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Editors

Dr. Ebey P. Koshy
Dr. Joshy Varghese
Mr. Jose James

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**St. Joseph's College, Moolamattom
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Editorial

The second volume of Josephine Researcher brings together quality research material with keen blend of innovation, creative insight, and presentation of unique knowledge documented with precise and meticulous attention serving the institution's ideal of eminence and excellence in avenues of higher education.

This volume becomes a treasured collection of scholarly research articles authored by the estimable Faculty of St. Joseph's college from diverse disciplines. The journal offers a trajectory of guidance to the academic community including future researchers, teachers and students making available rich potential of information within affordable reach. It acts as a platform for an in-depth analysis of issues, comments and concerns on different scientific, social, ethical and literary discourses.

As the new volume is unveiled to the academic community, the editorial team extends gratitude to the contributors and supporters of this endeavour.

Without the sagacious vision and ardent leadership of Rev. Fr. Sebastian Elanjickal CML, Provincial, St. Joseph's Province, the second volume of Josephine Researcher would not have been a reality. We are very much grateful to be the beneficiaries of the magnificent charisma at the helm of our missions. We are very fortunate to be inspired by the leadership of our College Local Manager and Chairman of the Advisory Board Rev. Dr. Jose Nedumpara CML. His ideals have greatly been helpful in bringing

out the journal with keen insistence on quality and profound depth. We are thankful for the farsighted guidance and persistent motivation of our College Principal Dr. George V. Thomas behind all the efforts regarding the publication of this volume. The dynamic cooperation and corrective interventions of our College Bursar Fr. Libin Vallyparambil CMI has been of great strength for us in the shaping of the final volume.

The present issue includes five research articles from science, two from social science, one from commerce and four from literature. We believe this volume will positively ignite new sojourns and unfathomable quests towards the realms of true cognizance.

Dr. Ebey P. Koshy

Dr. Joshy Varghese

Mr. Jose James

Table of Contents

1. Supreme Court Judgment on Sabarimala :
Legal Implications
Jose J Nedumpara 9
2. ✓ Fabrication of toughened plastic through semi-Interpenetrating Polymer Networks of Styrene butadiene rubber-Poly [methyl methacrylate]
Jose James, George V. Thomas and Sabu Thomas 18
3. ✓ Microwave Assisted Oxidation Reactions Using EGDMA –Cross-linked Polyvinyl pyrrolidone-Bromine Complex
Saju M. Sebastian, Beena Mathew, Ebey P. Koshy 30
4. ✓ A review on cytotoxic and antimicrobial Applications of noble metal-nanoparticles
Sijo Francis, Ebey P. Koshy, Beena Mathew 44
5. Almeyathaude Akhosham Beninja Kavthakalil
Joshy Varghese 57
6. Micro-finance and Micro credit for sustainable Business
Thomas George V. 68
7. Carbon Trading: Green Signal to Green Earth
Joseph George, Rose Mary Baby 77
8. The Nostalgic Nomenclature of Eateries: A Cultural Reading of the Names of Street Food Stalls in Kerala
Roby Mathew 84

9. Manu Bhandari ki Kahani 'Akashke Ayine mem',
chithrith Nari Samasyayem
Sobhiha Sebastian 94
10. Kumar Ambuj ki Kavitha mem Uttaradhunikatha
Jesty Emmanuel 98
11. Anxiety, Depression and Stress among
Recovering Alcohol Dependent Individuals
in Kerala
*Alan Gigi, Mathew Joseph Kanamala,
Justine Joseph* 105
12. Crystal Growth and Nonlinear Optical
Properties of Guanidinium Carbonate Single
Crystals for Optical Limiting Applications
Jesby George, Praveen Joseph, Anju P Mathews 115
12. Synthesis and application of Nanoparticles- A
Biological Approach
Anjana V N, Beena Mathew, Ebey P Koshy 120
14. Surface Modification of Polymeric Membranes
by Layer by Layer Assembly of Polyelectrolytes
*Jain Maria Thomas, C.T. Aravindakumar,
Usha K. Aravind* 137
15. T. Padmanaphante Kadhakalile Manavikatha
Tegy K. Thomas 153

Supreme Court Judgement on Sabarimala : Legal Implications

Dr. Fr. Jose Nedumpara

Article 25 of the constitution of India guarantees to every citizen the right to freedom of religion. He has the right to profess, practise and propagate the religion of his choice. The constitution upholds the principal of "secular state" which means there shall not be any 'state religion' or 'state sponsored religion' in India.

