used universally to express the intensity of the acid or alkaline condition of solution. Most of the water samples are slightly alkaline due to presence of carbonates and bicarbonates. The pH values of water samples varied between 6.5 to 8.0 and were found and higher range of pH indicates higher productivity of water.

v) **Total dissolved solids (TDS) in ppm** : Total dissolved solids indicate the salinity behaviour of groundwater. Water containing more than 500 mg/litre of TDS is not considered desirable for drinking water supplies but in unavoidable cases 1500 mg/l is also allowed. A TDS value varies from 320 ppm to 560 ppm. All the samples showed within TDS values prescribed limit given by WHO and ISI except the sample S9 whose TDS value was 560 ppm above the prescribed value of ISI.

vi) **Fluoride (F-) in mg/litre** : Probable source of high fluoride in Indian waters seems to be that during weathering and circulation of water in rocks and soils, fluorine is leached out and dissolved in ground water. Excess intake of fluoride through drinking water causes fluorosis in human being. In the present analysis, fluoride concentration was found in all samples in different areas of Patna. It ranges between 0.2 mg/l to 1.7 mg/l. It is found that S-5 has higher value of fluoride.

vii) **Chlorine in mg/litre** : In the present analysis, chlorine concentration was found in the range 0.03 mg/l to 0.14/l. The chlorine values in the different samples were found to be much below the prescribed limit given by WHO and ISI.

viii) **Iron in mg/litre** : Iron is one of the most abundant elements of the rocks and soils, ranking fourth by weight. Iron has more solubility at acidic pH. It ranges between 0.06 mg/l to 0.73 mg/l. in the present analysis.

CONCLUSION

Water samples of different places Patna were analysed. The quality water sample no. S9 and S7 were found to be poor with respect to other places. The sample no. S9 show the TDS and calcium value above the prescribed limit of ISI but found to be within the permissible limit given by WHO. All the samples of water S1, S2, S3, S4, S5, S6 and S8 were under the permissible limit of WHO and ISI. The water samples of the area S9 and S7 need to be modified.

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GANGES PURITY : A CHALLENGE FOR SCIENCE

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ABSTRACT : *In our research project a systematic study has been carried out to assess the water quality index of River Ganga in Patna District. The water sample of the bank and the middle were collected during pre- monsoon and monsoon seasonsfrom three sampling stations namely Kali Ghat, Krishna Ghat and Gandhi Ghat and analyzed for physico-chemical parameters (Temp, pH, dissolved oxygen, total hardness, electrical conductivity, total dissolved solids, fluoride, iron , iodine, total chlorine and lead). Each parameter was compared with the standard desirable limit of that parameter in river water as prescribed by different agencies.*

The analytical data of various physicochemical parameters indicates that some parameters like pH of Kali ghat, Gandhi ghat and Krishna ghat for pre-monsoon and during monsoon was approx.(8.11). As we know a pH range of 6.0 to 9.0 is safe for the life of fresh water fish and bottom dwelling invertebrates.

The concentration of fluoride & iron, during pre- monsoon were under permissible range but during monsoon the concentration of fluoride& iron, had increased i.e. these were not under permissible range

Concentrations of fluoride above 1.5 ppm in drinking water causes dental fluorosis and much higher concentration of skeletal fluorosis These observations suggest that use of such water for drinking may lead to potential health risk in the long-run.

KEYWORDS: Water Pollution, Ganga River Water, Physicochemical Analysis.

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INTRODUCTION

The Ganga is a major river of the Indian subcontinent rising in the Himalaya Mountains and flowing about 2,510 km (1,560 mi) generally eastward through a vast plain to the Bay of Bengal. On its 1,560-mi (2,510-km) course, it flows south east through the Indian states of Uttar Pradesh, Bihar, and West Bengal. In central Bangladesh it is joined by the Brahmaputra and Meghna rivers. Their combined waters (called the Padma River) empty into the Bay of Bengal and form a delta 220 mi (354 km) wide, which is shared by India and Bangladesh. Its plain is one of the most fertile and densely populated regions in the world. The Ganges alone drains an area of over a million square km with a population of over 407 million. Millions depend on water from the holy river for

several things: drinking, bathing, agriculture, industry and other household chores. Ganga river known as Ganga Maata or Mother Ganges is revered as a goddess whose purity cleanses the sins of the faithful and aids the dead on their path toward heaven. In most Hindu families, a vial of water from the Ganga is kept in every house. It is believed that drinking water from the Ganga with one's last breath will take the soul to heaven. Hindus also believe life is incomplete without bathing in the Ganga at least once in their lifetime. Some of the most important Hindu festivals and religious congregations are celebrated on the banks of the river Ganga such as the Kumbh Mela or the Kumbh Fair and the Chhat Puja. Kumbh Mela is the largest religious gathering on Earth for Hindu peoples, where around 70 million Hindus from around the world participated in the last Kumbh Mela at the Hindu Holy city Prayaga (also known as Allahabad).

It had wide medicinal uses in local therapy. It has the ability to clean and to assimilate and treat biological waste using sunlight and oxygen. But Ganga gets no time to breathe and revive. Its water is active against various clinical pathogens due to its unique organic and inorganic constituents. Antimicrobial activity which is naturally present in Ganga water is not observed in any other perennial river in the world. Ernst Hankin, a British bacteriologist, reported in 1896 the presence of marked antibacterial activity against vibrio cholera, which he observed in the water of river Ganga and suggested that it might help to decrease the incidence of cholera in people using water from the Ganges. With time and because of increased human intervention, sacred Ganga has become impure. The pristine water of Ganga has been replaced by polluted water. All forms of pollutants including mortal remains of human beings are released into the river. Thus, water of Ganga is overloaded with pollutants.

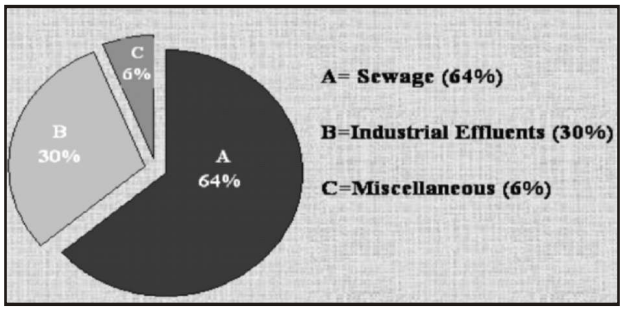
According to CPCB's 2013 report 2,723 million liters per day(mld) of domestic sewage is discharged by cities located along the river.

As a result of this the water in the Ganges has been correlated to contracting dysentery, cholera, hepatitis, as well as severe diarrhoea which continue to be one of the leading causes of death of children in India. The water body is now filled with arsenic, lead, cadmium, fluoride and heavy metals. This has drastically increased the number of cancer cases near the flood plains of Ganga. As per a survey by the NCRG(National Cancer Registry Programme) in Bihar, U.P. and West Bengal, in every 10,000 people 450 men and 1,000 women suffer with gall bladder cancer. India also shows the highest number of prostate cancer cases.

GEOMORPHOLOGY

Salient Features of River Ganga
Total Length =2525 kms
Uttarakhand =450 kms
Uttar Pradesh =1000 kms
Sharing length between UP & Bihar = 110 kms
Bihar =405kms
Jharkhand =40kms
West Bengal =520 kms
Average Annual discharge= 4,93,400 million cubic meter
Main Tributaries =Yamuna, Ramganga, Gomti, Ghaghara, Gandak, Damodar, Kosi & Kali-East.

% OF SOURCES POLLUTING GANGA RIVER



- Effect of Pollution of Ganga on Aquatic and Humans Lifes
- Effect of the pollution in river direct observed in fish. In the GANGA river fish become extinct
- Due to pollution in Ganga the Ganga Dolphin has Population of only 2000 and Is Now an Endangeard Species

- The effect of the pollution increases the organic matter in river water
- Presence of toxic chemical in water has adversely affect the aquatic life
- Impair light penetration due to oil spill
- The effect of water pollution strongly affected the ecological balance, which ultimately impacts all human
- Harms the food chain : Break the link of food chain
- Spread of disease: like cholera ,Typhoid, infection ,diarrhea etc.
- Affect of body organ: The consumption of highly contaminated water can cause injury to the HEART & KIDNEY

OBJECTIVES

The main objective of this research work is:

- To analyses the physico-chemical parameters of Ganga water different ghats of Patna
- To compare the quality of Ganga water of three sampling station
- To compare quality of Ganga water in pre-monsoon and monsoon period

METHODOLOGY

EXPERIMENT : A total of 12 water samples were collected from three different spots of Patna during pre-monsoon and monsoon seasons over a period April - June (2014) and July - September (2014). The samples were taken in plastic jerry canes and brought to the laboratory with necessary precautions. All samples were labelled properly. Water samples were analysed by standard methods The samples were analyzed for following physicochemical parameters:

Water Temperature (ºC), pH, hardness (mg/l), total dissolved solids (mg/l),electrical conductivity (mho/cm), dissolved oxygen (mg/l),fluoride(mg/l), iron (mg/l), iodine(mg/l), total chlorine(mg/l) and lead(mg/l).

REAGENTS USED

i) Fe-reagent -Fe-1

ii) I2-I21

iii) Total chlorine-Cl2-1

iv) Pb-Pb-1 and Pb-2

v) Flouride-F-1 and F-2

WATER QUALITY TEST METHOD

ANALYSIS WERE DONE BY STUDIES OF WATER QUALITY PARAMETERS OF RIVER GANGA AT PATNA, BIHAR.

S.NO.	PARAMETERS	UNITS	TEST METHOD
1	pH		Electric Water and soil analysis kit
2	Temperature	0C	Electric Water and soil analysis kit
3	Conductivity	µs/cm	Electric Water and soil analysis kit
4	DO	Mg/l	Electric Water and soil analysis kit
5	TDS	Mg/l	Pen type Eco Tester TDS Meter
6	Fluoride	Mg/l	Spectroquant NOVA-60
7	Iron	Mg/l	Spectroquant Multy Colorimeter
8	Iodine	Mg/l	Spectroquant Multy Colorimeter
9	Lead	Mg/l	Spectroquant Multy Colorimeter
10	Total Chlorine	Mg/l	Spectroquant Multy Colorimeter

RESULTS AND DISCUSSION

The results obtained from analysis of water samples of river Ganga are shown in table1, 2, & 3. The results indicate that the quality of water varies considerably from pre-monsoon to during monsoon.

i) The conductivity of water is affected by the suspended impurities and also depends upon the amount of ions in the water. The minimum conductivity 0.25µmho/cm(bank) and 0.89µmho/cm(middle) of the Ganga water was observed before monsoon season and highest conductivity 1.56 µmho/cm(bank) and 0.89µmho(middle) of the Ganga water was observed during monsoon season. So the Conductivity of Ganga water is more than the permissible range.

ii) The pH of the Ganga water at Kali-Ghat, Krishna-Ghat, Gandhi-Ghat was alkaline during monsoon and pre-monsoon season.It ranges from 7.5-8.58. The Ganga water consume highest dissolve oxygen (DO) during monsoon season i.e,2.733mg/l(bank) and 3.5mg/l(middle) followed by a gradual decrease before monsoon 0.33mg/l(bank) and 1.16mg/l(middle).

iii) The higher concentration of D.O. During monsoon season was probably due to low water temperature, no-turbidity and increased photosynthetic activity of green algae found on the sub-merge stones and pebbles. So,D.O. is under permissible range, which is (4-5). The TDS of three sampling station was under permissible range during pre-monsoon and monsoon season.

iv) Ganga water in pre-monsoon is maximum i.e., 240 mg/l (bank) and 226.6 mg/l (middle) and it is minimum during monsoon i.e, 163.33 mg/l (Bank) and 163.33 mg/l (middle). Conclusion: TDS is under range.

v) The Ganga water of banks of Gandhi Ghat and Krishna Ghat has highest concentration of fluoride i.e., 1.17 mg/l &> 2.00mg/ respectively. so, it was more than the permissible range.

vi) It was observed that the amount of Iron was maximum during monsoon i.e, 1.18 mg/l (bank) and 0.84 mg/l (middle) and was minimum in pre-monsoon i.e., 0.09 mg/l (Bank) and 0.07 mg/l (middle) . This shows that the amount of Iron during monsoon was more than the permissible range.

vii) Iodine in Ganga water was found to be maximum (bank) 2.47 mg/l iodine and(middle) contains 2.81 mg/l iodine during monsoon . .while in pre-monsoon the amount of iodine in Ganga water was found to be 0.42mg/l at the bank and 0.49mg/l in the middle .Thus the amount of Iodine in Ganga water was under range .

viii) The concentration of lead increases during monsoon i.e., 1.03 mg/l (bank) and 1.10mg/l (middle) and decreases in pre-monsoon i.e., 0.13mg/l (bank) and 0.14mg/l (middle). This indicates that the concentration of lead in Ganga water was under range.

ix) Total chlorine in Ganga water was found to be maximum during monsoon i.e., 0.833mg/l (bank) and 0.78mg/l (middle and minimum in pre-monsoon i.e., 16mg/l (Bank) and 0.15mg/l (middle). So the total chlorine was found to be under range.

TABLE : 1

S.No.	Parameter	Permissible Range/Limit	Location			
			Kalighat (pre-monsoon)		Kalighat (during monsoon)	
			Bank	Middle	Bank	Middle
1	pH	6.5-8.5	7.7	8.11	8.29	8.58
2	conductivity (µmho/cm)	0.15	0.25	0.24	2.13	0.44
3	DO (mg/l)	4-6	0.00	1.1	4.6	5.0
4	TDS (mg/l)	500	240	230	170	170
5	Fluoride (mg/l)	1-1.5	0.63	0.54	0.65	0.81
6	Iron (Fe) (mg/l)	03-1.0	0.21	0.3	0.90	0.59
7	Iodine (mg/l)	0.10-5.00	0.23	0.42	1.89	1.70
8	Lead (Pb) (mg/l)	0.05-5.00	0.06	0.10	0.76	0.59
9	Total chlorine (mg/l)	0.05-5.00	0.14	0.17	0.31	0.58

TABLE : 2

S.No.	Parameter	Permissible Range/Limit	Location			
			Kalighat (pre-monsoon)		Kalighat (during monsoon)	
			Bank	Middle	Bank	Middle
1	pH	6.5-8.5	8.31	8.12	8.58	8.42
2	conductivity (µmho/cm)	0.15	0.25	0.25	2.13	1.82
3	DO (mg/l)	4-6	0.6	0.6	1.7	2.8
4	TDS (mg/l)	500	240	230	160	160
5	Fluoride (mg/l)	1-1.5	0.57	0.55	1.17	1.08
6	Iron (Fe) (mg/l)	03-1.0	0.01	0.12	1.32	0.82
7	Iodine (mg/l)	0.10-5.00	0.64	0.62	3.62	3.58
8	Lead (Pb) (mg/l)	0.05-5.00	0.18	0.19	1.64	1.52
9	Total chlorine (mg/l)	0.05-5.00	0.16	0.15	1.14	0.76

TABLE : 3

S.No.	Parameter	Permissible Range/Limit	Location			
			Kalighat (pre-monsoon)		Kalighat (during monsoon)	
			Bank	Middle	Bank	Middle
1	pH	6.5-8.5	8.15	8.27	8.2	7.5
2	conductivity (µmho/cm)	0.15	0.26	0.23	0.42	0.42
3	DO (mg/l)	4-6	0.4	1.8	-	-
4	TDS (mg/l)	500	240	220	160	160
5	Fluoride (mg/l)	1-1.5	0.58	0.57	greater than 2.00	0.96
6	Iron (Fe) (mg/l)	03-1.0	0.05	0.08	1.34	1.13
7	Iodine (mg/l)	0.10-5.00	0.39	0.44	1.92	3.16
8	Lead (Pb) (mg/l)	0.05-5.00	0.15	0.13	0.69	1.21
9	Total chlorine (mg/l)	0.05-5.00	0.18	0.15	1.05	1.01

Mean of different parameters at three sampling station

TABLE : 4

PRE-MONSOON (KRISHNA GHAT, KALI GHAT & GANDHI GHAT)

Parameters	Ba+nk	Middle
pH	8.05	8.16
Conductivity(µmho/cm)	0.25	0.24
DO (mg/l)	0.33	1.16
TDS(mg/l)	240	226.6
Fluoride(mg/l)	0.59	0.55
Iron (mg/l)	0.09	0.07
Iodine (mg/l)	0.46	0.49
Lead (mg/l)	0.13	0.14
Total Chlorine (mg/l)	0.16	0.15

TABLE : 5

MONSOON (KRISHNA GHAT, KALI GHAT &GANDHI GHAT)

Parameters	Bank	Middle
pH	8.35	8.26
Conductivity (µmho/cm)	1.56	0.89
DO (mg/l)	2.73	3.50
TDS (mg/l)	163.33	163.33
Fluoride (mg/l)	1.46	0.95
Iron (mg/l)	1.18	0.84
Iodine (mg/l)	2.47	2.81
Lead (mg/l)	1.03	1.10
Total Chlorine (mg/l)	0.83	0.78

CONCLUSION

From present investigations we concluded that the quality of water samples from banks of Krishna and Gandhi Ghats was not suitable for drinking purpose in monsoon season. This is because of highest conductivity and high concentration of iron and fluoride. Concentrations of fluoride above 1.5 ppm in drinking water causes dental fluorosis, which results in discoloration of enamle .Fluoride can be incorporated into the mineral structure of bones, and in large amounts leads to a weaker bone matrix. Skeletal fluorosis results from long-term exposure to high levels of fluoride, and can have crippling results. It also damage thyroid, reproductive organs, gastrointestinal system & brain. Iron in water has many effects on aquatic life, both good and bad. At normal levels, iron does not affect any aquatic animals, but at higher levels when iron does not dissolve in water, fish and other creatures cannot process all the iron they take in from water or their food. The iron can build up in animals' internal organs, eventually killing them. Higher levels of iron in fish and aquatic plants also have negative effects on the people or creatures consuming them. Large amounts of iron promote growth of algae, which can block sunlight from other plants and can disrupt habitats and feeding practices. Extensive algae presence lowers water freshness and promotes stagnation. Iron fertilization or contamination affects the reproduction and feeding habits of fish and other animals.

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SUSTAINABLE DEVELOPMENT AND MANAGEMENT OF GROUND WATER RESOURCES

Darakshana * Bhawana Kumari * Ankita Gaurav * Jyoti Kumari * Basabi Mahapatra *

ABSTRACT : *In our project a systematic study has been carried out to assess the sustainable development and management of ground water resources. Groundwater is becoming an increasingly popular resource because of the relative ease and flexibility with which it can be tapped. While developing groundwater resource a promise to help alleviate poverty in many areas, the most formidable challenge is its sustainable use and management in regions where it is under threat. So, management of groundwater resource is a challenging task in the Indian context mainly due to the diversity of geomorphological, climatic, hydrological and socio-economic settings and the multiplicity of the factors involved in any management option. Management of groundwater resource necessities development of practical responses to extremely complex challenges. The variation in the distribution availability and stage of development in different parts of the country demands area specific and problem specific solution for optimal civilization of available groundwater resource. This solution to be successfully, should take into account factors such as the geomorphic setup, climate, hydrologic and hydrogeologic settings, groundwater quality. Water utilization pattern for various sector and the socio-economic setup of the region. By the given method sustainable development and management of groundwater resources can be done ;*

i) *Groundwater quality and its role in aquifer information system.*

ii) *Groundwater conservation and artificial recharge of groundwater.*

iii) *Management of groundwater problems.*

iv) *Development of groundwater in aquifer information system.*

KEYWORDS: Sustainable Management, Groundwater resources, Aquifer.

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INTRODUCTION

Groundwater is subsurface water which saturates the pore spaces above impermeable layers. It originates as rainfall or snow and the moves through the soil and rock into the groundwater system. There are some sources of groundwater :

i) **Connate Water :** At the time of rock formation water is trapped in the interstices of sedimentary rocks.

ii) **Meteoric Water :** It originates in the atmosphere, falls as rain and ultimate become groundwater by infiltration.

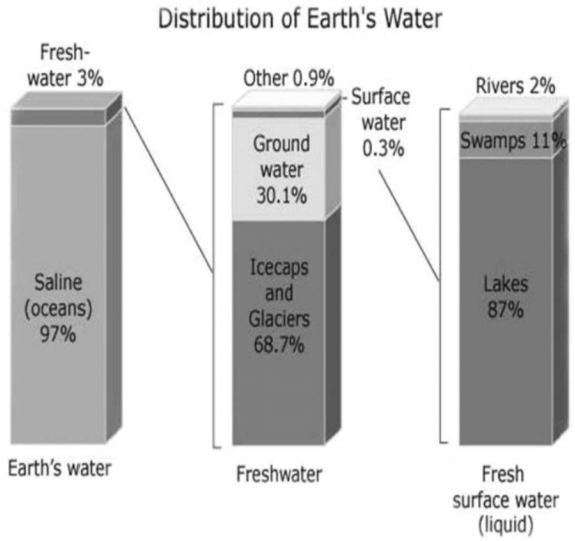
iii) **Juvenile Water :** It originates in the earth's interior and reaches the upper layers of the earth surface as magmatic water.

Half of all groundwater is available within 750 m of the earth's surface. Water below the ground is available in four zones, e.g; soil zone, intermediate zone, capillary zone, saturation zone.

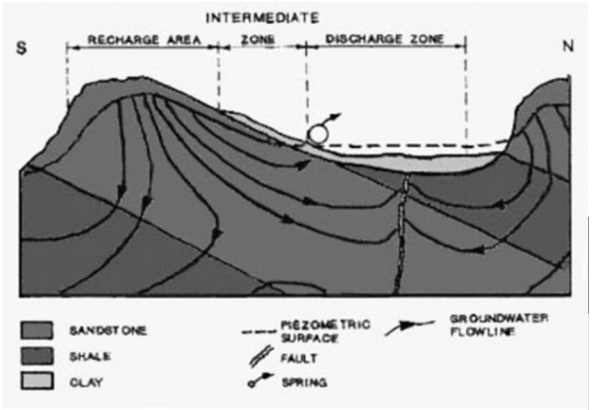
The zone where water is available is called "the zone of aeration". The upper boundary of the zone of saturation is known as the "water table". The zone of aeration is further sub-divided into three layers - soil moisture zone, intermediate zone, capillary zone collectively called vadose zone.

There are two forces which prevent groundwater from moving downward; (a) the molecular attraction between water and the rock and earth materials and (b) the molecular attraction between water particles.

Of all the earth's water, only 3% is freshwater, the rest is saline water, of all the fresh water on earth, 68.7% is permanently stored in icecaps and glaciers,30.1% is groundwater,0.3% is surface water and 0.9% is other minor storage. Thus, groundwater is about 100 times more plentiful than surface water.



Groundwater is naturally recharged upstream and downstream. Recharge areas are close to mountain peaks where precipitation is likely to be higher than in the adjacent lowlands. Deep groundwater discharges directly into the ocean.



Through human intervention, groundwater is subject to artificial discharge. It may also be subjected to artificial recharge. Excessive pumping can lead to groundwater depletion, wherein groundwater is extracted from an aquifer.

Groundwater flow has two major physical properties:

i) Hydraulic conductivity and specific yield

ii) Hydraulic conductivity is the rate at which water flows through porous media, expressed in velocity units.

Specific yield is the free-draining pore water volume expressed in per unit of total volume.

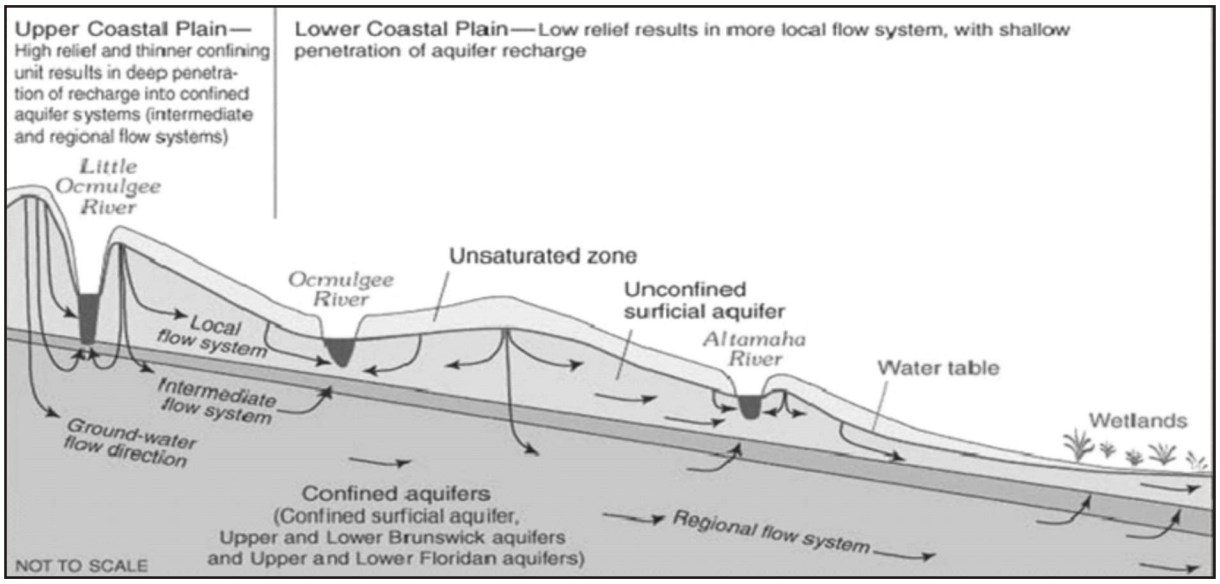
Groundwater flow is described by Dracy's law which states that the flow through an aquifer media (q) varies with the hydraulic gradient and cross sectional area

$Q = -KAI = -KA\ \partial h/\partial L = -Va$

Aquifers may be classed as confined or unconfined depending on the presence or absence of a confining impervious layer above or below the aquifer.

Unconfined aquifers lie near the surface constitute shallow groundwater.

Confined Aquifers May Constitute Either Shallow or Deep Groundwater



In groundwater, there are different chemical parameters.

A) Na (sodium) is the sixth most abundant element on earth is widely distributed in soils, plants, water and foods. Sodium is often naturally found in groundwater sources of sodium include

i) Irrigation and precipitation leaching through soils high in sodium.

ii) Ground water pollution by sewage effluent.

B) K (potassium) is an element found in soils and rocks. In water, K has no smell or colour, but may give water a salty taste.

Source of potassium include:

i) Leaching of fertilizers

i) Weathering and erosion of potassium bearing minerals.

C) Ca (calcium) is the fifth most abundant element. It enters the freshwater system through the weathering of rocks, and from the soil through the seepage, leaching and run off. Surface water generally contains lower concentrations of calcium than groundwater.

D) Carbonate And Bicarbonate is the primary source of carbonate and bicarbonate ions ion groundwater is the dissolved carbon dioxide in rain and snow; which as enters the soil dissolves more carbon dioxide.

Sustainability in water quantity must imply sustainability in water quality. The sustainability of groundwater for different purposes like drinking, irrigation and industry depends upon the presence of different chemical constituents in it. It is unsuitable for drinking as it contains iron but suitable for irrigation if having low sodium content.

Management of groundwater resources is a challenging task due to diversity of geomorphological, climatic, hydrological and socio-economic settings. Groundwater management is the application of water administration of groundwater.

Management of different aquifer systems needs consideration of various issues related to their disposition, recharge/discharge condition, quality aspects and socio-economic issues.

Groundwater management consists of "technical groundwater management and overall integrated groundwater management".

Most of the ground water are contaminated by fluoride, arsenic, iron, and nitrate. Intake of high arsenic water is toxic and causes health hazards. Groundwater management can be done by rain water harvesting and artificial recharge of the groundwater and conjuctive use of surface and groundwater. There is also need for creation of an information base, dissemination of information to stakeholders and stakeholder participation in all such management initiatives.