India under the constitution is a secular state. India is a secular state which observes an attitude of neutrality and impartiality towards all religions. A secular state is founded on the principal that the state is concerned with the relation between Man and Man and not with the relation between man and god which is a matter of individual conscience. The state shall treat all religions and religious groups equally and with equal respect without interfering in any manner with their individual right of religion, faith and worship.

The attitude of impartiality and neutrality towards all religions is secured by the constitution by several provisions¹

Firstly there shall be no "state religion" in India. The state will not confer any special patronage upon any particular religion. It postulates that

a) The state will not compel any citizen to pay any taxes for the promotion or maintenance of any particular religion or religious institution.²

b) No religious instruction shall be provided in any educational institution wholly provided by state funds.

c) Religious instruction may be imparted in private educational institutions recognized by or receiving aid from the state. But no

person attending such institution shall be compelled to receive that religious instruction without the consent of himself or of his/her guardian in the case of pupil who is a minor.

Secondly, every person is guaranteed the freedom of conscience and the freedom to profess, practise and propagate his own religion subject to;

- A) Restrictions imposed by the state in the interests of public order, morality and health.
- B) Regulations or restrictions made by the state relating to any economic, financial, political or other secular activity which may be associated with religious practice, but do not really appertain to the freedom of conscience.
- C) Measures for social reform and for throwing open of Hindu religious institutions of a public character to all classes and sections of Hindus.

Thirdly, not only is there the freedom of the individual to profess, practise and propagate his religion, there is also the right guaranteed to every religious group or denomination.³

- a) To establish and maintain institutions for religious and charitable purposes.
- b) To manage its own affairs in matters of religion.
- c) To own and acquire movable and immovable property and
- d) To administer such property in accordance with law

It is to be noted that this guarantee is available not only to the citizens of India but to all persons including aliens.

The ambit of the freedom of religion guaranteed by articles 25-26 has been widened by the judicial interpretation that what is guaranteed by article 25 and 26 is the right of the individual to practise and propagate not only matters of faith or belief but also all those

rituals and observances which are regarded as integral parts of a religion by the followers of its doctrines.⁴

Each religious denomination or organization enjoys complete autonomy in the matter of deciding as to what rites and ceremonies are essential according to the tenets of the religion they hold.⁵ Regulation by state again cannot interfere with things which are essentially religious.⁶ But the court has the right to determine whether a particular rite or observance is regarded as essential by the tenets of a particular religion and to interfere if a particular practice offends against public health or morality or not being an essentially religious practice, contravenes any law of social, economic or political regulation.⁷

The supreme court in a landmark judgement, lifted the centuries old prohibition on women to enter the famed sabarimala temple in Kerala. The supreme court bench headed by Chief Justice Deepak Mishra in a majority opinion of 4:1, said, the prohibition reduced the freedom of religion to a 'dead letter' and the ban was a smear on the individual dignity of women.⁸

The prohibition in sabarimala on women was founded on the notion that menstruating women are polluted and impure, that women in the 'procreative stage', would be a deviation from the vow of celibacy taken by the male devotees of Lord Ayyappa for the pilgrimage. Besides the deity in sabarimala is himself 'naishtika brahmachari' or an eternal celibate.

Chief Justice Deepak Mishra held that the ban was actually a product of hegemonic patriarchy religion. This ban exacts more purity from women than men. The ban is discriminatory.⁹ Justice D. Y Chandrachud, in his separate but concurring opinion said, to suggest that women cannot keep the 'vratham' (vow of celibacy), is to stigmatize them and stereotype them as being weak and lesser human

beings. A constitutional court must refuse to recognize such claims.¹⁰

Justice Chandrachud termed the social exclusion of women, based on menstrual status, a form of untouchability.¹¹ The judge observed that notions of purity and pollution stigmatized individuals. To exclude women was derogatory to an equal citizenship.

It is assumed that the presence of women would deviate the celibacy and austerity observed by the devotees. Such a claim cannot be a constitutionally sustainable argument. Its effect is to impose the burden of man's celibacy on a woman and construct her as a cause for deviation from celibacy.

This is then employed to deny access to spaces to which women are equally entitled, Justice Chandrachud rationalized.¹²

A deity in a temple does not have constitutional rights. Fundamental rights are meant for individuals, not for deities or idols, Justice Chandrachud said, countering the argument that the right to preserve the celibacy of the deity in the sabarimala temple is a 'protected constitutional right', which extends to excluding women from the temple.¹³

Indu malhora wrote a separate judgement, dissenting with the majority to open up sabarimala temple for women that the judges should not impose their personal views in respect of the form of worship of a deity.¹⁴ In a pluralistic society, the followers of various sects have the freedom to practise their faith in accordance with the tenets of their religion. Notions of rationality cannot be invoked in matters of religion by courts, she said. It is irrelevant whether the practice is rational or logical. She held that the manifestation is in the form of a 'naishthik brahmachari'. The belief in a deity, and the form in which he has manifested himself is a fundamental right protected by article 25 (1) of the constitution of India.¹⁵

She said the prohibition in vogue for time immemorial qualified to be an 'essential practice'. A religion can lay down a code of ethics, and also prescribe rituals, observances, ceremonies, and modes of worship. Imposing the court's morality on a religion would negate the freedom to practice one's religion according to one's faith and beliefs. It would amount to rationalizing religion, faith and beliefs, which is outside the ken of courts, Justice Malhotra observed.¹⁶

Justice Indu Malhotra held that India is a country comprising diverse religions, creeds and sects, each of which have their faiths, beliefs and distinctive practices. Constitutional morality in a secular polity would comprehend the freedom of every individual, group, sect, or denomination to practise their religion in accordance with their beliefs and practices.¹⁷

Justice Malhotra upheld the status of Ayyappa devotees as a separate religious denomination. She banked on the notifications issued by the Travancore Devasom Board in 1955 and 1956 which refer to the devotees as 'Ayyappans'.¹⁸ She argued that the worshippers of Lord Ayyappa together constitute a religious denomination or sect thereof as the case may be, follow a common faith and have common beliefs and practices. The worshippers constitute a religious denomination or sect thereof, as the case may be, following the 'Ayyappan Dharma'. They are designated by a distinctive name wherein all male devotees are called 'Ayyappans', all female devotees below the age of 10 and above the age of 50 are called 'Malikapurams'. A pilgrim in his maiden trip is called 'Kanni Ayyappan'. The devotees are referred to 'Ayyappa swamis'. A devotee has to observe 'The vratham' (vow of celibacy) and follow a code of conduct, before embarking upon the 'Pathinettu padikal' (18 steps) to enter the temple

In 1951 the Bombay High Court in the state of Bombay versus Narasu Appa Mali case had delivered the judgement that personal law, religious customs, usages and beliefs are outside ambit of fundamental rights of equality, life and dignity.¹⁹ The decision in Narasu case declared that personal law is immune from constitutional scrutiny. Personal law is not 'law' or 'laws in force' under Article 13. The 1951 judgement was never challenged in the Supreme Court. In the Sabarimala case the Supreme Court held that no body of practices can claim supremacy over the constitution and its vision of ensuring the sanctity of dignity, liberty and equality. Those activities that are inherently connected with the civil status of individuals cannot be granted constitutional immunity merely because they may have some associational features which have a religious nature, Justice Chandrachud held.