Water conservation is the use and management of water. It is used in agriculture, industry and the home.

The demand of water has increased over the years and this has lead to water scarcity.

India is heading towards a fresh water crisis mainly due to improper management of water resources and environmental degradation.

It is important to realize that groundwater is not a resource that could be utilized unmindfully simply because it is available in abundant quantities.

It should be conserved and improve the quality of groundwater.

Water use has to be integrated effectively with water regeneration.

Rainwater harvesting schemes should be made compulsory. Temple tanks need to be renovated and urban wetlands protected.

All these will contribute to a rise in the groundwater level. Community awareness and management of freshwater resources should be enhanced.

The selection of suitable techniques for artificial recharge of groundwater depends upon various factor :

i) Land use and vegetation
ii) Soil type and soil depth
iii) Rainfall pattern
iv) Environmental and ecological impacts of artificial recharge scheme proposed.

Artificial groundwater recharge is a process by which groundwater reservoir is augmented at a rate exceeding the augmentation rate under natural condition of replenishment.

Artificial recharge is a way to store water underground in times of water surplus to meet demand in times of shortage.

METHODOLOGY

An aquifer is an underground layer of water bearing permeable rock, rock fractures or unconsolidated materials from which groundwater can be extracted using water well. The study of water flow in aquifers and the characterization of aquifers are called hydrogeology.

Aquifers Are Mainly Of Three Types :

i) Consolidated
ii) Unconsolidated
iii) Semi-consolidated

Aquifers Are Divided Into Two Groups :

i) Porous information
ii) Fissured formations

Porous formation comprises of both unconsolidated and semi-consolidated formations. In this groundwater occurs in the primary pore spaces. Groundwater occurs in the secondary fractures form the fissured formations.

Aquifers may be classified as confined and unconfined depending on the presence or absence of a confining impervious layer above or below the aquifer.

Unconfined aquifer is one in which the aquifer rests on an impervious formation.

Unconfined aquifers are those into which water seeps from the ground surface directly above the aquifer.

Confined aquifer is bounded by impervious formations both above and below the groundwater.

Confined aquifers are those in which an impervious rock layer exists that prevent water from seeping into the aquifer from the ground surface.

Semi-confined aquifers are those in which an impermeable rock layer exists that prevent water from seeping into the aquifer from the ground surface.

Semi-confined aquifer i.e., leaky aquifer is an aquifer whose upper and lower boundaries are aquitards and the others is an aquiclude.

The properties of the aquifer for the study of groundwater hydrology:

i) **Porosity (n) :** Porosity is the percentage of rock or soil that is valid of material. The larger is the pore space or the greater their number, the higher the porosity and the larger the water holding capacity.

ii) **Permeability**

iii) **Transmissivity (T):** Tansmissivity is the discharge rate at which water is transmitted through a unit width of an aquifer under a unit hydraulic gradient.

iv) **Specific Yield (Sy)**

v) **Specific Retention (Sr)**

vi) **Storage Coefficient (S):** Storage coefficient is the volume of water released from storage, or taken into storage, per unit of aquifer storage are per unit change.

The aquifer parameters are required for planning groundwater development and management. These are required for planning the type and natural of wells to be constructed for various purposes.

For aquifer mapping, a manageable area has to be selected which may be cluster of villages, administrative unit.

If any chemical quality problem such as arsenic, fluorosis is prevailing in any area it can be selected for aquifer mapping.

For aquifer mapping, the different data has to be collected:

i) Agriculture and irrigation

ii) Hydrogeological data

iii) Hydological data

iv) Pumping test data

v) Hydro geochemical data

Pumping Test : A pumping test is performed to find out the behaviour of aquifer as well as the well is response to the stress applied in the form of pumping.

These tests are generally conducted to determine:

i) **Yield Test :** The yield tests are simple test which are performed to determine the yield and sustainability of a well.

ii) **Well Performance Test :** The well performance tests are conducted to determine the performance of the well and its efficiency.

iii) **Aquifer Performance Test :** In aquifer performance test, the well is pumped at a constant discharge and drawdown is measured in pumping well.

In pumping test the water is pumped from a well at a known discharge and the drawdown in the pumped well and observation well at known distances from the well is measured.

The methods to be applied for the estimation of aquifer parameters depends on the type of aquifer, number of observation wells, duration of pumping.

The transmissivity can be estimated from testing of single well, however, for more accurate estimation, measurements in several observation wells is required.

The design of aquifer test involves selection site and construction of test well and observation wells.

CONCLUSION

The indiscriminate and sometimes excessive use of groundwater has led to questions regarding sustainable development? The sustainability of groundwater utilization must be assessed from an interdisciplinary perspective, where hydrology, ecology, geomorphology and climatology play an important role.

Generally groundwater does not recycle as fast as the surface water, with rates of groundwater turn over varying from years to millennia, depending on aquifer location, type, depth, properties and connectivity.

Excessive pumping can lead to groundwater depletion where groundwater is extracted at a rate faster that it can be replenished. Unregulated groundwater used leads to the "Tragedy of the commons" with the eventual depletion of the resource and ruin to all.

The effects of excessive groundwater development tend to become apparent gradually with time often measured in decades. To assure sustainability, studies must show that the hydrological, ecological and other impacts of groundwater utilization are minimal. In addition to water quantity, sustainability must imply the preservation of water quality.

Techniques used for artificial recharge to groundwater broadly fall under the following categories :

DIRECT METHODS

A) **Surface Spreading Techniques**

i) Flooding

ii) Ditch and furrows

iii) Recharge basin

iv) Runoff conservation structures.

B) **Sub-Surface Techniques**

i) Recharge Wells

ii) Gravity Head Recharge Wells

iii) Recharge Pits and Shafts

INDIRECT METHODS

A) Induced recharge from surface water sources

B) Aquifer modification

i) Bore blasting

ii) Hydro-fracturing

Surface spreading technique is the most widely practiced methods of artificial recharge of ground water employ different artificial techniques of increasing the contact area and resident time of surface water with the soil so that maximum quantity of water can infilterate

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ANALYSIS OF CITRIC ACID OF FRESH AND STORED ORANGE JUICE

Umme Hani * Jyoti Shikha * Bina Rani *

ABSTRACT : *Citric acid is a weak organic acid having chemical formula C6H807and IUPAC name2-hydroxypropane-1,2,3-tricarboxylic acid. Citric acid is found in all citrus fruits such as lemons, limes and oranges. Citric acid act as a good natural preservative and is also used to add acidic and good taste to soft drinks as it is a nontoxic. Citric acid has an important compound of coenzyme.*

Medical interventions to increase urinary citrate are a primary focus in the medical managements of Urolithiasis. Its deficiency, obviously, retards general and mental growth and induces fatigue, fatty liver, graying of hair, reduces reproductive ability etc. In fresh and stored citrus juice, citric acid content can be quantitatively measured.

The procedure commonly used to achieve this, take advantage of the known reactivity of citric acid with sodium hydroxide and potassium permanganate by means of titration. We can calculate comparative accounts of the percentage of citric acid in fresh and stored orange juice.

KEYWORDS : Co-enzyme, Citric Acid Preservative.

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INTRODUCTION

Orange Juice is a popular refreshment drink. It is a source of vitamin C (ascorbic acid), citric acid [chemical formula $C_6H_8O_7$ and IUPAC name 2-hydroxypropane-1,2,3-tricarboxylic acid], Potassium and Folic acid (vitamin B9). Citrus Juice also contains flavonoids that are believed to have beneficial health effects. However, if on empty stomach, orange juice can exacerbate gastro-intestinal conditions and or cause mild and temporary stomach upset. Due to the citric acid, orange juice typically has pH of 3.5[1]. Drinking or sipping orange juice can therefore cause erosion of the tooth enamel, otherwise known as acid erosion. It is recommended to use a straw so that the juice does not come into contact with the teeth. 200 ml (about 7 ounces) of orange juice accounts for 1 of the recommended 5 pieces of fruit a day.

One of the major economic advantages of pervaporation is its low energy consumption. Compactness, flexibility, simplicity and insatiability are some other strong points of pervaporation. The

first step of this study is to identify major essence component in orange juice and to synthesize model solution. This is defined as the lowest concentration at which the aroma is perceptible. Due to its high level, relative to sensory threshold, it is obvious that ethyl butyrate is the major flavor ester present in orange juice with a concentration of approximately 0.79 ppm and can increase with advancing maturity of the fruit.

OBJECTIVE

To get a comparative account of the percentage of citric acid in fresh and stored orange juice.

MATERIALS AND METHODS

Apparatus : Conical flask, round bottom flask, pipette, burette, baker, water glass, glass rod and iron stand.

Chemicals : Orange Juice, Phenolphthalein, Sulphuric acid, sodium hydroxide.

Extraction of orange juice : Fresh oranges were picked up from the fields of Patna region. Some of the oranges were stored at 40C for 1 week and some of the oranges were crushed and juice was taken out. The juice was then filtered using cotton cloth so that the pulp and seeds were removed. Bottles were marked as F and S for fresh and stored juice respectively. Juice from fresh oranges was put in bottles marked F1, F2, F3 and juice from stored oranges was marked S1, S2, S3.

EXPERIMENTAL

The pH was measured with the help of a pH meter

pH of fresh orange juice is 5.2 at room temperature (35oC) and pH of stored orange juice (after 7 days) is 5.4.

Titration of fresh orange juice against N/10 NaOH

Diluted solution of fruit juice was prepared in a measuring flask. 4 gm of NaOH was weighed and diluted with distilled water up to its 250 ml volume. Diluted juice solution was titrated with the N/10 NaOH solution in the presence of one drop phenolphthalein indicator and the same process was repeated with the stored orange juice too.

RESULTS AND DISCUSSION

The calculations showed that citrate ion concentration was increased in the sample S1, S2 and S3 for stored juice. The strength of the fresh juice was found to be 12.5 N/10 whereas that of store juice was found to be 15 N/10.

Thus, there was an increase of 2.5 N/10 citric ion in stored orange juice samples. After one week storage of orange juice at 4oC gave this results. Citrus fruits are rich in citric acid, soluble in water and fats, citric acid is used as a flovoring and preservatives in food and beverages especially soft drinks.

CONCLUSION

The concentration of citric acid is higher in stored orange juice as compared to that of fresh one. So, the consumption of stored orange juice should be avoided.

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WATER QUALITY OF RIVER GANGA (PATNA) AND SOME POTABLE WATER

Neha Sinha * Aruna Krishna * Shaista Anjum * Anupma * Bina Rani *

ABSTRACT : *We present an extensive investigation of physico-chemical parameters on water samples of River Ganga and some potable water. Water samples under investigations were collected from different sources of water in Patna. Correlation coefficients were calculated between different parameters to identify the highly correlated and interrelated water quality parameters and t-test was applied for checking significance. The observed values of different physico-chemical parameters like pH, temperature, turbidity, total hardness (TH), Iron, Suspended solids (SS) of samples were compared with standard values recommended by world health organization (WHO). The values were within the desirable or maximum permissible limit set by WHO except turbidity which was high while NO3-, Cl-1 and F- were less than the values prescribed by WHO.*

KEYWORDS : Ganga Pollution, Physico-Chemical Parameter And Micro-Biological Characteristics

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INTRODUCTION

Water resources and water quality affect the economic, social and political development of the society. Ganga plain is one of the most densely populated regions of the world, due to its availability of water, fertile soil and suitable landscape. Rivers are considered as lifeline but are now adversely affecting the population of fluvial hazards (Singh, 2007).Today, over 29 cities, 70 towns, and thousands of villages extend along the Ganga banks. Nearly all of their sewage -over 1.3 billion liters per day -goes directly into the river, along with thousands of animal carcasses, mainly cattle (Bharadwaj et al 2011). Another 260 million liters of Industrial waste are added to this by hundreds of factories along the rivers banks. Domestic and Industrial wastewater constitute as a constant polluting source, whereas surface runoff is a seasonal phenomena mainly controlled by climate (Singh et al, 2004). Municipal sewage constitutes 80 percent by volume of the total waste dumped into the Ganga, and industries contribute about 15 percent of the majority of theGanga pollution. It is a fact that good water quality produces healthier humans than one with poor water quality.

Ganga River is life line of Patna and its water is used for domestic and agriculture purposes therefore, effective maintenance of water quality is required through appropriate measurements. Physico-chemical and micro-biological characteristics may describe the quality of water (Sinha, 1986), therefore, an analysis on physico-chemical parameters of Ganga water was made by many workers (Mehrotra, 1990; Sinha et.al. 2000).

In the present study various parameters (colour, odour, pH, alkalinity, total hardness, DO) of six water samples from different sites were analyzed.

Ganga pollution is mainly organic waste, sewage, trash, food, and human and animal remains

MATERIAL AND METHODS

Experimental: These samples were collected in plastic bottles. During sampling pH and temperature were determined using pH meter and thermometer respectively. The laboratory analysis of samples were done using standard methods. Titrimetric method was used for the determination of total alkalinity. Complexometric method was used for determining chloride content, whereas EDTA titrimetric method was used for total hardness analysis, experimental method used for treatment of water.

Water sample were collected from four different sites:

Sample 1 : Ganga river water from the ghats of Patna city. .

Sample 2 : Handpump water from college.

Sample 3 : Aqua guard purified water which is collected from Patna city.

Sample 4 : tank water from college.

RESULTS AND DISCUSSION

Colour	All the samples were colourless water.
Odour	Allthe samples were odourless.
Temperature	Ground water > ganga water > purified water > tank water
Ph	Ganga water has the minimum pH of 7.82 whereas tank water has the maximum pH 8.36.
Conductivity	Purified water >tank water >ganga water >ground water
TDS (Total Dissolved Solids)	Ground water >Purified water > Ganga water > tank water Ground water: 9.45 ppm Purified water: 9.30 ppm Ganga water: 9.00 ppm Tank water: 8.93 ppm
Total Hardness	According to WHO standards, HDL and MPL of total hardness is 300- 600 ppm. Allthe samples were analyzed for total hardness. Hardness is as follow: Tank water>ground water>ganga water>purified water.
Chloride Content	According to WHO standards, HDL and MPL of chloride is 250 - 1000 ppm. Highest chloride content was found in tank water and lowest chloride content was in purified water.
Fluoride, Iodide, lead, Iron	Fluoride, Iodide, lead, Iron were also analyzed using the experiment. Ganga Water has it lower than the prescribed WHO standards. Tank water>ground water> Ganga water>purified water.

CONCLUSION

A large number of factors and geological conditions influence the correlations between different pairs of physico-chemical parameters of water samples.From the present study we conclude that tank water is most probably not fit for drinking and it needs to be treated to reduce the contaminations, specially the alkalinity and hardness. Next,Ganga water is not suitable for drinking and hence efforts should be made to minimize the contamination of Ganga water at Patna city.The values obtained through the experiment will help significantly in selecting the proper source of water.

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DETERMINATION OF INHIBITION EFFICIENCY OF MANDELIC ACID IN-VITRO FOR DISSOLUTION OF KIDNEY STONE

Archana * Rithika * Basabi Mahapatra *

ABSTRACT : *As we know, urolithiasis, disease exists in endemic proportions in some parts of our country. Urinary stones contain both crystalloid and colloid components. The crystalloid components are mainly Calcium Carbonate, Calcium phosphate, calcium oxalate, magnesium ammonium phosphate, uric acid and cystine. Stone formation is apparently related to the level of urinary inhibitors of calculogenesis in urine. Human urine is known to contain some protective compounds called inhibitors. These compounds sequestrate the stone forming salts and prevent super saturation of urine with respect to the latter. A number of inhibitors, viz., citric acid, pyrophosphate, magnesium ions, zinc ions, nephrocalcin and glycosaminoglycans have been identified. However, the mechanism of action of these inhibitors is not yet clear. Chemistry involved in their action, as well as, the optimum level of these inhibitors and their mutual effects on each others inhibition efficiency is also not very clear. The inhibition efficiency of each of the inhibitors might also be a function of chemical composition of the urine. Inhibition efficiency of chelating anion would also be a function of the level of coordinating metal ions, particularly the trace metal ions in urine. An ideal inhibitor must be an ideal sequestering agent under the given chemical environment. A 'sequestering agent' is sufficiently strong to dissolve common precipitates of the metal being complexed. It means, the complexing ability of a sequestering agent must be compared with the insolubility of the precipitates being sequestered. This is done on the basis of free metal ion in equilibrium with either the complex or the precipitate. If the value of free metal ion is lower for the complex than for the precipitate, the precipitate will of course dissolve, so that the complexing agent is then a sequestrate under experimental conditions, since the calcium ion concentration in triphosphate and longer chain phosphate is lower than all of the usual 'Insoluble' calcium salts, these phosphates are capable of dissolving these salts.*

KEYWORDS : Urolithiasis, Kidney Stone, Nephrocalcin, Mandelic Acid.

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INTRODUCTION

Kidney stones are one of the most painful urologic disorder which have beset humans for centuries. Scientists have found evidence of kidney stones in a 7000 years of old Egyptian Mummy. Each year people make almost 3 million visits to health care providers and more than half a million

people go to emergency for kidney stone problems. Kidney stones are formed when urine becomes concentrated. Certain substance like calcium oxalate, phosphate and carbonate, uric acid or cystine in the urine leaves small residue or crystal along the inner surface of the kidneys. Kidney stone is a hard mass developed from crystal that separate from the urine within the urinary tract. Normally urine contains chemicals that prevent or inhibit the crystals from forming stones. These inhibitors do not seem to work for everyone. Present day remedy of the removal of the stones by surgery is highly expensive and have not been found so effective because of the recurrence of stone and also owing to its side effects. Designing out a suitable physiologically non toxic compound, which could selectively complex the calcium salts present in the urinary stones and result in the formation of aqueous soluble species could be an important breakthrough in urinary stone dissolution. This project describes that Mandelic acid is a good inhibitor for calcium phosphate, calcium carbonate and calcium oxalate mineralization. Experimental models namely "Simultaneous flow static model (S.S.M), Simultaneous flow dynamic model (S.D.M), Reservoir static model (R.S.M). Reservoir dynamic model (R.D.M) were designed. An attempt has been made to show the vitality of Mandelic acid to act as inhibitor for this endemic disease.

A kidney stone is a hard mass developed from crystals that separate from the urine within the urinary tract. Kidney stones are formed when urine becomes concentrated. Certain substance like calcium oxalate ions uric acid or cystine in the urine leaves small residue or crystal along the inner surface of the kidneys. Normally, urine contains chemicals that prevent or inhibit the crystals from forming stones. These inhibitors do not seem to work for everyone, however, so some people form stones. Kidney stones may contain various combinations of chemicals. The most common type of stone contains calcium in combination with either oxalate or phosphate. These chemicals are part of a person's normal diet and make up important parts of the body, such as bones and muscle. A less common type of stone is caused by infection in the urinary tract. This type of stone is called a strucvite or infection stone. Another type of stone, uric acid stones are a bit less common and cystine stones are rare.

Causes Of Kidney Stones

Doctors do not always know what causes a stone to form. While certain foods may promote stone formation in people who are susceptible, scientists do not believe that eating any specific food causes stones to form in people who are not susceptible. A person with a family history of kidney stones may be more likely to develop stones. Urinary tract infections, kidney disorders such as cystic kidney diseases, and certain metabolic disorders such as Hyperparathyroidism are also linked to stone formation. In addition, more than 70 percent of people with a rare hereditary disease called renal tubular Acidosis develops kidney stones. Cystinuria and hyperoxaluria are two other rare, inherited metabolic disorders that often cause kidney stones. In cystinuria, to much of the amino acid cystine, which does not dissolve in urine, is voided, leading to the formation of stones made of cystine. In patients with hyperoxaluria, the body produces too much oxalate, a salt. When the urine contains more oxalate than can be dissolved, the crystals settle out and form stones. Hypercalciuria is inherited, and it may be the cause of stones in more than half of patients. Calcium is absorbed from food in excess and is lost into the urine. This high level of calcium in the urine causes crystals of calcium oxalate or calcium phosphate to form in the kidneys or elsewhere in the urinary tract. Other causes of kidney stones are hyperuricosuria, which is a disorder of uric acid metabolism; gout; excess intake of vitamin D; urinary tract infections; and

blockage of the urinary tract. Certain diuretics, commonly called water pills, and calcium-based antacids may increase the risk of forming kidney stones by increasing the amount of calcium in the urine. Calcium oxalate stones may also form in people who have chronic inflammation of the bowel or who have had an intestinal bypass operation, or ostomy surgery. As mentioned earlier, struvite stones can form in people who have had a urinary tract infection.

Formation Of Kidney Stones

There are several conditions that can contribute to the formation of kidney stones: A high concentration of stone-forming mineral salts in the Urine. When high levels of stone-forming substances such as Calcium oxalate, calcium phosphate, or struvite are present in the urine, one or more crystal may form and become trapped within the urinary tract. The crystal may attract other crystals and bind together with them, growing into a stone.

An uneven balance of acid in the urine, the acidity or alkalinity of the urine affects the ability of stone-forming substances to remain dissolved. Some types of stones will form in acidic urine; others will form only in alkaline urine.

Normally, substances that inhibit the formation and growth of crystals - such as pyrophosphates, citrates, and magnesium are present in the urine. A decrease in or absence of these substances may cause a stone to develop.

Calcium stones form from the following:

Most calcium stones form for unknown reasons, although a genetic basis is suspected. Certain foods can upset the balance of acid in the urine. Cancer can cause the body to produce an abnormally large amount of parathyroid hormone, which regulates calcium levels in the body. High levels of this hormone can break down bone and releases too much calcium into the blood. As a result, calcium saturates the urine.

Uric acid stones form from the following: Gout, the result of a genetic defect, is a disease that increases the body's production of uric acid. High levels or uric acid in the urine can cause stones to form. An inherited tendency can lead to the development of this type of stone, although the specific reason is unknown. Certain gastrointestinal conditions, such as ulcerative colitis, also can lead to the formation of uric acid stones. Cystine stones can form from high amounts of cystine in the urine, the result of a rare in inherited abnormality. Struvite stones may form in the kidney or bladder as a result of infection from certain bacteria.

Symptoms Of Kidney Stones

Kidney stones often do not cause any symptoms. Usually, the first symptom of a kidney stone is extreme pain, which begins suddenly when a stone moves in the urinary tract and blocks the flow of urine. Typically, a person feels a sharp, cramping pain in the back and side in the area of the kidney or in the lower abdomen. Sometimes nausea and vomiting occur. Later, pain may spread to the groin. If the stone is too large to pass easily, pain continues as the muscles in the wall of the narrow ureter try to squeeze the stone into the bladder. As the stone moves and the body try to push it out, blood may appear in the urine, making the urine pink. As the stones moves down the ureter, closed to the bladder, a person may feel the need to urinate more often or feel a burning sensation during urination. If fever and chills accompany any of these symptoms, an infection may be present. In this case, a person should contact a doctor immediately.

Diagnosis Of Kidney Stones

Sometime "silent" stones - those that do not cause symptoms are found on x rays taken during a general health exam. If the stones are small, they will often pass out of the body unnoticed. Often,

kidney stones are found on an x ray or ultrasound taken of someone who complains of blood in the urine or sudden pain. These diagnostic images give the doctor valuable information about the stone's size and location. Blood and urine tests help to detect any abnormal substance that might promote stone formation.

The doctor may decide to scan the urinary system using a special test called a computerized tomography (CT) scan or an intravenous pyelogram (IVP). The results of all these tests help determine the proper treatment.

MANDELIC ACID

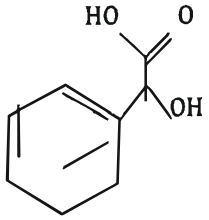
Mandelic acid is an aromatic alpha hydroxyl acid with the molecular formula C6H4CH (OH)CO2H.

PROPERTIES

It is a white crystalline solid which is soluble in water and polar organic solvents.

STRUCTURE

Since the molecule is chiral, it exist in either of two enantiomers as well as the racemic mixture known as paramandelic acid.



USES

Mandelic acid has long history of use in the medical community as an antibacterial particualarly in the treatment of urinary tract / infection. It is a useful precursor to various drugs. It has also been used as an oral antibiotic. In skin care, it is also an alternative to glycolic acid in skin care product.

OBJECTIVES

i) To determine the in-vitro inhibition efficeincy of mandelic acid for dissolution of kidney stone.

ii) Study of the formation of kidney stone.

iii) Dissoltuion of renal stone by Mandelic acid.

HYPOTHESIS

Form literature survey, it has been formed that certain aromatic hydroxy acids and their natural products are capable of dissolving out urinary stone forming minerals such as calcium phosphate, calcium oxalate and calcium carbonate. The calcium slats are found to be present in most of the urinary stones. The high insolubility of urinary stones is mostly due to the presence of these salts. These insoluble compound, when react with physiologically non-toxic naturally occurring compounds may undergo no replacement type of chemical reaction through the formation of soluble complexes. Such studies would be helpful for dissolving in designing drugs for dissolving at least partially the "urinary stone".

APPARATUS USED

- Burettes
- Conical Flasks
- Electric balance
- Magnetic stirrer

EXPERIMENT

Crystalloid forming solutions viz. 0.01M solutions of calcium chloride, sodium phosphate, sodium oxalate, sodium carbonate, were prepared in distilled water. Four experimental models namely "Simultaneous flow static model" (S.S.M,), "Simultaneous flow dynamic model" (S.D.M) "Reservoir static model" (R.S.M.) and "Reservoir dynamic model" (R.D.M.) were designed. In the S.S.M., the two salt forming solutions viz, sodium phosphate and calcium chloride (for calcium phosphate) and the inhibitor (tartaric acid) were taken in three separate burettes (50 ml) and were allowed to fall simultaneously into a 250 ml beaker in a slow (drop wise) and equal speed. At the end the mixture was digested in a hot water both for 10

minutes, cooled to room temperature and the precipitate was collected by filtering the solution through a pre-weighed whatman's filter paper. Next, the filter paper along with the precipitate was dried in an air oven at 120ºC, cooled to room temperature and weighed, the weight of the precipitate was determined in the S.D.M., the process was same except that the reaction mixture in the beaker was continuously stirred on magnetic stirrer during the flow of salt forming solution and the inhibitor. In the R.S.M., the whole amount of inhibitor solution (50ml) was placed in the beaker in the beginning itself and the two salt forming solutions were allowed to run into it drop wise through burette. Thus a reservoir of inhibitor was created into which the salt forming solutions ran down. Rest of the operation was same as in other models. In the R.D.M., the process was same as R.S.M. except that the reaction mixture was stirred continuously on a magnetic stirrer. Simultaneous blank experiments with water in place of inhibitor were also carried out for evaluating the inhibitor efficiency of inhibitor compared to water. All experiments were conducted at room temperature (30 - 34ºC). Percentage efficiency of inhibition of inhibitor was calculated using the formula:

$$\text{Inhibition efficiency (\%)} = \frac{(\text{Wt. of ppt. blank set}) - (\text{Wt. of ppt. in expt. Set})}{\text{Wt. of ppt. in blank set}}$$

DISSOLUTION OF WHOLE RENAL STONES BY MANDELIC ACID

A renal stone was collected from Patna Medical College and Hospital and then it was suspended in 50 ml of 0.01 N Mandelic acid for 24 hrs. The sample washed with distilled water, dried in an oven at 180C for 12 hrs. cooled and weighed. This experiment was done for two different renal stones separately 24 hrs, cooled and weighed. This experiment was done for two different renal stones separately 24 hrs. and 48 hrs. The inhibitor condition was kept the same throughout the experiment.