Adv.Mathews Nedumpara counsel for the petitioner, Adv.Shylaja Vijayan, the secretary for All India Ayyappa Devotees Association argues that devotees of Lord Ayyappa of Sabarimala, women and men, believe and follow the faith that Lord Ayyappa is a Naishitika Brahmachari, who does not desire women of menstruating age to enter the shrine. The abode of Lord Ayyappa which is deep inside the forest in Sabarimala, amply proclaims that he wants to keep away from the people. He wants to be an eternal celibate (Naishitika Brahmachari). Hence he wants to keep himself away from the young women, between the ages of 10 – 50. This is the belief system which lakhs of devotees of Lord Ayyappa, both Men and women want to uphold and preserve. A belief system is beyond reason or rationality and hence should not be questioned in a secular court of law.

The restriction in Sabarimala is not a gender discrimination but a restriction on the basis of age. The women who are the age

group of 10 – 50 usually do not go to Sabarimala to have 'Darsan' of Lord Ayyappa. It is a tradition followed by the women devotees of Ayyappa. The women of Kerala haven't complained against this long established tradition. The devotees of Lord Ayyappa and in particular the women devotees of menstruating age, too consider the aforesaid judgement of the Supreme Court which is in conflict with command of Lord Ayyappa is a violation of their freedom of conscience, belief, faith and worship guaranteed by the constitution. The secular court need not interfere in the matters of faith which are not reasonable or logical in relation to legal concepts. The people have the freedom to hold a faith or belief which is not reasonable at all.

The judgements of the Supreme court are laws of the land and citizens are bound by them and the only means of correction thereof is a review on a limited ground under Article 137 of the constitution which is to be heard in chambers and further corrections thereof by way of curative petition.

Those who opposed the entry of women argue that unless the custom or religious right is so obnoxious the court cannot interfere with such rights. The character of the deity as an incarnation of God at the time of 'prathishta', is a Naishitik Brahmachari, and this character cannot be changed. The deity will neither see women the age of 10 – 50, nor will women see the deity.²⁰

The petitioners who seek Review Petition argue that the judgement erroneously imported the concept of untouchability under Article 17 of the constitution without understanding the historical context. The exclusion is a general one and women are not excluded on the basis of caste, gender or religion. The exclusion is merely on the basis of age. The exclusion is within the class of women and that is to protect the character of the deity.

Adv. Parasaran who represented Nair service society in the Supreme Court argue that the constitutional morality is a subjective test which should not be applied in matters of faith. Religious beliefs cannot be tested on the basis of rationality. The right to worship has to be exercised in consonance with the nature of deity and essential practice of the temple.²¹

Senior counsel Adv. V Giri appearing for the Sabarimala 'tantiri' (chief priest) argue that the exclusion of women has nothing to do with physiological character of women. There are thousands of Ayyappa temples in India which do not have this system and this practice is being followed only in Sabarimala temple. It is the duty of the 'tantiri', to preserve and protect the essential religious practices in Sabarimala.²²

Shekhar Naphade, advocate for parties seeking a review of the Supreme Court judgement, holds that it is not the jurisdiction of a Court to decide what essential part of a religion is and it has to be decided by the community of believers.²³

The pertinent question is whether the apex court should interfere in the matters of faith which are not at all reasonable. There are many critics who hold the opinion that so many cases which affect the lives of the common people are pending in the court for adjudication. Why should the court interfere in these kinds of unnecessary issues and waste its precious time. Majority of the women in Kerala and India do not consider the Sabarimala faith issue a serious matter to be considered by the Supreme Court

End Notes

1. The Constitution of India, Article 25-28
2. The Constitution of India, Article 27
3. The Constitution of India, Article 26
4. Hanif Quareshi Vs State of Bihar case, AIR, 1958, Supreme Court 731

5. Ibid
6. Ratilal Vs State of Bombay, 1954, SCR (Supreme Court Records) 1055
7. Sarup Vs State of Punjab, AIR, 1959 SCR 860
8. The Hindu (Kochi), September 29, 2018
9. Ibid.
10. Ibid.
11. Times of India (Kochi), September 29, 2018
12. The Hindu, Ibid
13. Ibid.
14. Ibid.
15. Ibid.
16. Deccan Chronicle (Thiruvananthapuram), September 29, 2018
17. The Hindu, Ibid
18. Ibid.
19. Ibid.
20. Deccan Chronicle (Thiruvananthapuram), February 7, 2019
21. Ibid.
22. Times of India (Kochi), February 7, 2019
23. Ibid.

Fabrication of toughened plastic through semi-Interpenetrating Polymer Networks of Styrene butadiene rubber-Poly [methyl methacrylate]

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Abstract

A classic set of semi-interpenetrating polymer networks (semi-IPNs) have been fabricated using the judicious selection of a pair of thermoplastic and an elastomer with effective interpenetration between them. Semi-IPN based on styrene butadiene rubber (SBR) and poly [methyl methacrylate] (PMMA) has been fabricated by sequential polymerization technique. The different mechanical properties of semi-IPNs are investigated in detail. Tensile toughness values of semi-IPNs are evaluated and their chemistry is explained. Morphological analysis of semi-IPNs through SEM provides clear insight of their component distribution in it. This protocol of characterization in semi-IPN can definitely act as a platform for designing of new toughened plastic with low cost and facile fabrication protocol.

Key Words: IPN, semi-IPN, Toughened plastic, Mechanical properties

INTRODUCTION

Multi component polymeric systems [1] have a specific role in the broad canvas of Material science. Interpenetrating polymer networks (IPNs) and semi-IPNs are special type of polymer blends [2] with specific features and potential applications [3]. IPNs are defined as networks where two components are cross-linked but not to each other [4]. If one component adopts linear fashion, then it is called semi-IPN [5]. The cross-linked phase of semi-IPN usually exists as continuous phase [6]. IPN can show synergistic effect of their component polymers and consequently avoid their limitations to considerable extent. Normal mixing of two or more polymers/co-polymers does not lead to the creation of an IPN.

Sequential polymerization, simultaneous polymerization and latex blending methods are the common protocols [7] employed in the manufacture of semi-IPNs. Nature of components with their cross-link densities, blend ratio and tunable morphology are major controlling factors in semi-IPN domain [8]. The two characteristic features of IPNs that distinguishes itself from the other types of multiphase polymer systems are as follows: (a) IPNs swell but do not dissolve in solvents and (b) creep and flow are suppressed in IPNs. Three dimensional interlocked network structure of semi-IPN provide certain degree of compatibility between their components, even though they are incompatible [9] and as a result, the final system possess smaller domain size [10] than those of corresponding mechanical blends.

A number of articles [11, 12] had been present in the literature dealing with different preparation protocol [13] and characterization strategies [14, 15]. Aji. P. Mathew [16] successfully explained the Morphology, Mechanical Properties, and Failure-Topography of Semi-Interpenetrating Polymer Networks based on Natural Rubber and Polystyrene.

In this article, a novel set of semi-IPN membranes have been prepared from poly methyl methacrylate (PMMA) and styrene butadiene rubber (SBR) by adopting sequential polymerization protocol. By the judicious interpenetration of SBR and PMMA by sequential polymerization technique, we have prepared a series of low cost semi IPNs based membranes. Correlation between mechanical and morphological features of semi-IPN is very relevant and this is the novelty of our work.

2. Experimental

2.1. Materials

Styrene butadiene rubber (Synaprene 1502) with 25% styrene content was used for this study was supplied by Indian Synthetic Rubber Limited (ISRL). Dicumyl peroxide (DCP 99%) and benzoyl peroxide (BPO) were purchased from Aldrich and used as such. Methyl methacrylate (MMA, Aldrich) was freed from inhibitor and used.