TABLE : 01

INHIBITION OF CALCIUM OXALATE MINERALIZATION BY DL-MANDELIC ACID

SALT FORMING SOLUTIONS: 0.01 M $CaCl_2$ and 0.01 M $Na_2C_2O_4$									
Inhibitor	Conc. (M)	Wt. of PPt (In grams)				Inhibition Efficiency (%)			
		SSM	SDM	RSM	RDM	SSM	SDM	RSM	RDM
Water (Blank)	-	0.1103	0.0983	0.1057	0.0389	-	-	-	-
DL – Mandelic Acid	0.01	0.0619	0.0563	0.0751	0.0321	78.19	42.72	28.94	17.48

TABLE : 02

INHIBITION OF CALCIUM PHOSPHATE MINERALIZATION BY DL-MANDELIC ACID

SALT FORMING SOLUTIONS: 0.01 M $CaCl_2$ and 0.01 M Na_3PO_4									
Inhibitor	Conc. (M)	Wt. of PPt (In grams)				Inhibition Efficiency (%)			
		SSM	SDM	RSM	RDM	SSM	SDM	RSM	RDM
Water (Blank)	-	0.1185	0.0957	0.0724	0.0647	-	-	-	-
DL – Mandelic Acid	0.01	0.0721	0.0608	0.0604	0.0582	39.15	31.35	16.57	10.04

TABLE : 03

INHIBITION OF CALCIUM CARBONATE MINERALIZATION BY DL-MANDELIC ACID

SALT FORMING SOLUTIONS: 0.01 M $CaCl_2$ and 0.01 M Na_2CO_3									
Inhibitor	Conc. (M)	Wt. of PPt (In grams)				Inhibition Efficiency (%)			
		SSM	SDM	RSM	RDM	SSM	SDM	RSM	RDM
Water (Blank)	-	0.400	0.0486	0.0234	0.0496	-	-	-	-
DL – Mandelic Acid	0.01	0.0304	0.0460	0.0210	0.0490	24	5.34	10.25	1.20

TABLE : 04

DISSOLUTION OF KIDNEY STONE BY MANDELIC ACID

S.No	Sample	Time (Hrs)	Wt. of PPt (In grams)			% of Distillation	Inhibitor 0.01
			Initial	Final	Difference		
1	I	24	0.0150	0.0122	0.0028	18.7	Mandelic Acid
2	II	48	0.0122	0.0098	0.0024	19.6	
3	III	24	0.0175	0.0135	0.0040	22	
4	IV	48	0.0135	0.0176	0.0041	30.4	

DISCUSSION

Mandelic acid used as inhibitor for calcium phosphate oxalate or carbonate mineralization. Our present observation concerning the inhibition efficiency of mandelic solution towards the precipitation of calcium phosphate, calcium oxalate and calcium carbonate are recorded in table 1,2 & 3 respectively.

Study of table 1,2,3 suggests that mandelic acid is a moderate inhibitor of calcium phosphate and calcium carbonate mineralization for calcium phosphate inhibition efficiency varies in the range of 10% - 39% while for calcium carbonate it varies in the range of 1.20% to 24%. It is a moderate to good inhibitor for calcium oxalate mineralization. The inhibition efficiency in the range of 17% to 78%.

A comparative study of four different models indicates that SSM is more effective than R.D.M. because dilute solutions of inhibitor are more effective in case of mandelic acid so in case of reservoir model due to the presence of large concentration of inhibitor lesser units are available for complexatin with calcium ions as the already linked to each other in the reservoir. While in case of simultaneous models due to lesser inter - lined units, more units, more units are available for complexation with calcium ions and inhibition efficiency becomes grater.

The difference in weight of whole calculus before and after the treatment with it gave a clear indication of dissolution of some ingredients of the calculus, which remained in the solution.

The result of our experiment shows that the percentage solubility of the whole renal calcui is 18% to 22% by the mandelic acid per 24 hrs. Hence, it is concluded that the mandelic acid is a good inhibitor for calcium oxalate.

CONCLUSION

The experiments that we performed clearly show that Mandelic acid is a good inhibitor for calcium oxalate, calcium phosphate and calcium carbonate mineralization. Hence, we conclude that:

- Mandelic acid has high inhibitor efficiency for calcium oxalate and calcium phosphate mineralization
- The inhibitor is less effective in the inhibition of calcium carbonate mineralization

- Among these four model SSM, SDM, RSM, RDM, SSM is found to be most effective model in the inhibition of calcium salt mineralization
- Dissolution efficiency of D, L-Mandelic acid for the two different sample (differ in weight) of renal stones
- The first two sample was kept for 24 hrs, it was found that the dissolution capacity for the 2nd sample is more dissolution efficiency i.e. 22% in comparison to 1st sample i.e. 18%
- In the 2nd step we kept the two renal stones for 48 hrs. it was found that the dissolution capacity is more for 2nd renal stone in comparison to first one i.e. 19% to 30%
- From the above conclusion it was observed that when we increases the time of dissolution i.e. 24 hrs. to 48 hrs. We found that dissolution capacity of renal stones also increases

NATURAL REMEDIAL MEASUREMENTS

It is generally recognized that a significant risk to stone formation is presented by certain nutritional factors particularly for urinary stone of the calcium oxalate type and for the uric acid. A high fluid intake is the only nutritional modification that may be applied in all forms or cause of urolithiasis except infective stones. By increasing urine output, urinary concentration of constituent ions and the saturation of stone forming slats are lowered. It has been demonstrated that reducing the nutrient density by the addition of fiber to the diet reduces the urinary excretion of calcium oxalate and uric acid in calcium stone formers.

Folk - medicines, tell us that lemon juice, water extract of kurthi kalai (a pulse), juice of pother chur leaves, water extract of raddish leaves, seeds kakur, help in the dissolution of urinary stones. All these extracts contain high percentage of pyrophosphate and plant acid. Pyrophosphate, i.e. a chain phosphate, has been proved in - vitro to be a very good inhibitor, as well as, successful solubiliser for all the ingredients than are usually present in renal stones i.e., calcium oxalate, calcium phosphate and magnesium ammonium phosphate. Plant acid, such as citric malonic and tartaric acids form stable and water soluble complexes with the insoluble ingredients or urinary stones.

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DETERMINATION OF CONTENT OF SOFT DRINKS

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ABSTRACT : *A Soft drink is a beveragethat contains carbonated water, sweetener and flavouring. Chemically it contains alcohol, carbohydrate and carbon dioxide.*

After conducting several tests we concluded that all the soft drinks contain glucose, sucrose, alcohol and carbon dioxide. All are acidic in nature in which Cocacola is most acidic and Limca is least acidic.

KEYWORDS : Coca Cola , Sprite , Limca , Fanta, Glucose, Sucrose , Alcohol , Carbon Dioxide.

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INTRODUCTION

The era of cold drinks began in 1952 but the industrialization in India marked its beginning with launching of Limca and Goldspot by Parley group of companies. Since in the beginning of the cold drinks it was highly profitable so many companies launched their brands in India like Pepsi and Coke.

A soft drink also called fizzy drink is a beverage that contain carbonated water, a sweetener and flavouring. The sweetener may be sugar, high-fructose, corn syrup, fruit juice, sugar substitutes (in the case of diet drinks) or some combination of these. Soft drinks may also contain caffeine, colouring, preservatives and other ingredients.

METHODS AND MATERIAL

Methods

i) Detection of pH
ii) Test for Glucose
- Benedict's Reagent Test
- Fehling Solution Test

iii) Test for Sucrose
iv) Test for Alcohol
v) Test for Carbon dioxide

Apparatus Required : Test tube, Test tube holder, Tet tube stand, Stop watch, Beaker, Burner, pH paper, Tripod stand, China dish , Wire gauge , Water bath.

Chemicals Required : Iodine solution, Potassium Iodide, Sodium hydroxide, Fehling's A and Fehling's B solution and Benedicts Reagent.

EXPERIMENTAL

A) **Detection Of pH :** Small sample of different soft drinks were taken in a test tube and measured the pH by immersing pH paper in it. The change in colour of pH paper was noticed and was compared with standard pH scale.

Result - All the soft drinks taken were acidic.

B) **Test For Glucose**

i) **Benedict's Reagent Test :** Small sample were taken in different test tubes and a few drops of Benedict's reagent were added. The test tube was heated for a few seconds.

Result- Reddish colour precipitate obtained in all the soft drinks confirmed the presence of Glucose.

ii) **Fehling's Solution Test :** Small sample were taken in different test tubes and a few drops of Fehling's A solution and Fehling's B solution was added in equal amount. The test tubes were heated in water bath for 10 minutes.

Result- Reddish colour precipitate obtained in all soft drinks taken confirmed the presence of Glucose.

C) **Test For Sucrose :** 5 ml sample of each brand of soft drinks were taken in separate china dishes and were heated very strongly until the colour changes.

Result- Black residue obtained from all samples confirmed the presence of sucrose in all soft drinks.

D) **Test For Alcohol :** Small samples were taken in different test tubes and Iodine followed by Sodium Hydroxide solution were added to each test tube. Then the test tubes were heated in hot water bath for 30 minutes.

Result- All samples give yellow precipitate. Hence all the soft drinks contains Alcohol.

E) **Test For Carbon Dioxide :** As soon as bottle were opened, one by one the samples were passed through lime water. The lime water turned milky.

Result- All the samples turned the lime water milky, thus all contain carbon dioxide.

RESULTS AND DISCUSSION

After conducting several tests, it was concluded that different brands of soft drinks namely, Coca cola, Sprite, Limca and Fanta all contain Glucose, Sucrose, Alcohol and Carbon dioxide.

All are acidic in nature.

CONCLUSION

According to our experiment, Coca cola is most acidic and Limca is least acidic. Sprite has minimum amount of carbon dioxide and Fanta has maximum amount of carbon dioxide.

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EXPERIMENTAL STUDY OF THE MAGNETIC PROPERTIES OF SOME NANO CRYSTALLINE FERRITES

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ABSTRACT : *Nano" comes from the word DWARF. Nanoparticles are the particles in the range of 1nm-100nm. To understand the properties, behaviour and structure of the particles in this scale is Nanoscience. Application of Nanoscience is Nanotechnology. This technology is used in the development of devices of very small size and in the improvement of existing materials by reducing the size.*

KEYWORDS: Nano, Nanoparticles, Materials, Structure

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INTRODUCTION

The size reduction increases the surface to volume ratio, free energy content, and band gap as well as defect concentration. This way nanomaterial acquires some interesting properties which we do not observe in bulk size.

Structural, electronics, magnetic and optical properties that we observe in bulk size get modified in nano size, which depends on size, shape, composition and method of preparation.

In the nanocrystalline phase, ferrites exhibit properties that are notably different from their bulk phase properties and strongly dependent on the conditions and preparation techniques.

In this paper, we present magnetic behavior of nanocrystalline specimen of Copper ferrite and La-substituted Copper ferrite.

MAGNETIC PROPERTIES OF MATTER

Weak magnetic effects occur in all substances, gas and liquid as well as solid, but the greater proximity of the atoms in a solid can lead to stronger cooperative effects. The magnetic effects in magnetic materials are due to atomic magnetic dipoles in the materials. These dipoles result from

the effective current loops of electrons in atomic orbits, from effects of electron spin and from the magnetic moments of atomic nuclei i.e. to study the magnetic effects in an atom, we should look for various sources of currents within the atom and their contribution to the overall magnetic effects.

Diamagnetism : Diamagnetism is a small and very weak effect in many materials caused by the reaction of the orbiting electrons to an applied magnetic field in accordance with Lenz's law, so that the magnetization and hence the susceptibility are both negative. Examples- Antimony, Bismuth Mercury, Gold and copper.

Para Magnetism : The permanent magnetic moments of the atoms or ions are acted upon individually with no mutual interaction among them (randomly distributed), this effect is called paramagnetism. They have a weak magnetization and susceptibility. Effectively materials with atoms of unpaired spins are paramagnetic. Examples- manganese, platinum, tungsten, some members of rare earth group and ions formed by removing and adding electrons to basic atoms there by creating unpaired spins

Ferromagnetism : Ferromagnetism arises from the alignment of electron spins throughout the solid, and this occurs for partially filled bands with a high density of states near the Fermi level. Examples- iron, cobalt, nickel, and a few of the lanthanides (Gd, Tb).

Antiferrromagnetism : When the distance between interacting atoms is very small, the exchange forces produce a tendency to antiparallel alignment of the neighboring spin dipole moments, this effect is called antiferromagnetism. Example - MnO4, MnS, FeO, FeCl2, NiO, MnF2, Cr and Mn.

Ferromagnetism : Neel envisaged a portioning of the moments into two sub lattices which because of their mutual interaction are aligned antiparallel to each other thus producing a total magnetic moment equal to the difference between their individual magnitudes. The class of materials having these properties namely a macroscopic moment that result from an antiferromagnetic interaction but with an unbalance of the two spin systems has been given the name Ferrimagnetism.Examples-salts of some of the transition metals particularly which crystallize in the spinal structure and contain in some measure one of the known ferromagnetic elements.

OBJECTIVE

To prepare nano copper ferrite and copper ferrite induced with lanthanum, study their XRD and VSM measurements to explore their potential use in technology.

MAGNETIC NANO MATERIALS

Magnetic nano particle understanding the magnetic properties of nanometer scale particles is central issue in magnetic materials. Magnetic nanoparticles themselves are used as active component of ferrofluids, recordingtapped.flexible disk recording media as well as biomedical materials and catalyst. Assemblies of nano scale magnetic grains make up hard disk recording media, permanent magnet and new crystalline soft materials. These diverse technological applications are the focus of much research but magnetic nanoparticles are also used as research tools in areas of material physics, geology, biology and medicine.

The implication of nanoscience in the field of magnetic materials give enough motives for the study of magnetic nanoparticles.like super magnetism, collective magnetic excitation, random anisotropy,metastable cations distributions, spin canting etc. can be realized which are not that important to bulk magnetic materials. In addition, the typical magnetic properties such as saturation, magnetization and coercitivity also differ a lot in many respects when compare to the corresponding bulk materials. The coercitivity varies with particle

size, it first increases for a certain limit with decreasing particle size then decreases further on decrease in size. At some stage one observes again an increase coercitivity and the finally converges to zero very rapidly when particle size reaches super magnetic limit. Magnetic properties are also sensitive to large surface volume ratio in nanoparticles. The main effects are the orientation disorders surface spins (spin canting) and the over-whelming of surface and isotropy.

Magnetic nanoparticles have unique magnetic features that can be applied to specific medical techniques. These include separation, immunoassay, magnetic resonance imaging and many others. Drug delivery and hyperthermia are enhanced by use of appropriate magnetic particles. Magnetic cationic lipsomes (MLCs) can be used as carrier for introducing into cells and heat mediators for cancer therapy. Immobilization, modification, and isolation, detection of biologically active compounds, xenobiotics, cells and cell organelles can be effectively carried out with the help of magnetic nanomaterials.

Ferromagnetic materials are the salts of some of the transition metal particularly which crystallizes in the spinal structure and contain in some measure one of the known ferromagnetic element. They are called ferrite. The chemical formula for the ferrite may be written as XY_2Z_4 in which X is divalent negative ions, Z is the mostly the divalent oxygen ion and Y is Fe^{3+}.

Ferrite off great technical importance because the exhibit spontaneous magnetic moment below Curie temperature just as iron, cobalt and nickel. Ferrites have a disadvantage that they have low electrical resistivity. Some types of ferrites are:

Soft Ferrites : These ferrites can be easily magnetized and demagnetized. They are used in applications like magnetic core materials and Switched Mode Power Supply which involves easy magnetization and demagnetization at high frequency. Because of its controlled magnetization it is used in electric industry. Manganese-Zinc and Nickel-Zinc ferrites are the most used soft ferrites.

Hard Ferrites : These ferrites retained their magnetism once they are magnetized. It is hard to demagnetize them on the other hand. They are basically called as permanent magnet whereas a very high saturation magnetization and coercive force is required. Hard ferrites are found in permanent magnetic starter motors, electronic mufflers, magnetic gaskets, generators and magnetic levitation etc. Hexagonal ferrites are used in loudspeakers whereas they replace more expressive alnico permanent magnets. They are also used in telephone ringer and receivers, door closers, seal latches and refrigerators and in toys. Barium and strontium based ferrites are the most used hard ferrites.

Taking the Crystal structure and magnetic ordering in account, ferrites are of four types-

TYPE	STRUCTURE	GENERAL FORMULA	EXAMPLES
Spinel	Cubic	$A^{II}Fe_2O_4$	A^{II}=Zn,Cd,Ni,Mg,Cu,Caetc
Garnet	Cubic	$Ln^{II}{}_3Fe_5O_{12}$	Ln^{II}=Sm,Eu,Id,Tb,Dyetc
Magnetoplumbite	Hexagonal	$A^{II}Fe_{12}O_{19}$	A^{II}=Ba,Sretc
Orthoferrites	Pervoskite	$Ln^{III}{}_3FeO_3$	Ln^{III}=Sm,Eu,Id,Tb,Dyetc

Spinel Ferrites : These are the simplest among the ferrites possessing the structure of natural spinel $MgAl_2O_4$.The group of ferrites belonging to the spinel family has the general formula MFe_2O_4 where M is the divalent metal like Mg, Mn, Fe, Co, Ni,Cu, Znetc, with Fe ion in +3 charged states for example - $NiFe_2O_4$,$CoFe_2O_4$, $CuFe_2O_4$ etc.

Magnetoplumbite Ferrites : These ferrites posses large number of oxides with hexagonal structure. The group of ferrites belonging to the Magnetoplumbite family has the general formula $MFe_{12}O_{19}$ where M is the divalent metal like Ba or Sr with other Fe ions in +3 charged states. For example $BaFe_{12}O_{19}$ etc.

SYNTHESIS OF FERRITE NANOMATERIALS

CITRATE PRECURSOR METHOD was used to produce ferrite nanoparticles.

LABORATORY PREPARATION DETAILS

The aqueous solution prepared above are mixed together and stirred at 60°C to 80°C temperature for two hours. Green slurry is formed which is called precursor. Then, this precursor is dried in an oven at a temperature at 100°C. This dried material is the citrate precursor. This citrate precursor is annealed at pre-determined temperatures 450°C, 550°C and 650°C in temperature controlled muffle furnace for two different durations i.e. 1 hour and 2 hours.

The twelve samples prepared at different temperatures are crushed in a crucible and the powdered sample is stored. Then the sample is studied for their full report showing their magnetic properties based on the hysteresis loop formation for the sample prepared at the

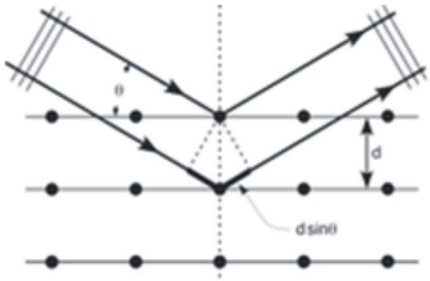
X-RAY DIFFRACTOMETER

X-ray diffractometer (XRD) reveals the arrangement of the constituent atoms of the crystal and this lead to the elucidation of the crystals. It is particularly important for the study of new materials in the laboratory because it tells whether the material is formed in the desired phase or not. The crystal parameters obtained from the XRD pattern tell us about the distortion in the crystal structure such as lattice expansion due to stress etc.

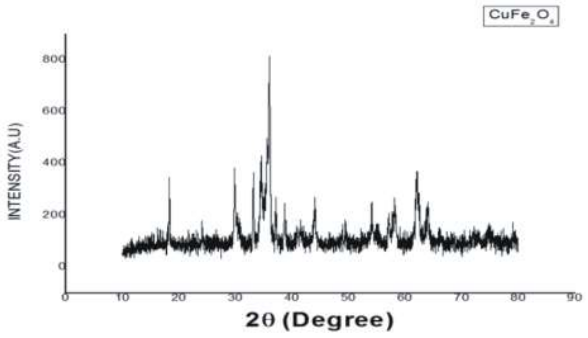
There is a connection between the size of the crystal and the broadening of the peak formed through XRD pattern which can be formulated by Scherer formula given by

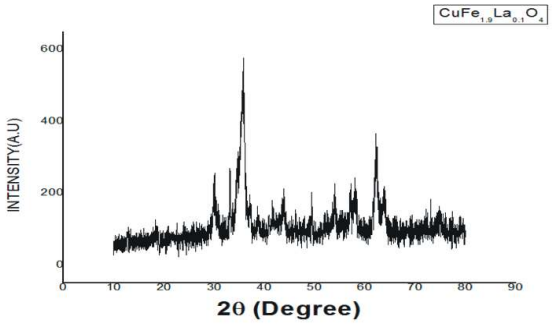
$D=0.9*\lambda/\beta\cos\theta$

Where D is the size of the crystallite.? is the full width at half maxima (FWHM) and ? is the Bragg's angle for a specific peak.



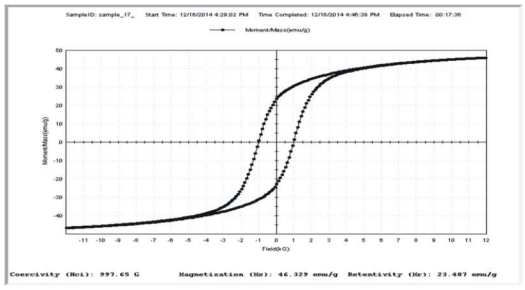
X-ray analysis of crystals :



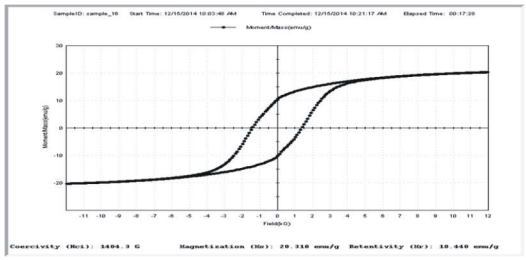


TABLE

Name of ferrite	Crystallite size (nm)	Coercivity (G)	Retentivity (emu/gm)	Magnetization (emu/gm)
$CuFe_2O_4$	12.24	1404.3	10.440	20.310
$Cu(Fe_{0.99}La_{0.01})_2O_4$	7.23	997.65	23.407	46.329



MAGNETIZATION CURVE FOR LA-SUBSTITUTED COPPERFERRITE



MAGNETIZATION CURVE FOR COPPER FERRITE

CONCLUSION

The following conclusions were obtained by interpreting the characterization report:

- Particle size of $CuFe_2O_4$ at 650 degree centigrade is 12.24 nm and is decreases to 7.23 nm when La is substituted to it. Thus, size depends upon substitution
- Magnetic parameters changes as the particle size and composition changes. Coercivity decreases but magnetization and retentivity increases as composition changes from pure to substitute
- By substitution of La in pure ferrite coercivity decreases so its behavior approaches superparamagnetism which is a specialbehavior of magnetic particle atnanoscale.Hence it may be used in recording media, electronics, and communication system components etc

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THE VERIFICATION OF STEFAN'S LAW

Deepa Kumari * Shivani Choudhary * Swaati Sandhya *

ABSTRACT : *In* 1879 *Josef Stefan experimentally observed that the power per unit area of a blackbody is proportional to the fourth power of its absolute temperature. This same relationship was theoretically derived from Maxwell's theory and classical thermodynamics in 1884 by Ludwig Boltzmann and is therefore called the Stefan-Boltzmann law.*

KEYWORDS : Proportional, Temperature, Theoretically

INTRODUCTION

Classical thermodynamics broke down when Lord Rayleigh and Sir James Jeans attempted to use electromagnetism to describe the energy density distribution for a blackbody. Although their theory worked relatively well for low frequencies, it failed when applied to high frequencies; the intensity diverged to infinity! This unfeasible result was dubbed the ultraviolet catastrophe because ultraviolet light was the highest frequency radiation known at the time.[1] In 1900, Max Planck boldly proposed a solution to the problem. By making the ad hoc assumption that atoms behave like electrical oscillators, absorbing and emitting only discrete amounts of energy for a range of frequencies, Planck was able to accurately describe the energy density distribution observed for blackbody radiation. Furthermore, the Stefan -Boltzman law can be independently derived from Planck's equations.[2]

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THEORY

Planck remedied the ultraviolet catastrophe with an energy distribution function now called

PLANCK'S LAW

$$u(\lambda) = \frac{8\pi hc\lambda^{-5}}{e^{hc/\lambda kt-1}} \qquad ...(1)$$

Where u(λ) is the energy density (J/m^3), h is Planck'sconstant (6.626 × 10 $^{-34}$ J·s), c is the speed of light (299, 792, 458 m/s), λ is the wavelength of the radiation(m), k is the Boltzmann constant (1.381 ×10^{-23} J/K), and T is the absolute temperature (K).

The total energy density (U) is obtained by integrating Eq. 1 over all wavelengths.

$$U = \int_0^\infty \frac{8\pi hc\lambda^{-4}}{e^{hc/\lambda kt-1}} d\lambda$$

$$U = \frac{8\pi^5 K^{-4}}{15h^3c^3} T^4 \qquad ...(2)$$

This is the result that Stefan originally observed in 1879; for an ideal blackbody, the radiation per unit area is proportional to fourth power of the absolute temperature:

$$U=\sigma T^4 \quad ...(3)$$

Where σ is a proportionality constant know as Stefan's constant equal to $5.6705\times10^{-8}\left(\frac{W}{m^2K^4}\right)$. Note that U is solely dependent on the temperature [2]. However, the radiation per unit area for nonideal objects is decreased by factors such as surface composition and color. These contribute to a new emmissivity factor, ∈:

$$U=\frac{P}{A_S}=\in \sigma T^4$$

$$P=\in \sigma A_S T^4 \quad ...(4)$$

Where P is the power, As is the surface area of the object (m^2) and ∈ is the unit-less emissivity with a value ≤ 1. Thus, Eq. 4 is the power emitted by an approximate blackbody.

Consider the filament of a lightbulb: an approximate blackbody. For an object in thermal equilibrium, the input power must be equal to the output power. A filament has two sources of power input and output. Power into the filament is provided from the electrical current running through the resistor (Pe) and the radiation absorbed from ambient room temperature (Po). Power out of the filament includes electromagnetic radiation (Pr) and any power lost to conduction (Pc).

$$Pin = Pout$$

$$Pe + Po = Pr + Pc \quad ...(5)$$

Pe can be expressed in terms of the current of the circuit and the potential difference across the filament.

Eq. 4 relates Po and Pr to the absolute ambient temperature (To) and the absolute equilibrium temperature (Tf), respectively. The power lost to conduction (Pc) can also be related to these two temperatures using:

$$Pc = k A_o (T_f - T_o). \quad ...(6)$$

Where k is a thermal conductivity constant dependent on the material $A_o\left(\frac{W}{m.K}\right)$ and A o is a constant dependent on the physical contact with other materials(m).[3] Substituting these equations into Eq. 5 and rearranging to solve for P e gives

$$P_e = IV = \sigma \in A_S T^4_f - \sigma \in A_S T^4_0 + KA_0 (T_f - T_0) \quad ...(7)$$

Where the T^4_f term is the blackbody radiation, the T^4_0 term is the blackbody absorption, and the (T f – To) term is the power lost to conduction.

OBJECTIVES

i) Verification of Stefan's law by electrical method.

ii) Determination of error of Stefan's Law.

iii) Study of the temperature dependence of total radiation and hence to verify the Stefan's law.

VERIFICATION OF STEFAN'S LAW

The phenomenon can be studied using a light bulb filament as the radiating body since it can be easily heated to a very high temperature. The power can be determined from the voltage and current to the filament. The temperature of the filament has to be found indirectly by first computing the electrical resistance and then using a standard resistance-versus-temperature relationship. When an electric current flows through the filament in a light bulb the filament heats up. The filament loses heat in two ways: electromagnetic radiation (mainly visible light and invisible heat radiation) and conduction (through the base of the bulb). The heat conducted away from the filament increases linearly with filament temperature. The air in the bulb is

pumped out during manufacture so no heat is lost by convection. In this trainer we have verified Stefan's law by two methods. Stefan's Law is a basic phenomenon of thermodynamics. With this trainer Stefan's law is verified by electrical method. All bodies lose and gain thermal energy by means of electromagnetic radiation. The rate of energy loss depends on the temperature of the body and the rate of energy gain depends on the temperature of the surroundings. Stefan's Law states that the power radiated by a body is proportional to the 4^{th} power of the absolute temperature. The phenomenon can be studied using a light-bulb electrical method and second one is temperature dependence of total radiation. Stefan-Boltzmann's law is also valid for a so-called "grey" body whose surface shows a wavelength-independent absorption-coefficient of less than one. In the experiment, the "grey" body is represented by the filament of an incandescent lamp whose energy emission is investigated as a function of the temperature.

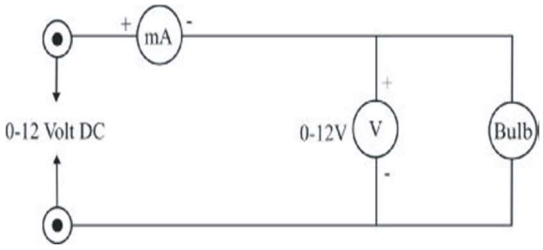
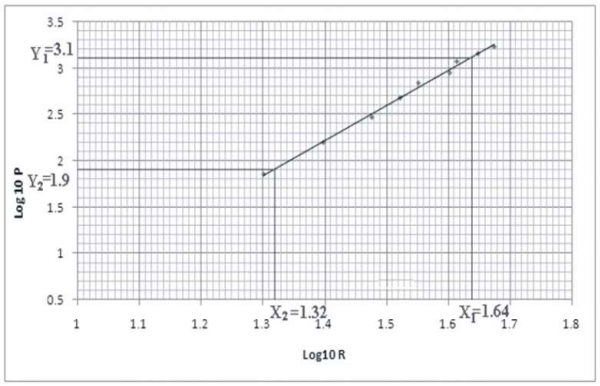


Table : Verification Of Stefan's Law

S. No.	Voltage V (in volt)	Current (in mA)	Current (in A)	Power P = VI (in mW)	Resistance R = V/I (in ohm)	Log $_{10}$ R	Log$_{10}$P
1	1.2	60	0.06	72	20.0	1.301	1.857330
2	2.0	80	0.08	160	25.0	1.397	2.204100
3	3.0	100	0.10	300	30.0	1.477	2.477100
4	4.0	120	0.12	480	33.3	1.522	2.681200
5	5.0	140	0.14	700	35.7	1.552	2.845000
6	6.0	150	0.15	900	40 .0	1.600	2.954200
7	7.0	170	0.17	1190	41.1	1.614	3.075547
8	8.0	180	0.18	1440	44.4	1.647	3.158362
9	9.0	190	0.19	1710	47.3	1.675	3.232990



CALCULATION

Formula for Slope of line as below

Slope = $(Y_1-Y_2)/(X_1-X_2)$

On substituting the values of X_1, $Y_1$and X_2, Y_2 from the above graph we get = (3.1-1.9)/(1.64-1.32)

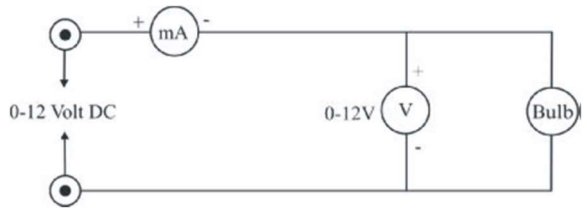
= 1.2/0.32

Calculated value of slope = 3.75

According to the Stefan's law the value of slope should be 4 on calculating the % error using the formula.

Percentage Error = 6.25%.

Study of the temperature dependence of total radiation and hence to verify the Stefan's law.



CALCULATION

Value of current at which the filament just begins to glow Ig = 60mA= 0.06A

Value of voltage at which the filament just begins to glow Vg = 1.2V

So the value of resistance at which the filament just begins to glow is Rg = Vg/Ig.

Rg = 1.2/.06 = 20 Ohm

Value of resistance of the bulb at 0ºC was determined by the formula R_o = Rg/3.26

On putting the value of Rg in above formula we get R_o = 20/3.6 =5.555 Ohm

OBSERVATION TABLE

S. No.	Voltage V (in volt)	Current (in mA)	Current (in A)	Resistance Rt = V/I (in ohm)	Rt /R₀
1	2	80	0.08	25.0	4.50
2	3	100	0.10	30.0	5.40
3	4	120	0.12	33.3	6.00
4	5	140	0.14	35.7	6.42
5	6	150	0.15	40.0	7.20
6	7	170	0.17	41.1	7.41
7	8	180	0.18	44.4	8 .00
8	9	190	0.19	47.3	8.52

For each value of Rt/ R0, the temperature T of the filament of bulb (in Kelvin) was taken from the given table.

Temperature T (in K)	R_t / R_0	Temperature T (in K)	R_t / R_0
273	1.00	1273	6.94
373	1.53	1373	7.60
473	2.07	1473	8.26
573	2.13	1573	8.90
673	3.22	1673	9.70
773	3.80	1773	10.43
873	4.40	1873	11.17
973	5.00	1973	11.42
1073	5.64	2073	12.69
1173	6.37	2173	13.50

To find the values in between the values supplied in the table, the readings were extrapolated by the following formula

$$\mathbf{Y = (x - x_1)y_2 - (x - x_2)y_1 / (x_2 - x_1)}$$

Where,

y = Extrapolated value of temperature which is to be found

x = The value of Rt/R_o at which value of temperature is to be found

x_1 = The value of Rt/R_o just less than x (from the table)

x_2 = The value of Rt/R0 just greater than x (from the table)

y_1 = The value of temperature at x1 (from the table)

y_2 = The value of temperature at x2 (from the table)

CALCULATION

If the value of temperature (y) is to be found for Rt/R0 = 4.5(x)

Then from the above table

$x_1 = 4.4$

$x_2 = 5$

$y_1 = 873$

$y_2 = 973$

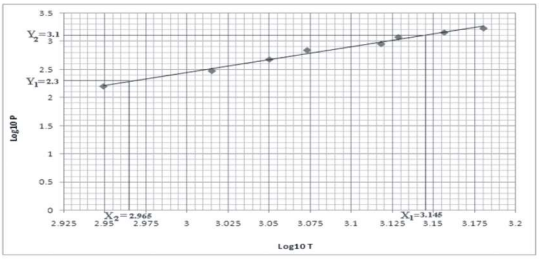
y = 889.6 K

Thus for the value of Rt/R0 = 4.5

The corresponding value of temperature of filament is 889.6

Similarly calculating the value of temperature corresponding to all values of Rt/R0 putting the values in observation table we get,

S. No.	Voltage V (in volt)	Current (in mA)	P=VI (in mW)	R_t/R_0	Temperature T (in K) for each value of R_g/R_0	Log_{10} P	Log_{10}T
1	2	80	160	4.50	889.667	2.20412	2.94900
2	3	100	300	5.40	1035.50	2.47710	3.01510
3	4	120	480	6.00	1122.31	2.68124	3.05010
4	5	140	700	6.42	1183.27	2.84500	3.07300
5	6	150	900	7.20	1312.39	2.94500	3.11800
6	7	170	1190	7.41	1344.48	3.07550	3.12855
7	8	180	1440	8.00	1433.60	3.15800	3.15640
8	9	190	1710	8.52	1514.61	3.23200	3.18030



RESULTS

Calculated value of slope =4.444

According to the Stefan's law the value of slope should be 4

Percentage error = 11%.

CONCLUSION

The first method used a log- plot of the power versus resistance and determined the slope to be 3.75 and from the second method we determined the temperature of the filament to be 889.6K for the value of R_t/R_0 = 4.5 and also determined the slope of a straight line between log-plot of input power as a function of temperature which is 4.

Thermal expansion would increase the surface area as the filament's temperature increasesd. This in turn would cause the curve to become more steep. The effect, however, appears slight. In addition, the temperature of the glass bulb is not the same as the room temperature. The bulb's temperature increases as it is turned on and off. This in turn will make the absorption term in

$P = VI = \sigma\varepsilon A_S T_f^4 - \sigma\varepsilon A_s T_O^4 + K A (T_f - T_o)$

a larger factor. Nonetheless, the increased room temperature would have a minimal effect on $P = VI = \sigma\varepsilon A_S T_f^4 - \sigma\varepsilon A_s T_O^4 + KA (T_f - T_o)$ for large values of Tf and can therefore be considered negligible.

The quality of the fits for both methods, the agreement of the exponent in the second method, and the correspondence of the two values of the constant creates a strong argument for the support of Stefan-Boltzmann's law.

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VERIFICATION OF PLANCK'S LAW

Khushboo Kumari * Kritika Raj * Deep Mala * Shristi *

ABSTRACT : *The Planck's constant (denoted h, also called Planck's constant) is a physical constant that is the quantum of action in quantum mechanics. Published in 1900, it originally described as the proportionality constant between the energy (E) of a charged atomic oscillator in the wall of a black body, and the frequency (ν) of its associated electromagnetic wave.*

KEYWORDS : Physical Constant, Proportionality

INTRODUCTION

Its relevance is now integral to the field of quantum mechanics, describing the relationship between energy and frequency, commonly known as the Planck relation :

$$E = h\nu$$

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In 1905 the value (E), the energy of a charged atomic oscillator, was theoretically associated with the energy of the electromagnetic wave itself, representing the minimum amount of energy required to form an electromagnetic field (a "quantum"). Further investigation of quanta revealed behaviour associated with an independent unit ("particle") as opposed to an electromagnetic wave and was eventually given the term photon. The Planck relation now describes the energy of each photon in terms of the photon's frequency. This energy is extremely small in terms of ordinary experience.

Since the frequency ν, wavelength λ, and speed of light c are related by $\lambda\nu = c$, the Planck relation for a photon can also be expressed as

$$E = \frac{hc}{\lambda}$$

DETERMINATION OF PLANCK'S CONSTANT

Planck's constant can be determined using LED, which illustrate the basic concept of the Quantum Mechanics. It helps to understand the phenomena of photon, its energy, its frequency etc. It is mainly used to determine the fundamental constant of Quantum Mechanics called Planck's constant.

The device used consisted of five LEDs of different colour which are Blue, Green, yellow, Orange and Red, this trainer can be also used to calculate the energy of photon.

Planck's constant relates the energy of light photons to their frequency. It also shows up in De Broglie's relation for the wavelength of matter waves and Schrödinger's Equations. An LED begins to emit light when the voltage applied to it creates a large enough energy difference between the two electronic states in the parts of the diode for an electron transition to release one quantum of light at the wavelength of the LED. Diodes today come in a variety of colours. Each colour is achieved by having a slightly different semiconductor material.

OBJECTIVES

- Determination of Planck's constant using light emitting diode (LED)
- Calculation of the error, the percent error of Planck's constant
- To study the V-I characteristics for light emitting diode (LED)

METHODOLOGY

Determination Of Planck's Constant Using Light Emitting Diode(LED)

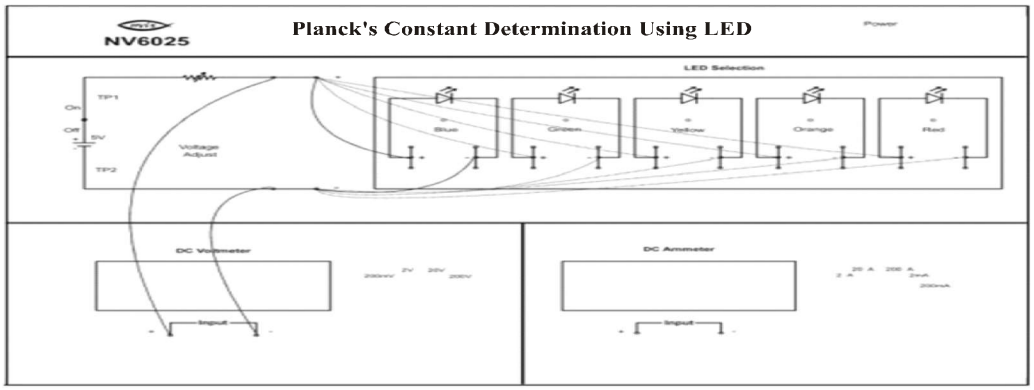


TABLE: DETERMINATION OF PLANCK'S CONSTANT

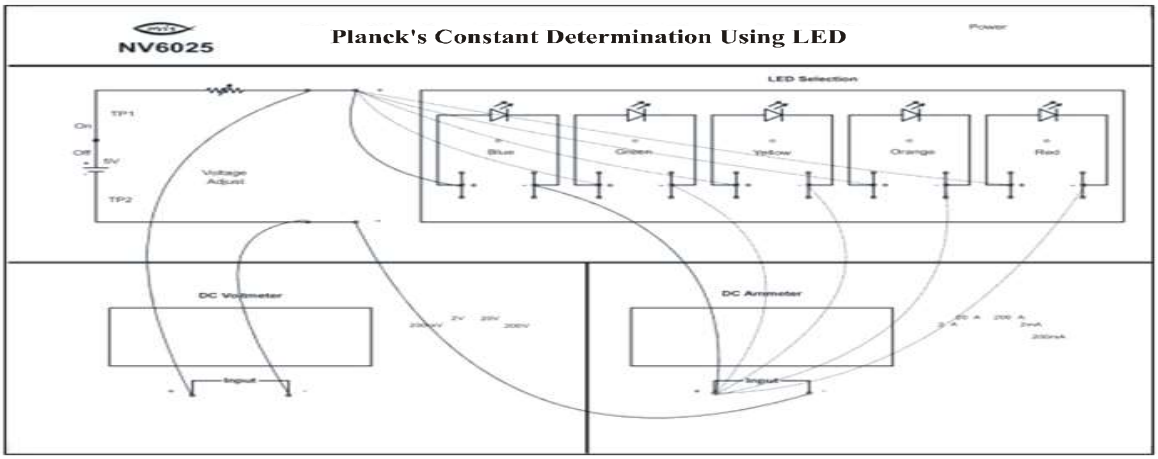
S. No.	Colour(LED)	Wavelength λ(nm)	Breakdown voltage Vo(V)	Planck's constant 'h'. Js
1	Blue	700	2.49	6.24
2	Green	630	2.30	6.86
3	Yellow	580	2.04	6.31
4	Orange	470	1.89	6.35
5	Red	560	1.72	6.42

The value of Planck's constant 'h' was calculated for different LEDs and its mean was found to be6.436×10^{-34} Js.

The error of the Planck's constant was found to be0.194×10^{-34} Js.

The percent error was found to be 2.926%.

To Draw the V-I characteristic for Light Emitting Diode (LED) and determine the value of Planck's constant:



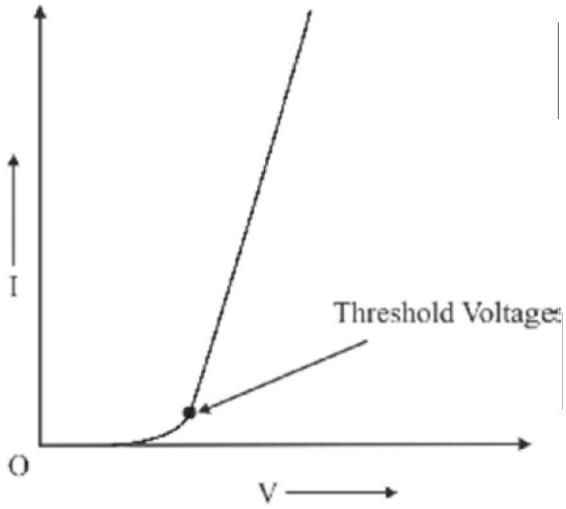
RESULTS AND DISCUSSION

TABLE : FOR BLUE LIGHT

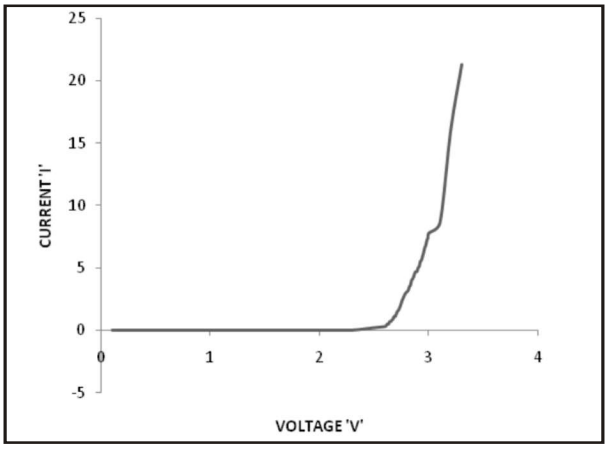
S. No.	Voltage 'v' (V)	Current 'I' (mA)
1	2	0
2	2.05	0
3	2.10	0
4	2.15	0
5	2.20	0
6	2.25	0
7	2.30	0
8	2.35	0
9	2.40	0.1
10	2.45	0.1
11	2.50	0.2
12	2.55	0.2
13	2.60	0.3

TABLE : FOR BLUE LIGHT

S. No.	Voltage 'v' (V)	Current 'I' (mA)
14	2.65	0.7
15	2.70	1.1
16	2.75	1.8
17	2.80	2.9
18	2.85	3.6
19	2.90	5.0
20	2.95	6.2
21	3.00	7.8
22	3.05	7.9
23	3.10	8.6
24	3.15	12.1
25	3.20	16.1
26	3.25	18.2
27	3.30	21.3



V-I CHARACTERISTIC CURVE



The breakdown voltage of blue light from the graph was noted as 2.40V

Similar curves were obtained for green, yellow, orange and red lights

CONCLUSION

The resulting law states that the energy of each quantum is equal to the frequency of the radiation multiplied by the universal constant h:

$$E = f \times h$$

Where, f is frequency of the emitted photons and h is called the Planck's constant

The value of Planck's constant 'h' was calculated for different LEDs and its mean was found to be 6.436×10^{-34} Js.

The error of the Planck's constant was found to be 0.194×10^{-34} Js.

The percent error was found to be 2.926%.

The V-I characteristic for different colour LEDs light was also studied using the same apparatus

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HISTORY

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वैशाली – एक परिचय

कुमारी तुलिका * लाली श्रीवास्तव *

सारांश : *वैशाली अपनी गौरवशाली परंपराओं, विशिष्ट रीति–रिवाजों, समृद्ध संस्कृति, ऐतिहासिक विरासतों, त्योहारो एंवं रमणिक प्रकृतिक संपदाओं के लिए विश्व प्रसिद्ध रहा हैं। आज वैशाली के महत्त्वपूर्ण तथ्य से अवगत कराने का श्रेय पटना विश्वविद्यालय के भूतपूर्व अध्यक्ष स्वर्गीय डॉ0 योगन्द्र मिश्रजी को जाता है। पहले यह माना जाता था कि रोमन गणतंत्र ही पहला व प्राचीनतम गणतंत्र है। लेकिन योगेन्द्र मिश्र द्वारा इस बात का प्रमाण देते हुए कहा गया है कि वैशाली गणतंत्र पहला और प्राचीनतम गणतंत्र है जिसकी स्थापना 725ई०पू० हुई ,जबकि रोमन गणतंत्र की स्थापना 600ई० पूर्व में हुई थी। इसलिए विश्व को सर्वप्रथम गणतंत्र का ज्ञान कराने वाला स्थान वैशाली ही है! वैशाली से संबधित मुख्य तथ्य की जानकारी हमें वैशाली में हुए समय–समय पर उत्खनन तथा विभिन्न पुस्तकों से मिलती है।*

शब्द कुंजी: रमणिक, उत्खनन, विरासत, गौरवशाली

परिचय

वैशाली बिहार प्रांत के वैशाली जिला में स्थित एक ऐतिहासिक स्थल है, जिसके अवशेष वर्तमान वैशाली जिला के बसा नामक गाँव में पाया गया है। वैशाली की वज्जिका तथा हिन्दी यहाँ की मुख्य भाषाएँ हैं। रामायण एवं पुराणों के अनुसार आदि काल में वैशाली में राजतंत्रीय शासन प्रणाली था। किस प्रकार यहाँ राजतंत्र का अंत हुआ और प्रजातंत्र स्थापित हुआ इस संबंध में प्राचीन इतिहास बिल्कुल मौन है।

गुप्त सम्राज्य के अधीन यह एक प्रांतीय राजधानी थी। उद्योग व व्यापार का प्रमुख केन्द्र था। यहाँ मुगल शासक बाबर और अकबर के सैनिक अभियान भी हुए।

वैशाली गणतंत्र की न्याय प्रणाली आज भी अनुकरणीय है। वहाँ अपराधी को सात स्तर के न्यायलयों से होकर गुजरना पड़ता था। वह जिस स्तर पर निर्दोष पाया जाता था उसे वही मुक्त कर दिया जाता था अन्यथा उसे ऊपर के न्ययालयों में भेज दिया जाता था। जहाँ उसे कानून सहिंता के अनुसार दंड दिया जाता था। इस न्याय व्यवस्था की दो विशेषताएं थी। पहला कि अपराधी को कम समय में न्याय मिल जाता था और दूसरा निर्दोष व्यक्ति को दंडित नहीं किया जाता था। ठीक इसके विपरीत है आज की न्याय व्यवस्था काफी जटिल है। जटिल होने के कारण किसी व्यक्ति को न्याय पाने में वर्षों लग जाते हैं, कभी–कभी तो मृत्यु भी हो जाती है। गौरतलब है कि प्रजातंत्र की सबसे बड़ी विशेषता होती है व्यक्ति के अधिकारों की हर कीमत पर रक्षा और इस मामले में हम पाते हैं कि वैशाली की न्याय व्यवस्था अत्यंत उच्चकोटि की थी।

वैशाली की गरिमा इस बात से भी है कि यह भगवान महावीर की जन्मभूमि तथा भगवान बुद्ध की कर्मभूमि रही है। भगवान बुद्ध ने अपना पंचम तथा अंतिम उपदेश वैशाली में दिया था। वैशाली जैन धर्मावलंबियों के लिए भी पवित्र तीर्थस्थल है। इसकी नींव 23 अप्रैल 1956 को भारत के प्रथम राष्ट्रपति डॉ. राजेन्द्र प्रसाद द्वारा डाली गई थी।

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वैशाली में ही नृत्य सुंदरी अम्रपाली का जन्म हुआ। आगे चलकर वह भिक्षुणी संघ में शामिल हो गई। वैशाली में प्रथा थी कि सबसे सुंदर लड़की को गणिका चुना जाता था। गौतम बुद्ध के समय वैशाली की गणिका अम्रपाली थी। वह अत्यंत रुपवती थी। उसे समाज में सम्मानीय स्थान प्राप्त था। बिम्बिसार जैसे शासक भी उससे प्रेम करते थे। जिसके फलस्वरुप अम्रपाली को अभय नाम का एक पुत्र भी हुआ। जब वह पाँच वर्ष का हुआ तब अम्रपाली ने उसे बिम्बिसार के पास भेज दिय। वह बालक बड़ा निर्भीक एवं निडर था। आगे चलकर अम्रपाली गौतम बुद्ध के उपदेशों से प्रभावित हुई तथा बौद्ध धर्म ग्रहण कर संन्यासनी का जीवन व्यतीत करने लगी।

प्राचीन ऐतिहासिक पर्यटन में दिलचस्पी रखने वाले लोगों के लिए वैशाली एक महत्त्वपूर्ण पर्यटन स्थल है। यहाँ के मुख्य दर्शनीय स्थलों में अशोक स्तंभ, राजा विशाल का गढ, बौद्ध स्तूप, अभिषेक पुष्करिणी, विश्व शांति स्तूप, वैशाली संग्रहालय आदि प्रमुख हैं।

भगवान बुद्ध का महापरिनिर्वाण होने के पश्चात् उनके शरीरावशेषों का एक भाग वैशाली के लिच्छवियों को मिला जिसका पता 1958 के खुदाई के दौरान चला। इस स्थान के उत्खनन का श्रेय काशी प्रसाद जयसवाल तथा तत्कालीन निदेशक डॉ0 अनन्त सदाशिव अल्टेकर को जाता है। महान् सम्राट अशोक ने सिंह स्तंभ का निर्माण करवाया था। इसे भीमसेन की लाठी के नाम से भी जाना जाता है। अभिषेक पुष्करणी एक पवित्र सरोवर है। कहा जाता है कि प्रत्येक राजा का अभिषेक पुष्करणी के जल से होता था। जनकल्याण की भावनाओं को ध्यान में रखते हुए 'फुजिई गुरुजी' की प्रेरणा से यहाँ विश्व का 71वाँ सबसे ऊँचा स्तूप 1983 ई0 में बनाया गया, जिसे विश्व शांति स्तूप कहा जाता है। इसका गोल घुमावदार गुंबद, अंलकृत सीढ़ियाँ और ध्यानमग्न बुद्ध की भिन्न–भिन्न मुद्राओं की प्रतिमाएँ ओजस्विता की चमक से भरी दिखाई देती हैं। वैशाली में स्थित प्राचीन गढ़ 'राजा विशाल का गढ़' के नाम से प्रसिद्ध है जिसकी परिधि लगभग एक कि0मी0 है। वैशाली संग्रहालय1971 में 'भारतीय पुरातत्व सर्वेक्षण' द्वारा स्थापित किया गया। इसमें वैशाली के इतिहास से संबंधित 2000 पुरावशेषों को प्रदर्शन के लिए रखा गया है।

इस प्रकार हाजीपुर से 37 कि0मी0 दूर मुजफरपुर जिला स्थित वैशाली वास्तव में बिहार के गौरव का ऐतिहासिक प्रतीक है।

परंतु आज आधुनिकीकरण के दौर में सरकार द्वारा प्राचीन ऐतिहासिक विरासतों के संरक्षण पर विशेष ध्यान नहीं दिया जा रहा है, जिसकी वजह से इन स्मारकों का सौन्दर्यीकरण धीरे–धीरे धूमिल होता जा रहा है। इस कारणवश बिहार का प्राचीन ऐतिहासिक स्थल वैशाली खंडहर में परिवर्तित होता जा रहा है और इसकी भव्यता नष्ट होने के पथ पर अग्रसर है। वैशाली का विशेष दर्शनीय स्थल अभिषेक पुष्करणी तो लगभग खंडहर सा ही प्रतीत होने लगा है।

शोध निष्कर्ष के आधार पर यह कहा जा सकता है कि हमें सामूहिक रूप से वैशाली के गौरव को सुरक्षित एवं स्वच्छ रखने का प्रयास करना चाहिए, और इसके सौन्दर्यीकरण को बनाए रखने की भी कोशिश करनी चाहिए, क्योंकि इसका संरक्षण बिहार के गौरव को बनाये रखने के लिए अपेक्षित है।

संदर्भ सूची

- वैशाली दिग्दर्शन– डॉ0 योगेन्द्र मिश्र व जगदीश चन्द्र माथुर
- वैशाली पथ प्रदर्शिका– डॉ0 योगेन्द्र मिश्र
- पुरातत्व की दृष्टि में वैशाली– विजय कांत मिश्र व जगदीश चन्द्र माथुर
- वैशाली महोत्सव के पचास वर्ष– डॉ0 जयश्री मिश्र (पृष्ठ सं0:– 8–15)
- विश्व का प्रथम गणतंत्र वैशाली– डॉ0 जयश्री मिश्र
- वैशाली के प्राचीन इतिहास– डॉ0 योगेन्द्र मिश्र प्रकाशन : मोतीलाल बनारसीदास {नई दिल्ली}
- वैशाली अभिनन्दन ग्रन्थ– डॉ0 योगेन्द्र मिश्र

उपरोक्त पुस्तकें बिहार विभाजन के शताब्दी वर्ष के अवसर पर बिहार विधानसभा द्वारा प्रकासित की गई हैं।

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HISTORY

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छत्रपति शिवाजी राजे भोंसले : भारतीय इतिहास का असाधारण व्यक्तित्व