2.2. Preparation of semi-IPNs

SBR was masticated in a two-roll mixing mill at room temperature. It was mixed with DCP (1/2/3phr) in a two-roll mixing mill at room temperature as per ASTM standards. In the preparation of semi-IPN using cross-linked PMMA phase, the following method has been adopted. Vulcanized SBR sheets of definite weight and of thickness (2mm) were immersed in a homogeneous mixture of MMA and BPO (the concentration of BPO was based on the MMA content) for different time intervals. As a result, we get swollen samples with different weight percentages of MMA. To get an equilibrium distribution of MMA monomer in the matrix, swollen samples were kept at 273 K for three hours.

These SBR sheet was kept in between two stainless steel plates inside an oven at 353K for 16 h for polymerization. Afterwards,

the rubber sheet was vacuum dried to constant weight. The unreacted MMA monomers were removed by treatment under reduced pressure. By this technique, we could synthesize a series of flexible semi-IPNsheets. SBR/PMMA semi-IPNs with PMMA content up to 70% were prepared. Preparation of semi-IPN can be schematically represented as follows.

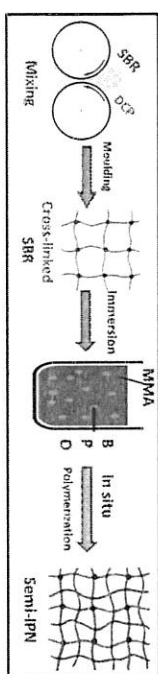


Fig.1: Scheme of Preparation semi-IPN.

The semi-IPNs can be represented as $^a\text{SBR}^c\text{D}^d$ (a indicates weight of DCP per 100 gram of SBR rubber, S indicates SBR rubber, B stands for BPO as the initiator for polymerization of PMMA, P represents PMMA, c indicates weight percentage of PMMA, D stands for Divinyl benzene [DVB], d corresponds to wt. % of DVB content).

The composition of different semi-IPNs employed for Mechanical characterization can be summarized as follows.

Table 1: Composition of Semi-IPNs

Type of semi-IPN	DCP (Phr)	Weight % of PMMA and SBR in the IPN	DVB (wt. %)
$^1\text{SBR}_{30}\text{D}_0$	1	30:70	0
$^1\text{SBR}_{50}\text{D}_0$	1	50:50	0
$^1\text{SBR}_{70}\text{D}_0$	1	70:30	0

2.3 Mechanical Properties Tensile Properties

Tensile strength (TS) and elongation at break (EB %) were measured using a tensile testing machine at a crosshead speed of 50 mm/min. The TS measurements were done using dump bell

specimens, at room temperature, as per the ASTM D-412 test method.

Hardness

The Shore A hardness was measured using a Durometer for the semi-IPNs.

Density

The density of the samples was measured at room temperature using the hydrostatic technique according to ASTM D-792.

2.4. Microscopic analysis

The morphology of semi-IPNs was studied using JOEL-JEM 2010 model scanning electron microscope. The samples were cryogenically fractured, sputtered with gold and examined under microscope.

3. Results and Discussions

3.1. Mechanical Properties

Mechanical analysis is one of the important tools in semi-IPN characterization. The deformation Pattern of each semi-IPN under an applied stress is clear from the Fig: 2.

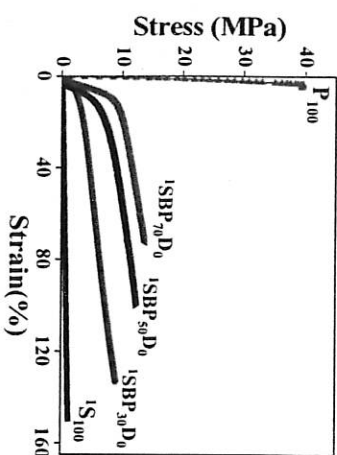


Fig: 2 Stress-strain curves for semi-IPNs.