अपूर्वा संजीवनी * जयश्री मिश्रा *

सारांश : भारतीय इतिहास में शिवाजी का अत्यंत महत्त्वपूर्ण स्थान है। आधुनिक इतिहासकारों का मानना है की 18वीं शताब्दी में जो मराठा प्रभुत्व अटक से कटक तक फैला हुआ था, स्वराज के रूप में उसकी स्थापना शिवाजी ने 17 वीं सदी के उत्तरार्ध में की थी। शिवाजी ने महाराष्ट्र में स्वतंत्र राज्य की स्थापना की थी। शिवाजी के कारण मराठाओं का नाम इतिहास में स्वर्णक्षरों में लिखा गया। इनके द्वारा मराठा शक्ति की जड़ें इतनी मजबूत कर दी थी कि वो मुगलों के साथ-साथ अंग्रेजों का भी मुकाबला कर सकें। यहाँ तक की प्रथम व द्वितीय मराठा युद्ध में अंग्रेजों को परास्त कर उन्होंने अपनी शर्तों पर संधि करने के लिए बाध्य कर दिया।

शब्द कुंजी: मराठा प्रभुत्व, कुशल कूटनीतिज्ञ महान् योद्धा, असाधारण नेतृत्व क्षमता, अनुकरणीय व्यक्तित्व

परिचय

इतिहास के इस असाधारण व्यक्तित्व का जन्म 20 अप्रैल, 1627 ई० को जुन्नर के निकट शिवनेर दुर्ग में जीजबाई के गर्भ से हुआ था। इनके पिता का नाम शाहजी भोंसले था। शिवाजी की शिक्षा-दीक्षा दादा कोणदेव नमक ब्राह्मण और माँ जीजबाई की देख-रेख में हुआ। इन दोनों के अतिरिक्त आध्यात्मिक गुरु रामदास का भी इनपर गहरा प्रभाव पड़ा। इन्होंने ही शिवाजी के कानों में देशप्रेम का महामंत्र फूँका था।

शिवाजी ने पूरा की जागीर से स्वतंत्र रूप से कार्य करना प्रारंभ किया। इनके प्रारंभिक कार्यकलापों का केन्द्र मालवा प्रदेश रहा। यहाँ के कोली और मराठा जाति के लोग, जो अत्यंत कुशल योद्धा माने जाते थे को शिवाजी ने संगठित कर दुर्ग का निर्माण किया और एक के बाद एक दुर्गों को जीतना शुरू किया। मालवाओं का सहयोग शिवाजी के लिए उतना ही महत्त्वपूर्ण सिद्ध हुआ जितना शेरशाह सूरी के लिए आफगानों का साथ। शिवाजी ने सर्वप्रथम 1644 ई० में सिंहगढ़ के दुर्गों पर अपना अधिकार स्थापित किया। इसके बाद तोरण, चाकन, कोडना और पुरन्दर के दुर्गो पर एक के बाद एक अधिकार स्थापित किया। बीजापुर सुल्तान ने क्रोधित होकर इन्हें सबक सीखने के उद्देश्य से शाहजी को बंदी बना लिया और पिता की रिहाई के लिए शिवाजी को शांति समझौता करना पड़ा।

परंतु 6 वर्ष बाद शिवाजी ने पुनः आक्रमानात्मक नीति अपनाई और 1655 ई० में जावली के किले पर अधिकार कर लिया। इसी समय बीजापुर में इनकी औरंगजेब से भी मुठभेड़ हुई। इसके पश्चात् शिवाजी ने द० कोंकण पर अधिकार किया। इसी क्रम में कल्याण, भिवंडी, चोल, टोना आदि पर भी अपना अधिकार स्थापित किया। इन्होंने

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पुर्तगालियों को वार्षिक दर देने के लिए विवश कर दिया। इस समय तक शिवाजी प० दुर्गो के स्वामी बन चुके थे।

शिवाजी की बढ़ती हुई शक्ति पर अंकुश लगाने के लिए बीजापुर सुल्तान की संरक्षिका बड़ी साहिबा ने सरदार अफजल खान को 1659 ई० में शिवाजी को छल-बल से परास्त करने भेजा, क्योंकि उस समय सीधे युद्ध में उन्हें परास्त करना नामुकिन माना जाता था। परंतु अफजल खान के नापाक इरादों का पता उन्हें पहले ही चल गया। अत: संधि वार्ता के दरम्यान बातों में उलझाकर अफजल खान ने जब शिवाजी को मारने की कोशिश की तो शिवाजी ने वार कर उसका वध कर दिया।

शिवाजी के दमन के लिए औरंगजेब ने अपने मामा शाइस्ता खान को 1660 ई० ग० का सूबेदार बनाकर भेजा। दोनों के बीच 2 वर्षों तक युद्ध चला। अंत में शाइस्ता खान को अपनी जान बचाकर भागना पड़ा और शिवाजी विजयी हुए।

शिवाजी ने 1644 ई० में सूरत पर आक्रमण कर वहाँ के धनाढ्य व्यापारियों को लूटा और फिर लौट गये। इस घटना का जिक्र अंग्रेजों ने अपने लेखों में किया है। सूरत की लूट से खिन्न औरंगजेब द्वारा वहाँ उप-सेनापति के रुप में राजा जयसिंह की नियुक्ति की गई। लेकिन शिवाजी ने जयसिंह के साथ पुरन्दर की संधि कर ली जिसमें तय हुआ कि शिवाजी मुगल राज्य के प्रति राजभक्ति कायम रखेंगें और मुगल भी दक्षिण के युद्ध में उन्हें सहयता देंगे।

राजा जयसिंह ने उन्हें आगरा आने का आमंत्रण दिया। शिवाजी भी आगरा जाकर औरंगजेब की वास्तविक स्थिति को समझना चाहते थे, किन्तु जब वे मुगल दरबार गये तो उन्हें छोटे सरदारों की श्रेणी में खड़ा कर दिया गया। इससे क्रोधित होकर जब उन्होनें खुले दरबार में औरंगजेब का अपमान कर दिया तो औरंगजेब द्वारा उन्हें नजरबंद करवा दिया गया और उन्हें मारने की साजिश होने लगी। इस षड्यंत्र का पता चलते ही शिवाजी बड़ी चतुराई के साथ मिठाई की टोकरी में छिपते हुए भाग निकले। 1666 ई० में महाराष्ट्र पहुँच कर शिवाजी ने अपनी शक्ति बढ़ानी शुरू कर दी।

1674 ई० तक शिवाजी महाराज की शक्ति का विस्तार हो चुका था और प० महाराष्ट्र में एक स्वतंत्र हिन्दू राष्ट्र की स्थापना हो चुकी थी। रायगढ़ के किले में एक बड़े समारोह में हिन्दू शास्त्र विधि से शिवाजी ने अपना राज्याभिषेक करवाया और 'छत्रपति' की उपाधि धारण की। भगवा ध्वज को अपना झंडा बनाया तथा अपने नाम का सिक्का भी चलाया। संधियाँ अब कानूनी दृष्टि से मान्य हो गई और हिन्दुओं को मुगल दरबार में भी मान्यता प्राप्त हुई।

राज्याभिषेक पर हुए खर्च से राजकोष रिक्त हो गया था। अत: रिक्त राजकोष को भरने के लिए उन्होनें कोल्हापुर, गोलकुंडा, बीजापुर और द० के राज्यों को लूटा। किन्तु इसी बीच अप्रैल 1680 ई० में हिन्दू धर्म के इस महान रक्षक की मृत्यु हो गयी और इनके पुत्र शंभाजी को उत्तराधिकार मिला।

शिवाजी महाराज मध्यकालीन इतिहास में एक अच्छे साम्राज्य निर्माता के रूप में भी जाने जाते हैं, जिनकी शासन व्यवस्था के केन्द्र में न्यायपालिका, कार्यपालिका तथा सैन्य व्यवस्था थी।

इसके अतिरिक्त उन्होंने 'अष्टप्रधान मंत्रिमंडल' की भी स्थापना की। प्रांतीय शासन में सुविधा हेतु उनके द्वारा प्रांतों को उत्तरी भाग, गक्शिणी प्रांत तथा दक्षिण पूर्वी प्रांत में बाँटा गया। प्रांतों को परगनाओं में विभक्त किया गया। शिवाजी की सेना का स्वरूप राष्ट्रीय था और 'छापामार युद्ध पद्धति' में इनकी सेना सिद्धहस्त थी। सेना में अनुशासन की कड़ी व्यवस्था थी। इनके शासनकाल में आय के प्रमुख स्रोत भूमिकर (2/5), चौथ व सरदेशमुख थे।

इस प्रकार, शिवाजी भारतीय इतिहास के ऐसे महान व्यक्तित्व हुए जिन्होंने न केवल मराठाओं का नाम इतिहास में स्वर्णाक्षरों में अंकित कराया बल्कि ऐसे समय में एक हिन्दू राज्य का निर्माण किया जब औरंगजेब की शक्ति अपने चरम सीमा पर थी।

शिवाजी में साहस और शौर्य कूट-कूट कर भरा था। अफजल खान से भेट करने जाना, मुगल दरबार में जाना आदि ऐसी घटनाएँ हैं जो सिद्ध करती हैं कि वे अपने जीवन को खतरे में डालने से कभी नहीं डरे। शिवाजी में अद्वितीय नेतृत्व क्षमता थी। इसके साथ ही वे मानवीय गुणों से परिपूर्ण एक धनी चरित्र के व्यक्ति थे। मानवियता, सहिष्णुता, दृढ़ निश्चय आदि गुण उनके चरित्र में समाहित थे।

निष्कर्ष एवं सुझाव : शिवाजी एक महान विजेता, कुशल व प्रबुद्ध सम्राट के साथ-साथ एक अच्छे कूटनीतिज्ञ भी थे। कई जगहों पर सीधे युद्ध लड़ने के बजाए वो कूटनीति से का प्रयोग करते थे और यही कूटनीति बड़े से बड़े शत्रुओं को मात देने में उनका साथ देती रही। शिवाजी के जीवन और चरित्र से न केवल दृढ़ निश्चय के गुण को अपनाने की सिख मिलती है, बल्कि उनकी देशभक्ति आज भी अनुकरणीय और प्रासंगिक है। जिस तरह शिवाजी ने मराठाओं को एकता-सूत्र में बांधा उससे यह सीख मिलती है कि यदि भारत की अखंडता को बरकरार रखना है तो इसी तरह संपूर्ण भारतवासियों को एकता के सूत्र में बँधकर रहना होगा।

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किशोरियों में रजोदर्शन के प्रति ज्ञान, मनोवृत्ति तथा व्यवहार का अध्ययन

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सारांश : *रजोदर्शन युवतियों में मासिक चक्र की शुरूआत होने की प्रथम अभिव्यक्ति है। यह किशोरावस्था (10–14) वर्ष के बीच शुरू हो जाता है। रजोदर्शन एक सामान्य शारीरिक प्रक्रिया है परन्तु कई बार ऐसा देखा गया है कि किशोरियाँ ज्ञान तथा जागरूकता के अभाव में इसे सामाजिक संकोच का विषय मानती है, जिससे उनका सम्पूर्ण स्वास्थ्य प्रभावित होता है। पटना के प्रमुख बालिका विद्यालयों यथा–बाँकीपुर गर्ल्स हाई स्कूल, नोट्रेडम अकादमी, संत जोसेफ कान्वेंट, माउंट कार्मल स्कूल की छात्राओं का 25–25 के अनुपात में 100 छात्राओं का चयन करके उन्हें प्रस्तुत शोध का विषय बनाया गया है। शोध का मुख्य उद्देश्य वर्तमान समय में किशोरियों में रजोदर्शन संबंधी ज्ञान, मनोवृत्ति तथा व्यवहार का अध्ययन करना है। अपने अध्ययन–क्रम में शोधकताओं ने यह पाया कि शिक्षा के माध्यम से किशोरियों में रजोदर्शन संबंधी ज्ञान में वृद्धि हुई है जो कि एक सुखद अनुभूति है, लेकिन, शोध कार्य के दौरान यह भी जानकारी हुई कि किशोरियों में रजोदर्शन संबंधी पूर्ण सकारात्मक दृष्टिकोण का अभाव पाया जाता है, जिसका कशोरियों के सम्पूर्ण स्वास्थ्य पर गंभीर प्रभाव पड़ रहा है*

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परिचय

रजोदर्शन का होना एक सामान्य शारीरिक प्रक्रिया है। जब कोई किशोरी यौवनावस्था में प्रवेश करती है तो उसका अण्डाशय हर महीने विकसित डिम्ब (अण्डा) उत्पन्न करना शुरू कर देता है। यह अण्डा फैलोपियन ट्यूब के द्वारा गर्भाशय में पहुँच कर एक सतह का निर्माण करता है जो कि तीन परतों में विभाजित होता है। यदि इस सतह का सम्मिलन पुरूष के शुक्राणु के साथ नहीं होता है तो यह स्त्राव बनकर योनि मार्ग के रास्ते बह जाता है। यदि यह पहली बार हो तो उसे रजोदर्शन कहते हैं। इसके नियमित होने पर इसे मासिक चक्र कहा जाता है। एक महिला अपने सम्पूर्ण जीवनकाल में 400 बार मासिक धर्म से गुजरती है और उन्हें लगभग 67 सप्ताह तक मासिक धर्म रहता है।

किशोरियों में रजोदर्शन से पूर्व रजोदर्शन के सम्बन्ध में सम्पूर्ण ज्ञान का होना अति आवश्यक है, जिससे वह रजोदर्शन संबंधी व्यवहार का प्रबंधन कुशलतापूर्वक कर सकेंगी।

साहित्य समीक्षा : कई शोधकर्ताओं द्वारा रजोदर्शन संबंधी किशोरियों के ज्ञान तथा व्यवहार का पता लगाया गया है।

'ग्लोबल जर्नल ऑफ मेडिसीन एंड पब्लिक हेल्थ, 2012' में डी. लेना तथा चन्द्रशेखर द्वारा ग्रामीण

रजोदर्शन सभी स्वस्थ किशोरी में होने वाली सामान्य शारीरिक प्रक्रिया है। अतः यह आवश्यक है कि सभी किशोरियों को रजोदर्शन का सम्पूर्ण ज्ञान हो तथा रजोदर्शन के प्रति सकारात्मक दृष्टिकोण भी हो ताकि वे रजोदर्शन को संकोच का विषय मानने की बजाय एक सामान्य शारीरिक प्रक्रिया माने।

सरकारी विद्यालयों में किशोरियों का रजोदर्शन संबंधी ज्ञान तथा व्यवहार पर शोध किया गया है, जिसमें यह पाया गया है कि किशोरियों में मासिक धर्म संबंधी ज्ञान तथा इस अवधि में स्वच्छता संबंधी ज्ञान का काफी अभाव है।

इसी प्रकार विकास अध्ययन के लिए ग्रेजुएट स्कूल युगांडा द्वारा **'NALVBEGA FATOMA MATOVO, 2011'** ने अपने अध्ययन 'मासिक धर्म दूविधा' में पाया कि किशोरियाँ इस प्रक्रिया को शर्मनाक तथा भावनात्मक आघात मानती हैं तथा इस दौरान छुआछूत को भी मानती हैं।

'गुम्मट ऑनलाइन लाइब्रेरी, 2015' में 'रजोदर्शन हेतु अपनी बेटी की तैयारी' नामक लेख में 'मोरनी तोमर' ने बताया है कि माता–पिता को रजोदर्शन से पूर्व अपनी बेटी को मासिक धर्म का सम्पूर्ण ज्ञान देना चाहिए तथा उन्हें भावनात्मक सहयोग देना चाहिए, जिससे किशोरियों में भी रजोदर्शन संबंधी सकारात्मक दृष्टिकोण उत्पन्न होगा।

इसी प्रकार समाज में भी रजोदर्शन संबंधी सकारात्मक दृष्टिकोण लाने हेतु **'बिल एण्ड मेलिंडा गेट्स फाउण्डेशन,** 2011' द्वारा 'मासिक धर्म स्वच्छता हेतु निहितार्थ' नामक अध्ययन में मासिक धर्म संबंधी कुरूतियों को दूर करने हेतु स्कूली पाठ्यक्रम में यौन शिक्षा को शामिल करने कि वकालत की गई है।

मासिक चक्र के दौरान निकलने वाले रक्त में ग्रंथियों से निकली अशुद्धियाँ होती है। ऐसे में अच्छी तरह साफ–सफाई नहीं होने से कई तरह के संक्रामक रोग होने का खतरा रहता है। अतः मासिक चक्र की अवधि में शरीर को स्वस्थ रखने एवं स्वच्छता हेतु यह आवश्यक है कि 'सेनेट्री पैड' का इस्तेमाल किया जाए। यदि कपड़ा इस्तेमाल किया गया हो तो उसे धोकर, सुखाकर निःसंक्रमित करने के पश्चात् प्रयोग करें।

उपरोक्त अध्ययनों के आलोक में यह कहा जा सकता है कि रजोदर्शन एक ऐसी प्रक्रिया है जिससे हर नारी को अपने जीवनकाल के दौरान गुजरना पड़ता है। अतः इसके बारे में सम्पूर्ण जानकारी तथा सकारात्मक दृष्टिकोण का होना अति आवश्यक है।

उद्देश्य

i) किशोरियों में रजोदर्शन संबंधी ज्ञान का पता लगाना।
ii) रजोदर्शन के संबंध में किशोरियों के दृष्टिकोण का पता लगाना।
iii) किशोरियों में रजोदर्शन संबंधी मनोवृत्ति का पता लगाना।
iv) रजोदर्शन के दौरान किशोरियों में साफ–सफाई संबंधी ज्ञान की जानकारी प्राप्त करना।

शोध–पद्धति

i) **अध्ययन का क्षेत्र तथा प्रतिदर्श** : प्रस्तुत शोध कार्य हेतु पटना शहर के विभिन्न स्कूलों (माउंट कार्मल, बाँकीपुर गर्ल्स हाई स्कूल, संत जोसेफ कान्वेट, नोट्रेडम एकादमी) का चयन किया गया है।
ii) **शोध पद्धति** : नमूनों के चयन हेतु असंभावित निर्देशन पद्धति अपनायी गई।
iii) **आँकड़ों का संग्रहण** : साक्षात्कार अनुसूची का प्रयोग किया गया है।
iv) **आँकड़ों का विश्लेषण** : आँकड़ों का विश्लेषण प्रतिशत में किया गया है।

परिकल्पना

i) किशोरियों में रजोदर्शन संबंधी नकारात्मक मनोवृत्ति पाई गई है।
ii) किशोरियों में रजोदर्शन संबंधी सम्पूर्ण ज्ञान का अभाव है।
iii) रजोदर्शन संबंधी अपर्याप्त ज्ञान से उनका सम्पूर्ण स्वास्थ्य प्रभावित होता है।

निष्कर्ष एवं परिचर्चा

तालिका संख्या : 1

उत्तरदाताओं में नारी प्रजनन अंग की जानकारी (N-100)

जनकारी	संख्या	प्रतिशत
हाँ	89	89
नहीं	11	11

इस तालिका से स्पष्ट होता है कि उत्तरदाताओं में सर्वाधिक 89 प्रतिशत को नारी प्रजनन अंगों की जानकारी है तथा 11 प्रतिशत उत्तरदाताओं को इसकी जानकारी नहीं है।

तालिका संख्या : 2

उत्तरदाताओं में रजोदर्शन की सर्वप्रथम प्राप्त जानकारी (N-100)

जनकारी	संख्या	प्रतिशत
माँ	58	58
मित्रगण	23	23
शिक्षिका	19	19

इस तालिका से स्पष्ट होता है कि उत्तरदाताओं में रजोदर्शन की जानकारी सर्वाधिक रूप से माँ से 58 प्रतिशत, मित्रगण से 23 प्रतिशत एवं सबसे कम शिक्षिका से 19 प्रतिशत प्राप्त होती है।

तालिका संख्या : 3

उत्तरदाताओं में रजोदर्शन के दौरान शारीरिक समस्या (N-100)

जनकारी	संख्या	प्रतिशत
पेट दर्द	78	78
डर	10	10
चिंता	5	5
उपरोक्त सभी	7	7

इस तालिका से स्पष्ट होता है कि उत्तरदाताओं में रजोदर्शन के दौरान पेट दर्द 78 प्रतिशत, डर 10 प्रतिशत, चिंता 5 प्रतिशत एवं उपरोक्त सभी 7 प्रतिशत है।

तालिका संख्या : 4

रजोदर्शन के दौरान लगाई जाने वाली बंदिश(N-100)

जनकारी	संख्या	प्रतिशत
हाँ	83	83
नहीं	17	17

इस तालिका से स्पष्ट होता है कि उत्तरदाताओं में 83 प्रतिशत रजोदर्शन के दौरान कई तरह की बंदिशे मानती है। जैसे–पूजा न करना, अंचार नहीं छूना आदि एवं 17 प्रतिशत उत्तरदाता रजोदर्शन के दौरान किसी प्रकार की बंदिशों को नहीं मानती हैं।

तालिका संख्या : 5

रजोदर्शन के विषय में समाज के लोगों की प्रतिक्रिया (N-100)

जनकारी	संख्या	प्रतिशत
सकारात्मक	24	24
नकारात्मक	76	76

इस तालिका से स्पष्ट होता है कि 76 प्रतिशत लोगों में रजोदर्शन के प्रति नकारात्मक प्रतिक्रिया पाई गई जबकि मात्र 24 प्रतिशत लोगों ने ही रजोदर्शन के प्रति सकारात्मक प्रतिक्रिया व्यक्त की है।

शोध का महत्त्व

समाज में विशेषकर महिलाओं में रजोदर्शन संबंधी ज्ञान का अभाव तथा सकारात्मक दृष्टिकोण का अभाव पाया जाता है, जिससे उनका शारीरिक तथा मानसिक स्वास्थ्य प्रभावित होता है और उन्हें कई तरह की समस्याओं का सामना करना पड़ता है।

अध्ययन का विषय बहुत प्रासंगिक है क्योंकि आज की किशोरियाँ ही हमारे भावी नागरिकों की माताएँ हैं। ऐसे में रजोदर्शन की अवधि में उनके स्वास्थ्य की देखभाल तथा इस संबंध में सभी प्रकार की शिक्षा प्रदान करना आवश्यक है।

निष्कर्ष

रजोदर्शन सभी स्वस्थ्य किशोरी का अनुभव है। रजोदर्शन संबंधी ज्ञान तथा इस अवधि में स्वच्छता संबंधी के प्रशिक्षण से मासिक धर्म संबंधी कई मिथकों तथा समस्याओं से बचा जा सकता है। जैसे–स्वच्छता के ज्ञान द्वारा संक्रामक रोगों से बचाव किया जा सकता है तथा अच्छी जीवन शैली से मासिक धर्म संबंधी अनियमितताओं जैसे–अधिक रक्त स्त्राव, कम रक्त स्त्राव, अनियमित मासिक धर्म से काफी हद तक निजात पाया जा सकता है। जागरूकता की दृष्टि से यौन शिक्षा को स्कूली पाठ्यक्रमों में शामिल किया जा सकता है जिससे किशोरियों में रजोदर्शन संबंधी ज्ञान में वृद्धि होगी।

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किशोरियों में सूक्ष्म पोषक तत्त्वों (खनिज लवणों) के प्रति ज्ञान एवं उपभोग का अध्ययन

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सारांश : *प्रस्तुत शोध किशोरियों में संतुलित आहार के एक प्रमुख घटक खनिज लवण के प्रति ज्ञान एवं उपभोग की स्थिति का आकलन करने के लिए किया गया है। जिसके लिए 50 किशोरियों (गृह विज्ञान की छात्राओं) का पटना शहर के पाँच महाविद्यालयों से आकस्मिक प्रतिचयन विधि द्वारा चयन किया गया। आँकड़ों के संग्रहण के लिए बंद एवं खुली प्रश्नावली विधि का प्रयोग एवं विश्लेषण प्रतिशत में किया गया है जिसमें यह पाया गया है कि कि छात्राओं में खनिज लवणों के विभिन्न प्रकारों (26) में से 2–3 को छोड़कर सभी लवणों के विभिन्न आयामों, यथा–नाम, प्राप्ति–स्त्रोत, प्रतिदिन की आवश्यकता, कमी एवं अधिकता से होने वाली बीमारियों की जानकारी न्यूनतम थी। ज़ाहिर है कि जानकारी के अभाव में उपयोग भी प्रभावित होता है। किशोरियाँ स्वयं के भोजन में सभी खनिज लवणों के उपयोग के लिए जागरूक भी नहीं थी और प्रयत्नशील भी नहीं पायी गई। अध्ययन का उल्लेखनीय पहलू है कि गृह विज्ञान की छात्राओं में सैद्धान्तिक एवं व्यवहारिक ज्ञान प्राप्त करने के बावजूद भी उत्तरदाता के रुप में सूक्ष्म पोषक तत्त्वों (खनिज लवणों) के प्रति ज्ञान की न्यूनतम स्थिति पाई गई जो एक विचारनीय प्रसंग है। यह उम्मीद की जाती है कि गृह विज्ञान हर छात्रा एक प्रसार कार्यकर्ता की भूमिका निभाएगी। अर्थात छात्राओं को विषय से प्राप्त शिक्षा को खुद पर तथा अपने घर के अलावे सम्बंधियों, दोस्तों, पड़ोसियों एवं समाज में प्रसार करना चाहिए। लेकिन शोध कार्य के दौरान वस्तुस्थिति इससे विपरित नज़र आई है। अर्थात गृह विज्ञान की शिक्षा कॉलेज के वर्ग तक ही सीमित है रोज़मर्रे की ज़िदगी में उसका सही सदुपयोग नहीं हो पा रहा है।*

शब्द कुंजी: खनिज लवण, किशोरावस्था, गृह विज्ञान

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परिचय

भोज्य पद्धार्थों में निहित पोषक तत्त्व हमारे शरीर में भिन्न–भिन्न कार्य करते हैं। शरीर के लिए ज़रूरी पोषक तत्त्वों को मांग के आधार पर दो वर्गो में विभाजित किया गया है। प्रथम–स्थूल पोषक तत्त्व जिसमें प्रोटीन, कार्बोहाइड्रेट एवं वसा तथा द्वितीय–सूक्ष्म पोषक तत्त्व जिसमें विटामिन एवं खनिज लवण शामिल है। जैसा कि नाम से ही विदित होता है कि शरीर की मांग स्थूल पोषक तत्त्वों की ज्यादा एवं सूक्ष्म पोषक तत्त्वों की कम होती है। सूक्ष्म पोषक तत्त्वों में खनिज लवणों की मांग अल्प है परंतु शरीर में उनके निर्माणात्मक एवं नियामक कार्य अत्यंत महत्त्वपूर्ण हैं।

मानव जीवन में वृद्धि एवं विकास की जितनी अवस्थाएँ हैं उन सभी में किशोरावस्था का अपना अलग स्थान है। किशोरियों के लिए यह अवस्था कई विशेष कारणों से महत्त्वपूर्ण होती है जिसमें भविष्य में माँ बनने के लिए खुद को तैयार करना, जो किशोरियाँ गर्भ धारण कर लेती हैं उनके लिए गर्भावस्था की कठिनाईयों को कम करना, गर्भावस्था में किसी बीमारी से बचना, सफलतापूर्वक प्रसव, स्वस्थ्य शिशु को जन्म देना, धात्री माता की भूमिका निभाना, प्रसव के बाद बच्चा एवं खुद का ख्याल रखने हेतु स्वयं को सक्षम बनाना आदि शामिल है। भोजन तथा उसमें निहित पोषक तत्त्वों द्वारा किशोरावस्था की बहुत सारी समस्याओं को बहुत हद तक कम किया जा सकता है, सुलझाया जा सकता है, नियंत्रण में रखा जा सकता है, टाला जा सकता है या फिर अंत किया जा सकता है, क्योंकि भोज्य पद्धार्थों में निहित सभी पोषक तत्त्व न सिर्फ पोषणीय आवश्यकताओं की पूर्ति करते हैं बल्कि उनकी चिकित्सीय भूमिका भी होती है।

किशोरियों में भोजन के क्षेत्र में दो विरोधाभास स्पष्ट रुप से दिखता है। सुन्दर दिखना, शरीर के वजन को संतुलित रखना, शारीरिक बनावट के प्रति सजग रहना, दुबली/पतली/छरहरी दिखने के लिए कम खाना या डायटिंग करना, सुबह का नाश्ता स्किप करना या नाश्ते में अनियमितता से जाने–अनजाने किशोरियों का शरीर कई पोषक तत्त्वों की कमी से जुझने लगता है। वहीं दूसरी ओर कुछ भी खाना, कभी भी खाना, फास्टफूड के प्रति बढ़ता रूझान, दोस्तों के साथ नियमित रुप से स्ट्रीट फूड/रेस्टुरेंट में खाना आदि भी उनके शरीर को स्वस्थ्य रखने के दृष्टि से उचित नहीं है। दोनों ही स्थितियाँ उनके स्वास्थ्य को प्रभावित करती हैं। जब स्वास्थ्य–संबंधी समस्याएं बढ़ने लगती हैं, तब उनमें थोड़ी सजगता बढ़ती है। कई समस्याएँ जब नियत्रंण से बाहर हो जाती हैं तब उन्हें स्वस्थ्य संबंधी कई गंभीर समस्याओं का सामाना करना पड़ता है। ये एक ऐसी क्षति है जिसकी भरपाई असंभव हो जाती है। किशोरावस्था के पोषक तत्त्वों की मांग में खनिज लवणों का महत्त्वपूर्ण स्थान है जिसकी पूर्ति का एक मात्र स्त्रोत है भोज्य पदार्थ। अतः हर किशोरी को प्रत्येक पोषक तत्त्व की विस्तृत जानकारी होनी चाहिए। प्रस्तुत शोध से हमें किशोरियों के खनिज लवणों से संबंधित विभिन्न तथ्यों की जानकारी एवं ज्ञान के स्तर का पता चलता है। चूँकि उत्तरदाताएँ गृह विज्ञान की छात्राएँ है एवं उन्हें खनिज लवणों से संबंधित सभी तथ्यों की जानकारी (सैद्धान्तिक एवं व्यवहारिक) पाठ्यक्रम के माध्यम से दी जाती है ऐसे में कॉलेज से प्राप्त शिक्षा का प्रतिदिन के आहार–व्यवहार में शामिल करने से संबंधित सभी तथ्यों की समीक्षा से कई जानकारियाँ मिलती हैं, जिससे आहार–व्यवहार संबंधित कमियों को दूर करने में सहायता मिल सकेगी। इस शोध से न सिर्फ गृह विज्ञान की छात्राएं बल्कि किशोरियों की एक बड़ी जनसंख्या भी लाभान्वित हो सकेगी ऐसा अनुमान है।

अध्ययन का उद्देश्य

i) किशोरियों में सूक्ष्म पोषक तत्त्वों (खनिज लवणों) के विभिन्न आयामों की जानकारी के स्तर का मूल्यांकन करना।

ii) किशोरियों में सूक्ष्म पोषक तत्त्वों (खनिज लवणों) के विभिन्न आयामों से संबंधित जानकारियों के व्यवहार में आने वाली स्थितियों का अध्ययन करना।

परिकल्पनाएँ

i) किशोरियों में विभिन्न सूक्ष्म पोषक तत्त्वों (खनिज लवणों) के विभिन्न आयामों के प्रति जानकारियाँ अति सूक्ष्म होगी।

ii) किशोरियों के प्रतिदिन के भोजन में सूक्ष्म पोषक तत्त्वों (खनिज लवणों) का स्तर न्यून होगा।

अध्ययन प्रणाली

प्रतिदर्श–प्रस्तुत शोध के लिए पटना के पाँच महाविद्यालयों (मगध महिला कॉलेज, पटना वीमेंस कॉलेज, जे0 डी0 वीमेंस कॉलेज, गंगा देवी महिला कॉलेज एवं श्री अरविन्द महिला कॉलेज) का चयन किया गया है।

निर्देशन–आकार एवं निर्देशन–तकनीक अध्ययन के लिए प्रत्येक महाविद्यालय से गृह विज्ञान की 10 छात्राओं (कुल 50 छात्राओं) का चयन किया गया है। उत्तरदाताओं का चुनाव आकास्मिक प्रतिचयन विधि द्वारा किया गया

आँकड़ों का संग्रहण–आँकड़ों के संग्रहण के लिये बंद एवं खुली प्रश्नावली प्रविधि का चयन किया गया। इस प्रश्नावली का निर्माण शोधकर्ता द्वारा किया गया।

आँकड़ों का विश्लेषण

पोषक तत्त्व	खनिज लवणों के विभिन्न आयाम							
	दैनिक आवश्यकता	उत्तर :में	प्राप्ति स्त्रोत	उत्तर :में	कमी से होने वाली बीमारियाँ	उत्तर :में	अधिकता	उत्तर :में
कैल्सियम	1300mg	0	दूध एवं दूध से बने पदार्थ	90	रिकेट्स एवं बढ़वार रुकना	70	उच्च रक्त चाप· गुर्दे में पथरी	55
फास्फोरस	1250mg	0	दूध, अंडा, मांस, मछली, आंटा	60	थकावट एवं अस्थियों में विकार	60	कैल्सियम होमियोथेसिस	30
सोडियम	1500 gm	0	दूध, मांस, मछली, दही	65	जी मिचलाना, कमजोरी	62	हृदय की बीमारी, रक्तचाप बढ़ना	25
क्लोरिन	3-9 gm	0	साधारण नमक	70		0		0
पोटैशियम	4700 gm	0	दाल, दूध, मछली, पनीर, फल	55	आलस्य, मांसपेशियों में पक्षाघात	43	नाड़ी सम्बन्धी रोग, मांसपेशियों में ऐंठन,दर्द	15
मैग्नीशियम	360mg	0	अनाज, दाल, सूखे मेवे, तेल बीज	35	मांसपेषियों में थकान, संज्ञाहीनता क्वाश्योरकर	42	मानसिक व्याकुलता, नाड़ी एवं हृदय रोग	12
सल्फर	2-2.5 gm	0	दूध, मूंग, प्याज	30	बढ़वार रुकना, त्वचा रुखा होना	0		0
लोहा	15 gm	0	यकृत, अंडा, मांस, मछली, अंडे की जर्दी	80	रक्ताल्पता	72	सिडेरोसिस	49
आयोडिन	150 gm	0	दूध, अंडा, मांस, फल	80	घेंघा या मिक्सीडिमीया	80	थाएरॉक्सिन का अधिक स्त्रावण	52
फलोरिन	3 gm	0	दूध, पनीर, अंडा, आलू	30	फ्लोरोसिस	42	डेंटल एवं कंकाल फ्लोरोसिस	10
ताम्बा	89 gm	0	यकृत, मांस, दाल, वृक्क	35	नाड़ी संबंधी रोग एवं रक्ताल्पता	62	यकृत,हृदय एवं मस्तिष्क की बीमारी	20
जस्ता	9 gm	0	गेहूँ की भूसी, दाल, सब्जी, सूखे मेवे	25	घाव का न भरना, प्रजनन अंगों का विकास ना होना	25	रक्ताल्पता, अमाशय में गांठ	3
मैगनीज	1.6 gm	0	सूखे मटर, जामुन, चाय, कॉफी, सूखे मेवे	15	एन्जाइम्स की क्रियाशीलता होना	30	पेशिय ऐंठन एवं सर दर्द	8
कोबाल्ट	1.1 gm	0		13	वजन कम होना, शारीरिक वृद्वि रुक जाना	15	हृदयाघात मिक्सीडिमा	2
क्रोमियम	24 gm	0		11	वजन कम होना, हृदय एवं यकृत में विकार	12	यकृत एवं वृक्क संबंधित रोग	0
सेलेनियम	55 gm	0		3	यकृत का रोग,सामान्य वृद्वि रुकना,पैरों की अस्थियॉ दुर्बल एवं सर की अस्थियॉ छोटी हो जाती है	27	कैंसर	0
सिलिकन		0			पैरों में सुजन एवं त्वचा पर डरमेटाइटस	0	शरीर की वृद्वि का रुकना	
नकेल	10.25 gm	0				15	डायरिया	0

आँकड़ों का विश्लेषण प्रतिशत में किया गया।

तलिका : किशोरियों में विभिन्न सूक्ष्म पोषक तत्त्वों (खनिज लवणों) के विभिन्न आयामों के ज्ञान (N=50)

परिणाम एवं परिचर्चा

उपर्युक्त तालिका से स्पष्ट स्थितियों का मूल्यांकन :

- कुछ खनिज लवणों (कैल्सियम, आयोडिन, लोहा) को छोड़कर उत्तरदाताओं को लवणों के नाम, प्राप्ति–स्त्रोत, कमी/अधिकता से होनेवाली बीमारियों के बारे में मालूम नहीं था। ज्ञातव्य हो कि उत्तरदाताएँ गृह विज्ञान कि छात्राएँ हैं। गृह विज्ञान कि एक शाखा 'भोजन एवं पोषण' के अन्तर्गत उन्हें खनिज लवणों की विस्तृत जानकारी (सैद्धान्तिक एवं प्रायोगिक दोनों रुपों में) दी जाती है।
- उत्तरदाताओं को स्वयं प्रतिदिन आवश्यक खनिज लवणों की मात्रा ज्ञात नहीं थी ऐसे में ये तत्त्व कितना और कैसे लिया जाए, यह उनके लिए अनावश्यक था।
- किशोरियों का प्रतिदिन का आहार उनके घरों में बनाया जाना वाला भोजन होता है जो परिवार वालों की पसंदानुसार तैयार होता है, न कि भोजन के पोषक तत्त्वों या संतुलित आहार की ज़रूरतों के अनुरूप। ऐसे में लिए गये भोज्य पदार्थों से स्वतः खनिज लवणों की पूर्ति नहीं हो पाती है।
- चूँकि खनिज लवणों की कमी से होने वाली बीमारियों को साबित करना सम्भव नहीं है। अतः किशोरियों को विश्वास दिलाना या फिर खनिज लवण लेने के लिए प्रेरित करना संभव नहीं था।
- उत्तरदाताओं का प्रतिदिन घर में भोज्य पदार्थों का आयोजन एवं भोजन पकाने में भागीदारी न के बराबर पई गई। ऐसी स्थिति में खनिज–लवणों के महत्त्व से संदर्भित कॉलेज से प्राप्त शिक्षा का उनके दैनिक भोजन से कोई सरोकार नहीं पाया गया, और इसे अपने दैनिक भोजन में शामिल करने के संबंध में उनके द्वारा किसी प्रकार की उत्सुकता भी नहीं दिखाई गई।

निष्कर्ष

इस प्रकार, गृह विज्ञान विषय द्वारा दी जाने वाली शिक्षा पुस्तकों–वर्गों तक सीमित रह गई है। गृह विज्ञान की प्रत्येक छात्रा एक प्रसार कार्यकर्ता भी है। गृह विज्ञान की पांचवी शाखा प्रसार शिक्षा के तहत उन्हें वर्ग में प्राप्त शिक्षा का विस्तार करना है। ऐसे में जब उनकी शिक्षा स्वयं के घरों तक ही नहीं पहुँच पा रही है तो परिवार एवं समाज जिनको इस ज्ञान की विशेष ज़रूरत है उन तक पहुँचने की उम्मीद क्षीण नजर आ रही है। यह स्थिति न सिर्फ दुःखद बल्कि शोचनीय भी है। इस क्षेत्र में नियमित रुप से तत्काल क़दम उठाने की आवश्यकता हैं।

संदर्भ सूची

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MICROFINANCE AND WOMEN EMPOWERMENT : ROLE OF WOMEN DEVELOPMENT CORPORATION (W.D.C) - BIHAR

Vishakha Laxmi * Pushpalata Kumari *

ABSTRACT : *This present research work attempts to understand the Micro Finance and women Empowerment and the role of Women Development Corporation(WDC), Bihar. This project deals with the image of Micro Finance Institutions and their role in the accomplishment of the goal of Women Empowerment through Self Help Groups.*

The universe of the study is Women Development Corporation,Patna,Bihar. Both primary and secondary methods have been used in this project.

KEYWORDS: Development, Empowerment, Micro Finance, Self Help Groups and Self -reliance.

INTRODUCTION

Micro Finance has emerged as a powerful and robust instrument for poverty alleviation in the new economy. In India, micro finance feature is dominated by Self Help Groups(SHGs)- Bank Linkage Programme as a cost effective mechanism for providing financial services to the "unreached poor" especially women. Based on the philosophy of peer pressure and group savings as collateral substitute, the SHG programme has been successful in not only in meeting the peculiar needs of the poor people particularly women, but also in strengthening collective self-help capacities of the poor at the local level, leading to their empowerment.

Women are an integral component of every economy. All round development of a nation are possible only when women are considered as equal partners in progress with men. Empowerment of women is a holistic concept. It is multidimensional in its approach. It is a process having personal, economic, social and political dimensions with personal empowerment being the core of the empowerment process. In fact political empowerment will not succeed in the absence of economic empowerment. Empowerment implies expansion of assets and capabilities of people to influence control and hold accountable institution that affects their lives. The empowerment is the process by which women take control and ownership of their choices. The scheme of micro financing through SHGs create empowerment

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promoting conditions for women to move from positions of marginalization within household decision making process and exclusion within community, to one of greater centrality, inclusion of voice. Micro Finance programme enable women to contribute to the house hold economy increasing their intra house hold bargaining power.

OBJECTIVES

i) To create awareness among poor women about Micro Finance Institutions and Self Help Groups.

ii) To reduce dependency on money lenders.

iii) To build up confidence for social change and establish discrimination free society.

iv) To provide a vehicle for the promotion of economic self-reliance for better living.

v) To analyze the positive correlation between Micro Finance and Women Empowerment.

METHODOLOGY

The Study is Based on Information and Data Collected Through:

i) Interaction with the members of SHGs and their organizer.

ii) A study of Primary and Secondary sources and Publications, Government Reports, magazines, Journals, Official reports Paper Clippings and Books.

iii) A study of the Policies enforced by the Central and State Governments,their plans and Programmes concerning the issue.

CONCEPT OF MICROFINANCE

Microfinance refers to a collective set of banking practices built around providing small loans (typically without collateral) and accepting tiny or small saving/deposits. Microfinance or Microcredit is a provision of thrift, credit and other financial services and products of very small amount to the poor in rural, semi-urban and even in urban areas for enabling them to raise their income levels and improve their living standard. The institutions which provide these facilities are known as Microfinance Institutions. Access to finance at reasonable interest rates has become one of the essential preconditions for successful entrepreneurship among the poor. Microfinance is a means for improving socio-economic conditions of the poor by eradicating poverty. It is an age old method to fulfil the credit requirement in rural areas, though not in an organized manner. With the development of civilization and knowledge, it has taken a scientific shape. Microfinance has gained a lot of significance and momentum in the last decade. It is considered as the most suitable and feasible alternative in accomplishing the goal of growth with justice and eradication of poverty. If we want to eliminate poverty and make Indian economy a vibrant economy in the world, we have to provide small amount of finance to the poor for a new start.

MICROFINANCE IS COMMONLY USED WHILE DISCUSSING ISSUES RELATED TO

i) Poverty alleviation.

ii) Increasing small savings.

iii) Without collateral security availability to timely, adequate and uninterrupted finances.

iv) Financial support to the domestic and micro entrepreneurs.

v) Increasing purchasing power to participate in market economy.

vi) Gender development.

vii) Promotion for well livelihood .

ADVANTAGES OF MICRO FINANCE

i) To know how to organize in a group.

ii) To know how to mobilize their own funds.

iii) To know how to utilize the fund effectively.

iv) Learn how to manage money.

v) How to rotate their funds.

vi) It enhances confidence in women and her capacities to intervene in local governance beyond the limited goals of ensuring excess to credit.

CONCEPT OF SELF HELP GROUP

SHG is a registered or unregistered voluntary association of poor people (micro-entrepreneurs) of 10 to 20, having the same socio-economic back ground, involving primarily in saving and credit activities. They collect voluntary savings on a regular basis and use the pooled resources to make small interest bearing loans to their members. They are ready to contribute to a common fund and to meet their emergency needs on mutual help basis. SHG is formed by consensus democratically without any political affiliations. The members may be either only men or only women or a mixed group. It has been observed that over 90% of these groups have only women members. All the savings deposited by members of SHG form the part of corpus and the members are taking loans out the corpus of the group. The group corpus consists of (a) Savings (b) government assistance and (c) bank loan.

It covers all types of micro products and micro services like micro-insurances, micro-pension fund, micro marketing targeted for the poor people.

WOMEN AND MICROFINANCE

In India a large section of population lives below poverty line. Prevalence of poverty is higher in rural areas in general and among the rural women in particular. One of the major factors for the poverty of rural women is the higher rate of unemployment among women. This higher rate of unemployment among women can be eradicated is possible through microfinance. Microfinance is very useful for women as women are more conscious of their selfrespect and responsiblity towards their family. To avoid peer pressure from SHG members, she uses the money in a proper way and repayment of loan is also regular. Women are more trust working than male members. So participation of women in group is highly fruitful in microfinance. Microfinance has the potential to enhance women capabilities which can make significant differences to overall development of women. It induces confidence in women. Various studies have revealed that women members associated with SHG for a longer time emerged as more confident, financially more secure, more in control of their life and family. The abilities, ownership of economic assets, development of skills, ability to decide about self has changed the socio-economic conditions of women. Association with SHG for a longer time develops ability to participate in political field. In Bihar this trend had been already seen in election of Panchayati Raj System. SHG would essentially form for the purpose of empowering the poor in general and women in particular. So that they can take charge of critical decisions concerning their lives and improve their quality. Women's participation in various activities of SHG is important for fulfilling the broad aims and objectives of micro financing and healthy and effective functioning of SHGs. The SHG bring a sea change in women from a housewife to money earner, manager, organizer, decision maker, controller of family affairs etc. They are getting training and knowledge in the field of practical economics Microfinance and SHGs are not merely a system of financing but it is changing the social and economic conditions of poor and especially women. Women are important part of a society, building their capability to manage communities and community project should be enhanced. If we want to improve the economic condition of a family or nation, we have to enrich and empower women.

SALIENT FEATURES OF SHG AND MICROFINANCE

i) **Small And Fixed Savings At Frequent Intervals :** Small and fixed savings made at regular intervals coupled with conditions like compulsory

attendance, penal provisions to ensure timely attendance, saving, repayment etc. forms a deterrent for the rich to join the SHG system- thereby enables exclusion of the rich.

ii) **Self-Selection :** The members select their own members to form groups. The members residing in the same neighbourhood ensure better character screening and tend to exclude deviant behaved ones.

iii) **Focus On Women :** As regular meetings and savings are compulsory ingredients in the product design, it becomes more suitable for the women clients- as group formation and participatory meetings is a natural ally for the women to follow.

iv) **Savings First And Credit Later :** The saving first concept enables the poor to gradually understand the importance of saving, appreciate the nuances of credit concept using their own money before seeking external support (credit) for fulfilling future needs. The poor tend to understand and respect the terms of credit better.

v) **Intra Group Appraisal Systems And P222rioritization:** Essentials of good credit management.Like (peer) appraisal for credit needs (checking the antecedents and needs before sanction), (peer) monitoring - end use of credit; (peer sympathy) reschedulement in case of crisis and (peer pressure) collateral in case of wilful non-payment etc. all seems to coexist in the system making its one of the best approaches for providing financial services to the poor.

vi) **Credit Rationing:** The approach of prioritization i.e. Meeting critical needs first serves as a useful tool for intra-group lending. This ensures the potential credit takers/users to meticulously follow up credit already dispensed, as future credit disbursals rely on repayments by the existing credit users.

vii) **Shorter repayment terms:** Smaller and shorter repayment schedule ensures faster recycling of funds, greater fiscal prudence in the poor and drives away the slackness and complacency that tends to set-in, in long duration credit cycles.

viii) **Market rates of interest:** Self-determined interest rates are normally market related. Sub-market interest rates could spell doom; distort the use and direction of credit.

ix) **Progressive lending:** The practice of repeat loans and often-higher doses - is followed by SHGs in their intragroup loaning, thereby enticing prompt repayments.

x) **A multiple-eyed operation:** The operations of the SHG are transacted in group meetings thus enabling high trust levels and openness in the SHG system. The banking transactions are also generally conducted by SHG members facilitating openness and freedom from unfair practices.

ROLE OF WOMEN DEVELOPMENT CORPORATION AND MICROFINANCE

Women Development Corporation (WDC) Bihar is working under the aegis of Social Welfare Department, GoB. WDC has supported the formation of about 80 SHG federations mostly at the Block level. Under its economic empowerment component WDC is committed to provide microfinance to its 40000 SHGs. At present Total 8808 SHGs have been linked with the banks amounting Rs.333351561 and microfinance through SHG federation as Initial Capitalization Fund (ICF) of 6374 SHG amounting Rs.107382500.

The broader goal of the Micro-Finance intervention through the project is to create an ambience of faith as regards the approach of banking with the poor. It is aimed at creating institutions of the poor who are empowered enough to run the institution on merits of financial prudence

and sustainability. It also aims at taking multi-pronged strategy for ensuring financial flow to the rural economy from main stream financial institutions and other complementary sources like that of SHPIs and MFIs.

CHALLENGES AND CONSTRAINTS FACING THE SHG PROGRAMME

PROBLEM OF SHGs OUTREACH

The SHG programmes show a much skewed growth pattern in the country. The programme is largely concentrated in southern region of the country. It is important that the microfinance programmes spread more evenly so that the benefits are available especially in regions where the need is more accurate. This calls for increased investment in SHG formation and development by banks and government. The programmes have to orient themselves to the needs of the very poor as the existing SHG models have not been able to cover this section significantly.

RESTRICTIVE POLICIES OF FORMAL AGENCIES

The second major constraint faced by SHGs is the continued restrictive loan policies of the commercial banks. The commercial banks took a long time to clearly recognise and internalise the concept. The SHG model is primarily a savings based model. The commercial banks have been following largely 1:4 savings-credit ratios prescribed more as a norm for lending. Even the loan terms are uniformly prescribed. SHGs having lower savings ability find the lending ratio highly restrictive. As a result, many SHGs are unable access credit adequately. This is forcing SHG members to restrict loan size/period and even distribute loan amount equally. There are instances of AHG members going back to money lenders. In many cases banks are also not able to give adequate time to SHGs forcing SHGs to operate more in ways which suit banks than the SHGs. If SHGs, whose strengths lie in informality, have to make better impact, the formal system has to tune itself to the needs of SHGs and their members. This calls for adopting highly proactive and innovative policies to deal with the SHGs.

DEVELOPMENT OF SKILLS AND LINKAGES

The success of SHGs in contributing to poverty alleviation and empowerment depends on the ability of members to take up newer and productive investment activities. Even where there is positive impact, it has been found that SHG members have utilised the loans mainly in conventional activities like agriculture, animal husbandry and petty business. Policy interventions are required to develop the entrepreneurial skills of women and prepare them start new ventures.

SHG QUALITY AND LEADERSHIP

The performance of SHGs to a great extent depends upon their quality of governance and management. Available evidence clearly suggests that the quality of SHGs has suffered due to their fast growth. The major reasons attributed for the poor quality of SHGs are: target based promotion of SHGs, inadequate training and capacity building and widespread illiteracy of the members. Continued and specialised training can help develop the abilities of SHGs maturing fully.

Another area of concern is SHG leadership. SHGs have nurtured some exceptional leaders who have excelled both in managing their SHGs and contributing to the sphere of village development. But it is found that SHG leaders have benefited relatively more from their SHGs both financially and in terms of development of individual abilities as compared to other members. It is necessary that SHG benefit other members in a similar way. The promoting agencies need to help in broad basing the leadership of SHGs.

SUCCESS FACTORS IN SHGs-BANKING

The factors that contributed to successful SHG-Banking under NABARD can be summarised as follows:

i)The SHG is an organisational framework ensuring members direct access to and control of additional resources borrowed from the bank. They participate willingly because the SHG - system is designed in ways conducive to their active participation, shared interest, responsibility and economic potential. And SHG members retail the money according to own economic inspiration and preference without any tight supervision by the bank.

REPRESENTATIVES

ii) The concept of saving first had a much more decisive impact than anything else. Saving is the initial source of loanable fund and by transforming their savings plus the loan from the bank into interest bearing loans; the SHGs augmented their resources with retained earnings. The propensity to save has increased with Bank access. Self Help instead of government spoon feeding, autonomy instead of constant bureaucratic intervention, flexibility and spontaneity may be determining factors for success. Therefore the SHG system should and cannot be utilised as instruments of government agencies to implement development schemes of the Government.

iii)SHGs as clients facilitate wider outreach at lower transaction costs and much lower risk costs. The participating Banks experienced so far low additional operational cost and marginal loan losses. Therefore the amount made available to SHGs for loans and the average size of loans was growing quickly.

iv) The SHG-system is working like an informal insurance system that allows managing risks and income gaps very effectively and this was most needed according to member's priority assessment.

v) The SHG-system covers another urgent need of the poor; it is evolving as an effective people's banking nucleus which allocates money into the economy of the poor with the purpose of stimulating self-reliant indigenous developments tapping the manifold skills that poor already possess.

vi)The sovereign role of NABARD in policy advocacy and designing SHG-Banking strategy, involving a variety of institutions including RBI and Government, influencing policy, funding and technical support, motivating, training and coordinating with partners, stimulating innovations in financial technology and moulding attitudes is definitely the key to success.

vii)Most outstanding is also the role of NABARD in building commitments through capacity building training which has prepared the ground for SHG-Banking and contributed most to building trust and confidence between the banks and the rural poor. More than 7000 orientation programmes were funded and guided to establish the new capacity required.

The Economic Impact of SHG-Banking on Poor Households:

It has been found from several studies that SHG -Banking has following benefits:

- Enables increased propensity to save
- Permits enhanced net incremental incomes
- Smoothens income inequalities
- Assists reduction of indebtedness with moneylenders and freedom from bondages
- Enables additional employment generation
- Facilitates empowerment of women

SALIENT FEATURES OF SHGs AND MICROFINANCE

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ix)**Progressive Lending :** The practice of repeat loans and often-higher doses - is followed by SHGs in their intragroup loaning, thereby enticing prompt repayments.

x) **A Multiple-Eyed Operation :** The operations of the SHG are transacted in group meetings thus enabling high trust levels and openness in the SHG system. The banking transactions are also generally conducted by SHG members facilitating openness and freedom from unfair practices.

FINDINGS

The following areas of findings for intervention for the SHG and MF sector may be considered:

i) Development of standards for SHGs.

ii) Support for MF and promotion of SHGs in poverty belt states.

iii) Development of loan products for MFIs working in undeveloped states.

iv) Funding for state-level support institutions and resource NGOs for SHG development.

v) Research on SHG/SHG federation sustainability.

vi) Continued grant support for SHG promotion.

vii) The local and the national government have an important role to play in ensuring the growth and improvement of microfinance.

viii) Special incentives should be provided to NGOs working particularly in hilly and backward areas.

ix) Micro-financing interest rates are high which range about 25%. The best way to lower interest rates, would be to encourage more MFIs because the more the competition the more will be the innovative idea for the reduction of the interest rates by way of reducing the cost of the management.

x) There is a need to build strong and efficient micro-finance institutions. This requires governance, professionalism management, strengthening internal control and accounting and introducing low cost ways of doing business. The biggest hope on cost reduction comes from new technology, for example, transferring funds via mobile phones.

xi) RBI regulates financial services in India, yet currently various aspects of microfinance are handled by various departments. This multiplicity should be simplified.

CONCLUSION

There is a need for substantial scaling up of microfinance which includes credit, savings and insurance. As the banking sector is not able to meet the entire credit needs of the poor, it is necessary to encourage the growth of MFIs, subject to appropriate regulation which should not be too restrictive. As the money lenders are still dominant in the rural credit sector, it is pragmatic to institutionalise them with adequate safeguards to prevent exploitation of the poor. There is also a need to shift the focus from the quantity of credit to the quality of credit. In order to achieve this, emphasis should be given to creation of adequate infrastructure, efficient extension services, processing and marketing facilities etc. Emphasis should also be given to SHG formation and group lending rather than individual lending. Micro-finance Ombudsmen may be set up at district levels to decide on complaints regarding exploitative and illegal practices by the lenders.

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A STUDY OF MENTAL HEALTH OF WORKING AND NON-WORKING WOMEN

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ABSTRACT : *The present research aims at measuring the mental health of working and non - working women. For this purpose the hypothesis was formulated: "The working and non - working women would differ significantly from each other in terms of their mental health". This study was conducted on a total sample of 80 females (40 working and 40 non - working) between the ages of 20-30 of Patna district by using the incidental sampling technique. The Mental Health Inventory was used to measure the mental health of working and non - working women. The collected data were assessed by using t - ratio. Results of the research support the hypotheses. Findings indicate that the mental health of working women is better than non - working women and mental health is influenced by the status of working and non - working women.*

KEYWORDS : Mental Health , Working & Non-Working Women.

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INTRODUCTION

The Present investigation aims at studying the mental health of working women and non-working women. Generally it is understood that when a person is free from mental illness, then it is said that she is mentally fit and her that condition is said to be his mental health. But some psychologists say that it is not correct to say that a person who is free from mental illness is mentally fit because mentally fit person also have symptoms of impulsivity, emotionalstability, etc. That is why advanced clinical psychological describes the mental health as a power of adaptability after focusing on it. According to Karl Menninger, (1945) "Mental Health is the adjustment of human beings to the world and to each other with a maximumeffectiveness and happiness ……. It is the ability to maintain uneven temper, an alert intelligence, socially considerate behavior and a happy disposition." In the words of Reber and Reber (2001) "The term, mental health is used to designate one who is functioning at a high level of behaviour and emotional adjustment and adaptiveness and not for one who is simply not mentally ill." So mental health is a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stress of life, can work productively and fruit-fully. The successful performance of mental function, resulting in productive activities, fulfilling relationship with other people and the ability to adapt to change, cope with adversity, from early

childhood until late life, mental health is a spring board of thinking and communications skills, learning, emotional growth, resilience and self esteem.

Clinical psychologists have mentioned some main characteristics of mentally healthy people. Such as:

Self Knowledge : The main characteristic of mental healthy man is that he knows all of his inspiration, desires, wishes, behaviour. Self Evaluation: Mentally health man can examine his character. He studies his each behavior and examines the limitations of his behaviour. Self-Esteem: There is enough healthy man, there is an extreme feeling that he is accepted member of society and people respect him. He interacts with other frankly and participates openly in social functions. He does not suppress his wishes in spite of the pressure of society. Ability to form satisfying

Relationship : One property of mentally healthy man is also that he is happy to keep satisfying relation with others. He never keeps unrealistic demands to others. As a result, his relations with others remain always satisfying.

Realistic Perception : A mentally healthy man perceive anybody, incident or thing objectively. They don't rely on some imaginary - facts during perception their own way etc. but some factors influencing mental health like Physical Health: - In many studies of neuroscience it is provided that there is a deep relation between physical and mental health. The person who has good physical health, generally things are unavailable because of physical energy and work satisfaction. As a result they have good mental health.

Satisfaction Of Primary Needs : Every person has its own needs in which some of them are primary and some are secondary. The people whose own needs are fulfilled, then his mental health become fit. Its main reason is that these persons don't have any kind of conflict in their mind and the percentage of self-satisfaction increase.

Lack Of Mental Illness Among Members Of Family : According to some, clinical psychologist like 'Shafer' (1975) maladaptive behaviors are learned. If any person of a family specially mother-father or other important member is mentally ill then, other members of the family are also affected by their behavior try to adapt their behavior. It affects their mental health badly and they start losing their mental balance and slowly-slowly they become mentally ill.

Unsocial Environment : Phares(1980) has provided some evidence according to him when a person living in unhealthy, unsocial environment and unfair environment and do his interactions then guilt feeling self-condemnation start developing in its which decreases their mental health. Phares (1980) has focuses many cases in which person has good mental health but it starts decreasing after sometime. The reason of their bad mental health is their unsocial environment (Arun kumar Singh, Advanced Clinical Psychology,p.421).

Lack Of Means Of Entertainment : Machover (1990) has mentioned the direct relation between proper entertainment and mental health. According to him if a person have proper source of entertainment then his mental health is good. But because of any reason if proper source of entertainment is not available, then he got mentally suffocated and his mental health starts decreasing day-by-day.

So it is proved that mental health is affected by many factors. If we control these factors, we got good mental health(Arun kumar Singh, Advanced Clinical Psychology,p.422).

Many studies have conducted in the field of mental health of working and non - working women. Usha R. Rout, Cary L. Cooper and Helen Kerslake,(1999); expands on research which has demonstrated that employment has positive or normal effects on women's health. This pilot study examines whether these positive effects could also be found in employed mothers by comparing working mother with non-working mothers and measures of mental health, self-esteem and mother role satisfaction. The working mothers had better mental health and reported less depression than the non-working mothers. The most frequently reported source of stress for working mothers was not having enough time to do everything, where as for non-

working mothers lack of social life was a major stressor. Many studies show that in India there are male dominating families available. In that type of family women are always pressurized by man. Man doesn't care for her self esteem or self respect. In that type of family she is suffering from poor health and bad mental health. But working women have their own financial status so they donot dependent on their husband and they have their own identification. A non-working woman has a serious problem related to herself be "isolation". She is far from her friends and is able to share her feeling because she has lack of time for herself. Isolation helps to develop weak mental health where as working women have big friends' circle. They are very social and know well how to interact with other important people in their social life. Generally a working woman has an extrovert personality. She is happy to have anybody's company and easily interacts with other people and that's why she get confidence to take decision easily and solve any type of problem and applies her energy in productive work and lives happy in it. She shows excitement and moral in such work etc. whereas Non-working women have more family responsibilities than working women. She is always leading her life according to the family situation. She is not free to do whatever she wants, doesn't give time to herself. These make her weak physically and mentally. she is easily affected by internally driven. Iqbal A. Nadeem R and Fatiman, Shaukat Khan, (2004); reported that a non-working woman is more anxious than a working woman. (She cares to every one's statements and likes to know that what are her relatives think about her.) When she gets negative response from others she gets upset. Some non-working women come not of frustrations with their domestic routine by involving in non-paid social and charitable activities rather than paid employment consequently. They are open to an equally wide sphere of contact and relationship as working lady. Waris Qidwai, Shahan Waheed Salma Ayub and Syed Iqbal Azam,(2008); conducted a study on impact of working status on their lives. Two hundred working women were interviewed. The status of working women was better than non-working women according to 123 (61.5%) respondents. Financial benefits outweigh other disadvantage according to 105 (52.5%) respondents. Married prospects of working women and their children are better than non-working women and their children according to eight one respondents respectively. Confidence in working women is higher than non-working women according to 142 (71%) respondents feel that working women's financial independence has negative impact on their husband's self esteem working women find it difficult responsibilities.

HYPOTHESIS

It was hypothesized that "The working and non-working women would differ significantly from each other in terms of their mental health".

METHODOLOGY

Sample : The sample comprised of 40 working and 40 non-working women. The research was conducted a sample of 80 females belong to the age group of 20-50 years old. We are collecting our sample from Patna District. The incidental sample was used in the present research.

TEST AND SCALES USED

Following scales were used to measure the mental health of working and non-working women.

i) Mental Health Inventory.

ii) Personal Data Blank.

MENTAL HEALTH INVENTORY

Mental health inventory was constructed and standardized by Dr. Jagdish and A.K. Srivastava. The scale measure different areas or dimension of mental health. It consists of 54 items and 54 items are to be answered in 4 alternative responses i.e. always, most of time, some time and never …… 4 scores to 'always' 3 scores to 'Most of time' 2 scored to 'Some time' and 1 score to 'Never' marked responses as to be assigned for true keys (positive) statement where as 1, 2, 3 and 4 scores for

"Always", "Most of Time", "Some Time" and "Never" respectively in case of false keyed (Negative) statement. The total score are a measure of 'Mental Health' only.

Items Are Related To The Following Areas :

- Positive self-evaluation (PSE)
- Perception of Reality (PR)
- Integration of Personality (IP)
- Autonomy (AUTNY)
- Group Oriented Attitudes (GOA)
- Environmental Mastery (EM)

An individual with high score namely above 195.89 indicates that the person has very good mental health, 176.45 to below 195.89indicates good mental health, 157.01 to below 176.45 indicates average mental health, 137.57 to below 157.01 indicates poor mental health and below 137.57 indicates very poor mental health. Reliability of the test by split half method is 0.73 and the validity of the inventory is 0.57.

PERSONAL DATA BLANK

It consisted of fundamental information about the subject such as name, age, income etc.

RESULT AND DISCUSSION

This chapter is devoted to the result and discussion of the computation made for the verification of the hypothesis formulated. After collection of data it is necessary to draw some conclusion regarding it. For this purpose it was required to organized and classify the data were tabulated for showing mean, SD, SEm, SEd and T.-ratio of the score on mental health among working and non-working women.

TABLE

PRESENT THE SUMMARY OF COMPUTATION OF CENTRAL TENDENCY, VARIABILITY AND T-RATIO OF THE SCORE OF MENTAL HEALTH OF WORKING AND NON-WORKING WOMEN

Groups	Mean	SD	SEm	SEd	Df	t-ratio	Level of significance
Working Women	152.26	5.23	0.83	1.2	78	15.83	P<0.01
Non-Working Women	132.95	5.43	0.87				

Table shows that SD and SEm of score of mental health of working women are 152.26, 5.23 and 0.83 respectively where as mean, SD and SEm of score of mental health of non-working women are 132.95, 5.24 and 0.87 respectively. Differences between two means of group 'a' and 'b' show internal consistency because SD is very less comparison to two means.

t-ratio was calculated for the verification of the hypothesis. An inspection of Table shows that t-ratio computed on the score of mental health of working and non-working women (t-ratio = 15.83, df = 78) was significant at 0.01 level of confidence.

Thus, the hypothesis that "working and non-working women would differ significantly from each other in terms of their mental health" was supported. Hence, the mental health of women is influenced by their working or non-working women status.

CONCLUSION

In the light of finding of the present study following conclusion were drawn :

- The mean value of the score on the mental health scale of the working women and non-working women reveals that the mental health of working women is better than the non-working women
- There is internal consistency in the subject's response of Group 'A' (Working women) and Group 'B' (Non-working women) because SD (Standard deviation) value of both the Group is very less compared to two means

- On the basis of t-ratio, it can be said that there is a significant difference between the mental health of working women and non-working women
- There is difference between the mean of working and non-working women is real and obtained t-ratio was significant are 0.01 level. Hence it supports the hypothesis

So on the basis this study it can be said that the mental health of working women were better than non-working women because as far working women who have more positive self-evaluation , accurate perception of reality, Autonomy etc. than non-working women. Non - working women also don't have strong self-esteem, accurate self-evaluation and feeling of security, absence of tension, ability to be productive and happy, clear life goal etc. So it can be said that working women have good mental health than non-working women and the mental health of women is influenced by their working or non-working women status.

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EFFECT OF FAMILIAL RELATIONSHIP ON THE ADJUSTMENT OF ADOLESCENT GIRLS : AN ANALYTICAL STUDY

Rashmi Kumari * Milee Khatun * Sonali Bose *

ABSTRACT : *The present investigation aims at studying the various adjustments of joint family & nuclear family. The following hypotheses were proposed for the research:- It is hypothesized that adolescent girls of nuclear family will be emotionally better adjusted than adolescent girls of joint family.There will be significant difference between nuclear family and joint family's adolescent girls in terms of their home adjustment.It is hypothesized that adolescent girls of joint family will be better socially adjusted than adolescent girls of nuclear family.*

The research was conducted on a sample of 100 adolescents' girls comprising 50 joint and 50 nuclear family depending upon the availability of the desired sample.

KEYWORDS: Adolescent, Investigation, Emotionally

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INTRODUCTION

The family is the source of unique ties to others, for within it, children experience their first relationship abiding of commitment and love.

NUCLEAR FAMILY

It is composed of the following members a man, his wife and unmarried children. It is most conspicuous in the modem European and Indian societies.

JOINT FAMILY

If two or more nuclear families live together under a common shelter, and share a common health, and a common purse, then this type of family is known as joint family.

ABOUT ADOLESCENTS

According to Erikson, established an identity involves a search for continuity of the self's attributes over time. WHO identifies adolescence as the period in human growth and development that occurs after childhood and before adulthood , from ages 10 to 19 . It represents one of the critical transitions in the life span and is characterized by a tremendous pace in growth and change that is second only to that of infancy.

Adolescent Develops Under Four Areas :

- **Physical Development :**Adolescence is a time of change throughout the body . Girls begins to develop breasts and starts their period

- **Cognitive Development :** This is how the brain develops the abilities to think, learn, reason, and remember . they are also beginning to see that issues are not just clear-cut and that information can be interpreted in different ways
- **Emotional And Social Development :** When at home , adolescents may prefer spending time alone to being part of the family . still , family support is important to help them build a strong sense of self
- **Sensory And Motor Development:** Their brains need time to adjust. Getting regular moderate exercise can improve coordination and help your child build healthy habits

SOCIAL ADJUSTMENT

It is the achievement of balance in social relationships usually aided by the appropriate application of social skill.

HOME ADJUSTMENT

Most prior studies have relied on caregiver reports of parental separations or residential , mobility , which may not provide the best representation of child or adolescent experiences.

EMOTIONAL ADJUSTMENT

Emotional adjustment is the maintenance of emotional equilibrium in the face of internal and external stressors.

REVIEW OF LITERATURES

i) Kaur (1999) made an extensive study on emotional intelligence in relation to adjustment of adolescents. She found that there was not any significant difference in emotional intelligence and adjustment of boys and girls.

ii) Gupta (2002) in her study, "adjustment of adolescents in relation to modernization", concluded that there exists no significant relation between "adjustment and modernization"

iii) Malhotra (1991) in his study, " A study of personality, self-perception and adjustment of University students" found there was no significant difference on extraversion introversion of students studying different subjects.

iv) Roy and Mitra (2012) examined the pattern of adjustment among early and late adolescent school students. The study revealed that early and late adolescents group differed significantly from each other in the home, health and social areas of adjustment. Girls showed better adjustment than boys.

v) Singh (2006) examined the effects of socio, emotional and socio emotional climate of the school and sex on the adjustment of students along with their interactions effects. Boys were significantly better than girls in their health adjustment at different levels os socio-emotional climate of the school.

PURPOSE

Thepurpose of this project is to identify the difference between the joint family's girls of joint family and the girls of nuclear family and their adjustments .

HYPOTHESIS

It is hypothesized that adolescence girls of nuclear family will be emotionally better adjusted than adolescence girls of joint family.

There will be significant difference between nuclear family and joint family's adolescence girls in terms of their home adjustment.

It is hypothesized that adolescence girls of joint family will be better socially adjusted than adolescents girls of nuclear family.

METHODS

Sample : A technique of incidental sampling was adopted for the present study. sample of 100 students, in which 50 sample were taken from nuclear family & 50 were taken from joint family. All the selected sampled were adolescents' girls.

Tools : In this study Bell Adjustment Inventory was used which was developed by S.M.MOHSIN & S. HUSAIN.4.

RESULTS & DISCUSSION

Summary of Mean , SD , SE , SED , and t-ratio of Joint and nuclear family's adolescent girls in term of their home adjustment.

TABLE : 1

Group	Mean	SD	SE	SED	t-ratio (df=98)
Joint Family	9.64	4.45	0.63	1.69	0.80
Nuclear Family	11	11.11	1.57		

The hypothesis of above table was that adolescent girls of nuclear family will be better adjusted in the home than adolescent girls of joint family which was not significant at even at .05 level- then it can be said that on the basis of result there was no significant difference between joint family & nuclear family.

Summary of Mean, SD, SE, SED, and t-ratio of Joint and nuclear family's adolescent girls in term of their emotional adjustment.

TABLE : 2

Group	Mean	SD	SE	SED	t-ratio (df=98)
Joint Family	14.14	5.74	0.81	0.89	0.27
Nuclear Family	13.9	22.73	0.38		

The hypothesis of above table was that adolescent girls of nuclear family will be better adjusted in the emotional than adolescent girls of joint family which was no significant at even at .05 level- then it can be said that on the basis of result there was no significant difference between joint family & nuclear family.

Summary of Mean , SD , SE , SED , and t-ratio of Joint and nuclear family's adolescent girls in term of their social adjustment.

TABLE : 3

Group	Mean	SD	SE	SED	t-ratio (df=98)
Joint Family	13.22	7.96	1.12	1.19	0.76
Nuclear Family	12.32	2.88	0.40		

The hypothesis of above table was that adolescent girls of nuclear family will be better adjusted in the social than adolescent girls of joint family which was no significant at even at .05 level- then it can be said that on the basis of result there was no significant difference between joint family & nuclear family.

The data analyzed by computing t-ratio. There was no significant difference was found proved on the basis of result of this study. It may be due to total sample taken for present research was been small which needs a broader study.

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लिंग आधारित हिंसा : एक सामाजिक अध्ययन

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सारांश : लिंग आधारित हिंसा हमारे समाज का एक चिंताजनक विषय है। इसकी शिकार मुख्य रूप से महिलाएँ एवं बच्चियाँ हो रही हैं। लिंग आधारित हिंसा का एक प्रमुख कारण पितृसत्तात्मक समाज हैं, जिसके फलस्वरूप हमारे समाज में लिंग भेद की स्थिति उत्पन्न होती है। अर्थात् हम यह कह सकते हैं कि पितृसत्ता, गैर बराबरी, भेदभाव और हिंसा को जन्म देती है।

शब्द कुंजी:पितृसत्ता,पितृसत्तात्मक समाज, जैविकीय, जेंडर

परिचय

लिंग (सेक्स) एक जैविकीय रचना है जो किसी महिला या किसी पुरुष के बीच पाये जाने वाले शारीरिक अन्तर को स्पष्ट करती है। अर्थात् यह औरत व मर्द के जननांगों तथा उससे जुड़े प्रजनन कार्यों को स्पष्ट करती है। इस प्रकार सेक्स उन शारीरिक लक्षणों का उल्लेख करता है जिसे किसी व्यक्ति की पहचान एक औरत या एक मर्द के रूप में होती हैं।

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जेंडर एक सामाजिक-सांस्कृतिक रचना है, जिसे समाज ने बनाया है। इसका संबंध पुरुषोचित, स्त्रियोचित गुणों, व्यवहार के तरीकों, भूमिकाओं, अधिकारों आदि से है। शाब्दिक रूप से सेक्स और जेंडर को एक ही समझ लिया जाता है। लेकिन इन दोनों में पर्याप्त अन्तर देखने को मिलते है-जैसे लिंग जैविकीय या शारीरिक है, जबकि जेन्डर सामाजिक-सांस्कृतिक है, जिसे समाज ने बनाया है। लिंग स्थायी होता है जबकि जेंडर परिवर्तनशील और अस्थायी होता है। लिंग को बदला नहीं जा सकता है–जबकि जेंडर को बदला जा सकता है। इन दोनों के बीच अन्तर को समझने के बाद प्रश्न ये उठता है कि हिंसा किसे कहते हैं?

हिंसा एक ऐसी घटना है जो सार्वभौमिक रूप से घटित होती है। अर्थात् जब कोई भी व्यक्ति किसी दूसरे व्यक्ति को शारीरिक, मानसिक, आर्थिक या यौनिक रूप से तकलीफ पहुँचाए या उसके कार्य अथवा व्यवहारों को प्रभावित करे तथा किसी के शरीर पर चोट पहुँचाए तो इसे हम हिंसा कहते हैं।

लिंग के आधार पर की जाने वाली हिंसा ही लिंग आधारित हिंसा कहलाती है। इसके चार प्रकार हैं, यथा–**शारीरिक हिंसा**–इसके अन्तर्गत मारपीट, थप्पड़ मारना, जला देना, दहेज हत्या करना या किसी अन्य तरह से चोट पहुँचाना शामिल हैं। **लिंग आधारित हिंसा**–ये मौखिक या भावात्मक हिंसा के रूप में भी हो सकती है। इसके अन्तर्गत गाली-गलौज, ताना-मारना या अपमानित करना आदि शामिल है। **यौनिक हिंसा**–इसके अन्तर्गत बलात्कार, यौन उत्पीड़न या यौनिक दुर्व्यवहार आदि शामिल है। **आर्थिक हिंसा**–इसके अन्तर्गत खाना, कपड़ा, दवाई आदि का खर्च न देना घर में नहीं रहने देना इत्यादि सम्मिलित है।

इसके फलस्वरूप हम यह देखते हैं कि लिंग आधारित हिंसा का सर्वप्रमुख कारण पितृसत्ता है, जिसमें पुरुषों को स्त्रियों की तुलना में अधिक अधिकार दिये जाते हैं। समाजीकरण की प्रक्रिया जो समाज द्वारा बच्चे के जन्म के साथ ही शुरू हो जाती है यह भी एक विशेष कारण है, जो लिंग आधारित हिंसा को जन्म देती है। जेन्ड्रीकरण भी एक ऐसी प्रक्रिया है जो जन्म के समय से ही पालन-पोषण में अंतर कर लड़के और लड़कियों को अलग-अलग रूप में ढाल देती है। सामाजिक लिंग भेद भी स्त्री-पुरुष के बीच अन्तर को दर्शाता है। सामाजिक लिंग-भेद की वजह से स्त्रियों एवं पुरुषों के कार्य करने के दायरे निर्धारित किए जाते हैं और यह तय किया जाता है कि कौन-सा काम स्त्रियों के लिए उचित है या अनुचित। ऐसे रूढ़ीवादी वर्जनाओं की वजह से ही हमारे समाज में आए दिन घटीत होने वाली लिंग आधारित हिंसा की स्थिति भयावह होते जा रही है।

स्वरूप

लिंग आधारित हिंसा के विभिन्न स्वरूप हमारे समाज में देखने को मिलता है। सबसे मुख्य रूप से यह घरेलू हिंसा के रूप में घटित होता है जिसे घर के अन्दर रिश्तेदारों या परिवार के सदस्यों द्वारा अंजाम दिया जाता है। इसका एक रूप कन्या भ्रूण हत्या भी है, जिसमें जन्म से पूर्व गर्भ में पल रहे कन्या की हत्या कर दी जाती है–जिसका एक प्रमुख कारण दहेज है।

कन्या शिशु हत्या भी लिंग आधारित हिंसा का एक घिनौना स्वरूप है जिसमें प्रमुख सामाजिक कुरीति दहेज की वजह से जन्म के पश्चात् कन्या शिशु की हत्या कर दी जाती है।

बाल-विवाह कानूनन अपराध है जिसमें छोटी उम्र में ही लड़की-लड़का को शादी के बंधन में बांध दिया जाता है।

दहेज हत्या भी लिंग आधारित हिंसा का एक स्वरूप हैं जिसमें वर पक्ष की माँग पूरी नहीं होने के कारण नवविवाहिता की हत्या सिर्फ दहेज के लिए कर दी जाती है।

सती-प्रथा भी लिंग आधारित हिंसा का एक घिनौना रूप है जिसमें पति की मृत्यु के साथ उसकी विधवा को चिता पर बैठाकर दहन कर दिया जाता है।

किसी भी प्रकार का यौन उत्पीड़न जिसके अन्तर्गत महिलाओं के विरुद्ध किया गया कोई भी दुर्व्यवहार जिससे महिलाओं का यौन शोषण या बालात्कार आदि लिंग आधारित हिंसा का प्रमुख रूप है। पुरुष द्वारा महिला की इच्छा के विरुद्ध उसे डरा-धमकाकर उसके साथ जोर-जबरदस्ती से यौन-शोषण करना या सम्बन्ध बनाना बलात्कार कहलाता है।

वेश्यावृति में स्त्रियों को भोग की वस्तु के रूप में यौन-क्रिया करने के लिए इस्तेमाल किया जाता है। आज भी देश के कई हिस्से में वेश्यावृति एक उद्योग के रूप में फल-फूल रहा है। कम उम्र की लड़कियों से जबरन वेश्यावृति एवं घरेलू काम-काज कराने हेतु किये जाने वाले मानव व्यापार की खबरें भी हमेशा अखवारों की सुर्खियों में जगह बनाये रहती हैं। लिंग आधारित हिंसा का एक स्वरूप डायन प्रथा भी है, जिसमें महिलाओं पर बुरी नजर लगाने का दोष मढ़ दिया जाता है तथा उसे मरने की हद तक शारीरिक-मानसिक प्रताड़ना दी जाती है।

लिंग आधारित हिंसा के कुछ ऐसे दुष्परिणाम हैं जिनसे महिलाओं को गुजरना पड़ता है जिसका सीधा प्रभाव उनके शरीर पर पड़ता है, जिसकी वजह से गम्भीर चोटें, शारीरिक अपंगता, तथा यौन जनित-रोग आदि की समस्याएँ उत्पन्न होने लगती हैं।

लिंग आधारित हिंसा का मनोवैज्ञानिक प्रभाव सबसे ज्यादा महिलाओं को प्रभावित करती है, जिसके फलस्वरूप मानसिक बीमारी, उदासी, एकाकीपन, शर्मिंदगी, हत्या, आत्महत्या आदि करने का नकारात्मक विचार उनके मन में आने लगता है।

इसका गंभीर सामाजिक प्रभाव भी होता है–जिसमें समाज द्वारा अस्वीकृति, घृणा एवं सामाजिक कलंक आदि शामिल है।

लिंग आधारित हिंसा को रोकने तथा महिलाओं को संरक्षित करने के लिए राष्ट्रीय स्तर पर कई कानून बनाए गए हैं जो निम्न हैं :

कानून

'दहेज निषेध अधिनियम 1961' इसके अन्तर्गत दहेज लेने या देने पर पन्द्रह हजार का जुर्माना तथा 6 महीना का कारावास का प्रावधान किया गया है।

'सती विरोधी कानून' 4 दिसम्बर 1829 को लागू किया गया जिसमें यदि कोई महिला अपनी मर्जी से या किसी के दबाव में सती होने का प्रयास करती है तो उसे एक साल की सजा हो सकती है और अपराधी व्यक्ति को मृत्यु दंड, आजीवन कारावास तथा जुर्माने की सजा हो सकती है।

'प्रसव पूर्व निदानिक तकनीकी अधिनियम-1994' में लागू हुआ जिसके अन्तर्गत कन्या भ्रूणों की हत्या को रोकने के लिए सजा का प्रावधान है।

'घरेलू हिंसा अधिनियम 2005' में लागू किया गया जिसके तहत महिलाओं के खिलाफ हिंसा करने वालों को एक साल सजा तथा 25 हजार रुपये जुर्माना हो सकता है।

'यौन उत्पीड़न एक्ट' के अन्तर्गत 376, 377 और 354 के तहत यौन अपराधों के लिए सजा का प्रावधान है।

अत: स्पष्ट है कि राष्ट्रीय स्तर पर लिंग आधारित हिंसा को रोकने के लिए कई कानून बनाए गए परन्तु इसे सही तरीके से समाज में लागू नहीं किया गया है। महिला सुरक्षा संबंधी सारे कानून एवं अदालत तक ही सीमित रह गए जिसके फलस्वरूप हिंसा में कमी आने की जगह इसमें दिन-प्रतिदिन वृद्धि ही होते जा रही है।

अध्ययन पद्धति

प्रस्तुत शोध का अध्ययन पाँच चरणों पर आधारित है

i) अध्ययन की इकाइयों का चयन
ii) अध्ययन क्षेत्र का चयन
iii) अध्ययन के उद्देश्यों का निर्धारण
iv) तथ्यों का संकलन (प्राथमिक एवं द्वितीयक स्त्रोतों के द्वारा)
v) संकलित तथ्यों का वर्गीकरण, सारणीकरण एवं विश्लेषण।

अध्ययन की इकाइयों का चयन

अध्ययन इकाइयों का चयन उद्देश्यपूर्ण निर्देशन के द्वारा किया गया है, जिसके अन्तर्गत 25 महिला तथा 25 पुरुषों को लिया गया है। जिनकी आयु 18-20, 20-22 वर्ष एवं शैक्षणिक स्तर बी०ए० तथा एम०ए० है।

अध्ययन क्षेत्र का चयन

अध्ययन क्षेत्र के रूप में पटना शहर के गाँधी मैदान स्थित मगध महिला कॉलेज तथा बोरिंग रोड स्थित ए०एन० कॉलेज का चयन किया गया है।

अध्ययन का उद्देश्य

अध्ययन का प्रमुख उद्देश्य है:

- लिंग और जेंडर के बीच में अन्तर की जानकारी प्राप्त करना
- महिलाओं के विरुद्ध होने वाली हिंसा की पहचान करना
- महिलाओं के विरुद्ध होने वाली हिंसा किन-किन रूपों में हो रही है, इसकी जानकारी प्राप्त करना
- लिंग आधारित हिंसा के बारे में लोगों की समझ क्या है? इसकी जानकारी प्राप्त करना
- लिंग आधारित हिंसा के कारणों की जानकारी प्राप्त करना
- लिंग आधारित हिंसा के विभिन्न स्वरूपों की जानकारी प्राप्त करना

तथ्यों का संकलन

तथ्यों के संकलन के दोनों स्त्रोतों प्राथमिक एवं द्वितीयक का प्रयोग किया गया है। **प्राथमिक स्त्रोत** के अन्तर्गत अवलोकन, साक्षात्कार, अनुसूची का प्रयोग किया है। **द्वितीय स्त्रोत** के अन्तर्गत किताबों, पत्र-पत्रिका, डायरी, इण्टरनेट इत्यादि का प्रयोग किया गया है। प्राथमिक तथ्यों के संकलन के लिए उद्देश्यपूर्ण निर्देशन विधि के आधार पर अध्ययन ईकाई का चुनाव किया गया है।

संकलित तथ्यों का वर्गीकरण, सारणीकरण एवं विश्लेषण

प्रश्न : हिंसा किसे कहते हैं?

तालिका : 1

विकल्प	महिला	पुरुष	संख्या	प्रतिशत
मारपीट	10	11	21	42%
बलात्कार	01	-	01	02%
कन्या भ्रूण हत्या	03	05	08	16%
मानसिक यातना	11	09	20	40%
कुल	25	25	50	100%

संकलित तथ्यों का वर्गीकरण एवं विश्लेषण के माध्यम से प्रश्नों की एक सूची के द्वारा उत्तरदाता से हमने कुछ प्रश्न किये जैसे हिंसा किसे कहते हैं। प्रश्न पूछे जाने पर 42% उत्तरदाताओं ने मारपीट को, 02% ने बलात्कार को, 16% ने कन्या भ्रूण हत्या को तथा 40% उत्तरदाताओं ने मानसिक यातना को हिंसा बताया।

तालिका : 2

प्रश्न : लिंग आधारित हिंसा किसे कहते हैं?

विकल्प	महिला	पुरुष	संख्या	प्रतिशत
घरेलू हिंसा	05	05	10	20%
यौन उत्पीड़न	03	04	07	14%
दहेज-हत्या	01	01	02	04%
वेश्यावृति	02	03	05	10%
उपर्युक्त सभी	14	12	26	52%
कुल	25	25	50	100%

लिंग आधारित हिंसा किसे कहते हैं? प्रश्न पूछे जाने पर 20% उत्तरदाताओं ने घरेलू हिंसा को, 14% ने यौन उत्पीड़न को, 4% ने दहेज हत्या को, 10% ने वेश्यावृति को तथा 52% उत्तरदाताओं ने इन सभी को लिंग आधारित हिंसा माना है।

तालिका : 3

प्रश्न : लिंग आधारित हिंसा के लिए किन-किन कारकों को जिम्मेदार मानते हैं?

विकल्प	महिला	पुरुष	संख्या	प्रतिशत
पितृसत्ता	12	09	21	42%
समाजीकरण	05	04	09	18%
की प्रक्रिया				
जेन्ड्रीकरण	02	03	05	10%
सामाजिक लिंग भेद	06	09	15	30%
कुल	25	25	50	100%

लिंग आधारित हिंसा के लिए किन-किन कारकों को जिम्मेदार मानते हैं? प्रश्न पूछे जाने पर 42% उत्तरदाताओं ने पितृसत्ता को, 18% ने समाजीकरण की प्रक्रिया को, 10% ने जेन्ड्रीकरण को, 30% उत्तरदाताओं ने सामाजिक लिंग भेद को लिंग आधारित हिंसा के लिए जिम्मेदार कारक माना है।

तालिका : 4

प्रश्न : लिंग आधारित हिंसा के कौन-कौन प्रकार हैं?

विकल्प	महिला	पुरुष	संख्या	प्रतिशत
शारीरिक हिंसा	12	08	20	40%
मौखिक हिंसा	02	03	05	10%
यौनिक हिंसा	04	06	10	20%
आर्थिक हिंसा	03	02	05	10%
उपर्युक्त सभी	04	06	10	20%
कुल	25	25	50	100%

लिंग आधारित हिंसा के अन्तर्गत कौन-कौन प्रकार हैं? प्रश्न पूछे जाने पर 40% उत्तरदाता ने शारीरिक हिंसा को, 10% ने मौखिक हिंसा को, 20% ने यौनिक हिंसा को, 10% ने आर्थिक हिंसा को, 20% ने इन सभी को लिंग आधारित हिंसा का प्रकार माना है।

तालिका : 5

प्रश्न : स्त्री पुरुष के बीच भेद से आप क्या समझते हैं?

विकल्प	महिला	पुरुष	संख्या	प्रतिशत
पुरुष को अधिक प्राथमिकता मिलना	08	07	15	30%
स्त्रियों को किसी तंत्र में निम्न समझना	07	05	12	24%
घर और बाहर के कार्य के लिए स्त्रियों-पुरुषो को अलग	02	03	05	10%
उपर्युक्त सभी	08	10	18	36%

स्त्री-पुरुष के बीच भेद से आप क्या समझते हैं? प्रश्न पूछे जाने पर 30% उत्तरदाताओं ने पुरुष को अधिक प्राथमिकता मिलने को, 24% ने स्त्रियों को निम्न समझने को, 10% घर और बाहर के कार्यों के लिए स्त्रियों-पुरुषों को अलग कार्य देने को तथा 36% उत्तरदाताओं ने इन सभी को स्त्री-पुरुष के बीच होने वाले भेद को इसका कारण बताया है।

निष्कर्ष

i) लिंग स्त्री-पुरुष के बीच पाए जाने वाले शारीरिक अन्तर को स्पष्ट करता है।

ii) जेंडर स्त्री-पुरुष की सामाजिक-सांस्कृतिक रचना है, जिसे समाज ने बनाया है।

iii) समाज में लिंग आधारित हिंसा विद्यमान है और इनके अनेक स्वरूप देखने को मिलते हैं।

iv) लिंग आधारित हिंसा का मुख्य कारण पितृसत्तात्मक समाज में व्याप्त लिंग-भेद, सामाजीकरण की प्रक्रिया, जेन्ड्रीकरण तथा गैर बराबरी है।

सुझाव

i) लिंग आधारित हिंसा को रोकने के लिए हमें सर्वप्रथम महिलाओं को सशक्त, शिक्षित एवं जागरूक करना होगा, ताकि वे अपने अधिकारों को जान सके और उनका उपयोग कर सकें।

ii) महिलाओं को शिक्षित करने के साथ ही रोज़गार की सुविधा देनी चाहिए ताकि वे आर्थिक रूप से आत्मनिर्भर बन सकें।

iii) लिंग भेद से संबंधित परंपरावादी एवं रूढ़िवादी मानसिकता को बदलने की ज़रूरत।

iv) महिलाओं को जागरूक करना होगा ताकि वे अपने आपको शोषण से बचा सकें तथा अपने अधिकारों को समझ सकें।

v) लिंग आधारित हिंसा को रोकने के लिए महिलाओं के साथ-साथ पूरे समाज को जागरूक होना पड़ेगा तभी इसे समाप्त किया जा सकेगा।

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नगरीय परिवेश में परिवार के बदलते प्रतिमान

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सारांश : परिवार समाज की मूल तथा महत्त्वपूर्ण इकाई है, जो व्यक्ति के विकास में सहयोग देता है । परिवार ही ऐसी संस्था है जिसके माध्यम से व्यक्ति नियमबद्ध रूप से अपनी जैविकीय जरूरतों को पूरा कर सकता है। परिवार एक जैविकीय प्राणी को सामाजिक प्राणी के रूप में परिवर्तित करता है। अर्थात् परिवार वह उदगम स्थान है, जिसमें भविष्य का जन्म होता है, वह शिशु गृह है, जिसमें व्यक्तित्त्व का निर्माण होता है। औद्योगिकीकरण एवं नगरीकरण के विकास ने आज परिवार की परिभाषा ही बदल दी है।

शब्द कुंजी : जैविकीय, औद्योगिकीकरण, नगरीकरण

परिचय

सामाजिक संस्थाओं में परिवार का प्रमुख स्थान है । परिवार समाज की मुख्य आधारशिला है। समाज की पहली संस्था परिवार है, जिसके अन्तर्गत हर व्यक्ति को प्रथम शिक्षा प्रदान की जाती है। साथ ही परिवार मानव की अनेक सामाजिक, सांस्कृतिक आवश्यकताओं की पूर्ति का साधन है। इस प्रकार परिवार समाज का सबसे उच्च संस्था है।

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गेराल्ड लिसले ने 1982 में परिवार को दो रूपों में परिभाषित किया है–जो सामाजिक मान्यता प्राप्त यौन संबंध स्थापित करता है और साथ में अनेक बच्चे या गोद लिए हुए बच्चे भी होते हैं उसे ही परिवार कहते हैं। परिवार में बच्चे का पूर्ण सामाजीकरण होता है, जिससे वह एक सामाजिक व्यक्ति बन पाता है। परिवार हर समाज की मूल तथा महत्त्वपूर्ण इकाई है, जो व्यक्ति के विकास में सहयोग प्रदान करता है। परिवार में हर शिशु का पालन–पोषण एवं उसकी सुरक्षा की व्यवस्था होती है । साथ ही परिवार बड़े–बुढ़े सभी को सुरक्षा एवं स्थायित्व प्रदान करता है। परिवार में ही बच्चे सामाज की संस्कृति सीखते हैं। परिवार के अलावा समाज में कोई दूसरी संस्था नहीं है, जहॉ हमें एक जैविकीय प्राणी को सामाजिक प्राणी बनाने में सहयोग प्रदान किया जाता है।

भारत जैसे देश में परिवार जैसी संस्था का महत्त्वपूर्ण स्थान है। भारतीय परिवार के सदस्य एक–दूसरे के साथ सेवा–भाव एवं सद्भावना पूर्वक निवास करते हैं। भारत की प्रमुख विशेषता 'संयुक्त परिवार प्रणाली' है । संयुक्त परिवार से तात्पर्य है– ऐसा परिवार जिसके अन्तर्गत दो से तीन पीढ़ी के सदस्य एक साथ निवास करते हो, एक रसोई में बने भोजन करते हो और एक साथ पूजा–पाठ में सम्मिलित होते है । संयुक्त परिवार हमारे जीवन व समाज में बहुत अधिक महत्त्व रखता है। संयुक्त परिवार भारतीय समाज का आधार स्तम्भ है।

संयुक्त परिवार के अन्तर्गत पितृसत्ता व्यवस्था पाई जाती है। पितृसत्ता अर्थात् जहाँ सत्ता पुरुषों के हाथों में होती है। संयुक्त परिवार में पितृसत्तात्मक व्यवस्था होने के कारण महिलाओं के उत्पादन एवं श्रम शक्ति पर पुरुष का प्रभाव होता है। वर्तमान समय में परिवार का स्वरूप

संयुक्त की जगह एकांकी होता जा रहा है। एकांकी परिवार के अन्तर्गत पति-पत्नी एवं उनके बच्चे होते हैं। इस परिवर्त्तन का प्रमुख कारण औद्योगिकीकरण और पश्चिमीकरण है। औद्यौगिकीकरण के कारण पेशों में बहुलता आई और ज्यादा तर व्यक्ति अपने गाँव को छोड़कर नगरों में प्रवास करने लग। इस प्रकार संयुक्त परिवार विघटित होकर एकांकी परिवार में परिवर्तित हो रहा है। एकांकी परिवार में जहाँ महिलाओं की दशा में सुधार हुआ है वहीं एकांकी परिवार एक बच्चे के सही विकास में बाधा बन रहा है। इस प्रकार संयुक्त एवं एकांकी दोनों परिवार के कुछ गुण भी है और अवगुण भी है।

नागरीय परिवार या एकांकी परिवार की विशेषताऐं :

i) स्त्रियों की परिस्थिति में सुधार

ii) धार्मिकता और आध्यात्मिकता की कमी

iii) औपचारिकता अथवा औपचारिक संबंधों में वृद्धि

iv) सहयोगपूर्ण व्यवहार का अभाव

v) अनुशासन और नियंत्रण में कमी

vi) पारिवारिक महत्त्व में कमी

vii) बड़े-बूढ़ों के सम्मान का अभाव

उपर्युक्त परिचर्चा के आधार पर आज परिवार के बदलते प्रतिमान को देखते हुए उनकी स्थिति का प्रसार किया गया है।

अध्ययन का उद्देश्य

प्रस्तुत शोध 'नगरीय परिवेश में परिवार के बदलते प्रतिमान' एक सामाजिक शोध है। अनेक उद्देश्यों को लेकर यह शोध किया गया है, जो निम्नांकित है :

i) परिवार के प्रकार की जानकारी प्राप्त करना

ii) समाजीकरण में परिवार की भूमिका की जानकारी प्राप्त करना

iii) परिवार में बच्चों के प्रति हो रहे व्यवहार का पता लगाना

iv) परिवार के प्रकार एवं महिलाओं की दशा का पता लगाना

v) परिवार की संख्या में हो रहे बदलाव की जानकारी प्राप्त करना

vi) परिवार पर पश्चिमीकरण, औद्योगिकीकरण के प्रभाव का पता लगाना

अध्ययन पद्धति

अध्ययन पद्धति का तात्पर्य उस प्रणाली से है, जिसे एक शोधकर्ता अपनी अध्ययन की विषय वस्तुत के संबंध में निष्कर्ष निकालने के लिए उपयोग में लाता है। इस शोध के अन्तर्गत तथ्यों का संकलन निम्न स्त्रोतों द्वारा किया गया है :

i) प्राथमिक स्त्रोत

प्राथमिक स्त्रोत से तात्पर्य उन सभी मौलिक सूचनाओं या आंकड़ों से है, जिन्हें स्वयं अनुसंधानकर्ता वास्तविक अध्ययन स्थल में जाकर समस्या से संबंधित जीवित व्यक्त्यिों से साक्षात्कार प्रश्नावली या अनुसूची की सहायता से एकत्रित करता है, प्राथमिक स्त्रोत कहलाता है।

प्राथमिक स्त्रोत में निर्देशन प्रणाली और अनुसूची का प्रयोग किया गया है।

ii) द्वितीय स्त्रोत

द्वितीयक स्त्रोत का तात्पर्य किसी भी ऐसे प्रलेखों या विवरण से है, जो अध्ययनकर्ता के अतिरिक्त किसी अन्य व्यक्ति या संगठन द्वारा प्रस्तुत किया गया है।

इस शोध में विषय से संबंधित विविध पुस्तकों, पत्रिकाओं, समाचार-पत्रों का प्रयोग किया गया है।

निर्देशन

निर्दशन एक विस्तृत समूह का लघुत्तर प्रतिनिधि है। इस शोध में उद्देश्यपूर्ण निर्देशन का प्रयोग किया गया है।

उद्देश्यपूर्ण निर्देशन

अध्ययनकर्त्ता किसी विशेष उद्देश्य को सामने रखते हुए अपनी इच्छानुसार समग्र में से कुछ इकाइयों का चयन करता है, तो ऐसे निर्देशन को उद्देश्यपूर्ण निर्देशन कहा जाता है। इस अध्ययन पद्धति की सहायता से शोधकार्य आसान हो पाया है।

अध्ययन क्षेत्र का चयन

अध्ययन का क्षेत्र पटना शहर के कुम्हरार स्थित संदलपुर तथा पटेल कॉलोनी के परिवार को लिया गया है।

तथ्यों का वर्गीकरण एवं विश्लेषण :

i) व्यक्तिगत सूचना लिंग के आधार पर

ii) उत्तरदाता के आयु के आधार पर

iii) शिक्षा के स्तर पर उत्तरदाता का विवरण

iv) परिवार की प्रकृति व्यक्ति आधार पर

v) परिवार की प्रकृत्ति में बदलाव(संयुक्त एवं एकांकी)
vi) परिवार की प्रकृत्ति में बदलाव
vii) परिवार के सदस्यों पर सामाजिक एवं पितृसत्ता का प्रभाव
viii) संयुक्त परिवार का सहयोगी व्यवस्था है
ix) संयुक्त परिवार मूल्यों में गिरावट को रोक सकता है
x) एकांकी परिवार में व्यक्तित्व का सही विकास होता है
xi) संयुक्त परिवार में पितृसत्ता को बढ़ावा मिलता है
xii) पितृसत्ता एंव पारिवारिक संबंध
xiii) दाम्पत्य जीवन के लिए जिम्मेदार कारक
xiv) श्रम विभाजन

तालिका : 1

परिवार की प्रकृति व्यक्ति आधार पर

परिवार	महिला	पुरुष	कुल
संयुक्त	12	10	22
अर्द्धसंयुक्त	6	3	9
एकांकी	10	9	19
कुल	28	22	50

तालिका–1 में परिवार की प्रकृति का अध्ययन किया गया है। जिसमें परिवार का वर्गीकरण तीन तरह से किया गया है । कुछ संयुक्त, कुछ अर्द्धसंयुक्त तथा कुछ एकांकी परिवार है। कुल शोध से 50 साक्षात्कार अनुसूची के द्वारा चयन किये गये महिला एवं पुरुषों का चुनाव किया गया।

तालिका : 2

परिवार की प्रकृति में बदलाव संयुक्त एवं एकांकी			
संयुक्त परिवार से क्या समझते हैं ?	महिला	पुरुष	कुल
पति–पत्नी, बच्चे एवं अन्य	6	4	10
पति–पत्नी, बच्चे एवं माता–पिता	15	8	23
पति–पत्नी, बच्चे एवं भाई का परिवार	7	6	13
कुल	28	22	46

तालिका 2 के अन्तर्गत 50 महिलाओं एवं पुरुषों (उत्तरदाताओं)से जानकारी प्राप्त किया गया । इस शोद्य में संयुक्त परिवार के प्रति आज के युवा पीढ़ी का एक नया नज़रीया देखने को मिलता है।

तालिका : 3

परिवार की प्रकृति में बदलाव

आजकल परिवार की संख्या में बदलाव	महिला	पुरुष	कुल
एकांकी परिवार पति–पत्नी केवल	16	15	31
एकांकी परिवार	4	2	6
महिला प्रधान परिवार	2	3	5
कुल	22	20	42

तालिका–3 में महिलाओं एवं पुरुषों को शोध कार्य के लिए चयन किया गया । आज परिवार के बारे में लोगों का नज़रीया बदल रहा है।

निष्कर्ष एवं सुझाव

समाज में आज परिवार का स्वरूप बदल रहा है। शोध का उद्देश्य बदलते स्वरूप को जानना और समझना है। निष्कर्ष के रूप में यह स्पष्ट है कि हमने दोनों परिवार की तुलनात्मक व्याख्या की है तथा जिसमे अध्ययन के लिए वैज्ञानिक पद्धति का प्रयोग किया गया है।

निष्कर्षत: यह पाया कि भारतीय परिवार का स्वरूप संयुक्त परिवार का रहा है। इस संयुक्त परिवार के स्वरूप में आज परिवर्त्तन आ गया है, तथा यह संयुक्त परिवार एकांकी परिवार में बदलता जा रहा है। इस प्रकार एकांकी परिवार में वर्तमान में अनेक समस्याएँ हो रही हैं। परिवार का विघटन हो रहा है, जिससे समाज में भी समस्याऐं बढ़ रही हैं।

निष्कर्षत:, शोध अध्ययन के आधार पर समाज के हित के लिए संयुक्त परिवार को बनाये रखना ही हितकारी माना गया है।

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ELDER ABUSE AND NEGLECT AT HOME : IT'S TIME TO FACE THE REALITY

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ABSTRACT : *As would be true of most of us who grew up in the 1960s in large joint families, our grandparents always enjoyed centre-stage; they were consulted by their adult children, loved and respected by their grandchildren. In less than five decades, however, we have seen much of this respect for elders wither away. The traditional norms and values of Indian society laid stress on giving respect to social, psychological and economic security in turn the elderly have contributed acquired wisdom, accumulated wealth and maintained family harmony. In other words, this relationship has been symbiotic such, a system of mutual support however, is facing headwinds in a modern day society. Even in rural areas- long considered the repository of our deeply ingrained values- the changing family patterns with younger people migrated to cities in search of work, a large number of elders are being left alone, ill-equipped to meet the debilitating effects of advanced age. In urban areas, adults find themselves so preoccupied with work and the stress of city life, that they unwittingly leave unattended a large, silent population of lonely, frightened elders who are bereft of support- financial, medical or emotional.*

KEYWORDS : Consulted, Traditional, Contributed, Family Harmony, Preoccupied

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INTRODUCTION

Human life is normally divided into five main stages namely- infancy, childhood, adolescence, adulthood and old age. In each of these stages an individual has to find himself in different situations and face different problems. The old age is not without problems. In old age physical strength deteriorates, mental stability diminishes; money power becomes bleak coupled with negligence from the younger generation.

People age 60 or above are considered elderly or senior citizens. Elderly abuse has been described as intentional action that cause harm or risk of harm or as a caregiver's failure to satisfy the basic needs and safe living condition of elderly. It includes physical abuse, negligence, financial exploitation, Psychological abuse etc. However, due to changing family structure and modernization elderly population is facing inevitable challenges to live their life respectfully. According to them a phenomenon called 'Grand Dumping' is becoming common in urban areas these days as children are being increasingly intolerant of their parents health problems. After a certain age health problems begin to crop up leading to losing control over one's body,

even not recognizing own family owing to Alzheimer are common in old age. It is then children began to see their parents as burden. They are these parents who at times wander out of their homes or are thrown out. Some dump their old parents or grandparents in old age homes and don't even come to visit them anymore. Elder abuse is complex problem whose incidence, causes and remedies remains the subject of controversy in our society. It is a phenomenon which encompasses different types of behaviors-violence, neglect, and exploitation.

Sebation and Sekhar (2011) studied only four types of abuse i.e., physical, verbal, or psychological, financial exploitation, and neglect. He has conduct research study of three hundred respondent in which 61.3% were women and rest of them were of man and data taken from all three categories i.e., young-old, old and old, and form all categories of economic class.

Pillemer and Wolf (1986) studied elder abuse: conflict in the family two major themes have emerged out form this study the first is the general one the theories of elder abuse that relate it to relationship between abuser and victim, were generally supported. It was also found that chronic economic stress and stressful life events played only a small role in abusive situations. To make our study more reliable and scientific we followed some stages of research

HYPOTHESIS

Hypothesis of this study is to see the percentage of elder abuse by their own in our society. personal experience of abuse by elderly and abusers. Although our main objectives is to see the percentage of who abused more at home.

PURPOSE

The main purpose of the study is to measure the level of elder abuse by their own. Reporting behavior of elder abuse and awareness of currently available intervention mechanisms.

METHODOLOGY

We have used several methods in our project. Both primary and secondary sources of data were gathered for the study. Secondary source included documents, books, pdf. The methodology is designed with a combination of qualitative and quantitative research tools.

RESEARCH TOOLS

The techniques used in this study are detailed below:

- **Sample :** As a sample we have taken area study of NGO's like help age India, park etc.
- **Schedule:** it will be presented by the interview where by questions will be asked and the answer noted down by him

According to a recent study, sensitizing children and strengthening inter generational bonding has been reported as the most effective way to deal with abuse by the elderly. Most of the elderly added that increasing economic independence of the abused and sensitizing young adults is an effective way to deal with the abuse. There are 81 million older people in India. According to an estimate nearly 40% of senior citizens living with their families are reportedly facing abuse of one kind or another, but only 1 in 6 cases actually comes to light. With one-third of those affected putting it on top list, mistreatment or misbehavior is the most common form of abused faced by elderly in India, according to our study. As many as affected respondents said restriction in their social life by their family members faced by them and according to secondary study daughter-in-law is reported by 59.09% as the main perpetrator of abuse and very closely followed by son 22.72%. 13.63% abusers are family members and left 4.54% respondents were abused by their grandchildren. Although the president has given his assent to the maintenance and welfare of parents and senior citizens act which punishes children who abandon parents with a prison term of three months or a fine, situation is grim for elderly people in India.

FACTS

- In almost 90% of elder abuse and neglect incidents, the perpetrator is a family member. 2/3of perpetrator are adult children
- For every reported incidents of elder abuse, 5 others go unreported
- Most victims are dependents on their abuser basic needs

SUGGESTIONS

The elderly themselves must be made aware of possible threats to them so that they take cautionary measures. First, when police engage in community partnership it enhances the level of police presence among the elderly, thus police presence can reduce the fear among the elderly. Second reason is that as police becomes more actively involved with elderly, security satisfaction will rise among the elderly and it is believedthat if elderly have higher satisfaction with the police, they will have less fear of crime. Senior citizens cells should be established by police in every police head quarter of district. Police should pay attention to security of life and property of elderly who are living alone. Police should punish those family members, who abuse and neglect the elderly.

i) Elder Abuse Awareness : To ensure that older Indian live with dignity and honor and free from abuse, neglect and exploitation.

Keeping your elderly loved ones safe is easier when we planned for in advance.

Pay attention to what they say so you can notice if things change.

ii) Laws : Art 41 right to work to education and to public assistance in certain case: the state shall, within the limits of economic capacity and development, make effective provision for securing the right to work, to education and to public assistance in cases of unemployment, old age, sickness and disablement , and other cases of undeserved want.

iii) Role Of Government : The government of India approved the national policy for older person on January 13, 1999 in order to accelerate welfare measures and empowering the elderly in way beneficial for them.

The policy included the following measure steps:

i) Setting up of a pension fund for insuring security for those persons who have been serving in the unorganized sector.

ii) Construction of old age homes and day care centers for every 3-4 districts.

iii) Establishments of resource centers and re-employment bureaus for people above sixty years.

iii) Concessional rail/air fares for travel and between cities, example 30% discount in train and 50% in Indian air lines.

CONCLUSION

After this study we conclude that old age is a stage of life that no one can jump. Elder abuse will remain as an age-old problem brought to light with only a dim ficker. Elder Abuse deserves the attention due to it so that this problem is illuminated by research that will prevent elder abuse among an aging population and provide more effective interventions for those affected by this plague and against our elderly.

Older people to adjust to the needs and changed circumstances of the younger generation can be done, and likewise, the youngsters can be taught to be more considerate towards their elders. Counseling could thus prove to be an important component of family therapy and the end result could be beneficial for both the younger as well as the older generation.

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