The deformation tendency of SBR (S_{100}) is of typical elastomer in nature. On the addition of PMMA, the deformation pattern changes. The gradual change from the rubbery to the plastic nature can be clearly visualized, as we moving from 30 to 70 wt % of PMMA in the stress-strain curve. Semi-IPN with 70% PMMA ($1SBR_{70}D_0$) shows the typical plastic curve. Semi-IPN with 70% SBR ($1SBR_{30}D_0$) shows a rubbery nature. For samples where the PMMA content is greater than or equal to 50%, a yield point was observed.

When the PMMA content goes above 50%, the stress-strain curves show distinct elastic and inelastic regions. In the elastic region, yielding was observed. On increasing the plastic content, the rubbery nature decreases and a necking tendency characteristic of plastics appears. The brittle type behavior was shown by Pure PMMA (P_{100}). The effect of blend ratio on mechanical properties of semi-IPN can be summarized in the following Table (II).

Table II Effect of Composition on Mechanical Properties

Composition	Density (g/cc)	TS (MPa)	EB (%)	Young's Modulus	Hardness (Shore A) ± 3
$1S_{100}$	0.95	1.24 ± 0.3	149.16 ± 12	1.74	42
$1SBR_{30}D_0$	1.01	9.06 ± 0.5	133.11 ± 11	6.50	76
$1SBR_{50}D_0$	1.04	12.25 ± 0.6	99.99 ± 6	15.16	80
$1SBR_{70}D_0$	1.09	13.85 ± 0.7	73.90 ± 4	22.34	83
P_{100}	1.19	39.6 ± 1.3	3.58 ± 0.6	2166.12	-

The TS and elongation at break (EB %) of different semi-IPNs with different SBR/PMMA compositions are given in Table II. In all cases, the TS values were found to increase on the addition of PMMA to SBR. The following diagram represents SEM images of semi-IPN (at higher magnification) with PMMA concentration varies from 30 to 70%.

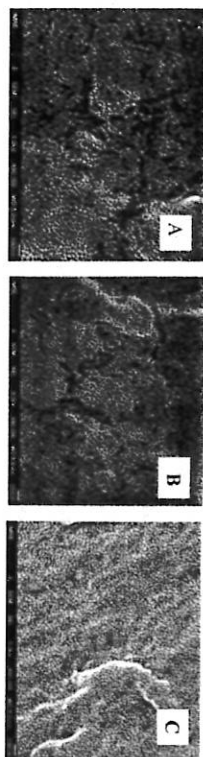


Fig. 3 Scanning Electron micrographs of (A) ${}^1\text{SBP}_{30}\text{D}_0$, (B) ${}^1\text{SBP}_{50}\text{D}_0$ and (C) ${}^1\text{SBP}_{70}\text{D}_0$

In the case of sequential semi-IPNs, cross-linking of the first formed phase (here SBR) has an upper hand in controlling the morphology [17]. This is clearly understood from the above SEM images. Here cross linking of SBR matrix is kept constant (${}^1\text{S}$). As the PMMA content in semi-IPN enhances from 30 to 70%, it adopts much smaller, ordered and compact PMMA phase and as a result, we get more interconnected co-continuous pattern. Density of given samples are represented in Table II. Density of semi-IPN specimens increases with increase in PMMA content. It was found that Shore A values (from Table II) increased with increasing PMMA content.

Tensile toughness expresses the ability of a material to absorb mechanical energy up to the point of failure [18]. Its value can be measured as the area under the stress-strain curve. The toughness value of semi-IPNs can be summarized in the following table.

Table III Toughness values of Samples	
Composition	Toughness ($\times 10^{-7} \text{ Jm}^{-3}$)
T_{100}	95
${}^1\text{SBP}_{30}\text{D}_0$	620
${}^1\text{SBP}_{50}\text{D}_0$	852
${}^1\text{SBP}_{70}\text{D}_0$	447

From the above table, it is clear that, as the PMMA content in a given set of semi-IPN enhances, toughness value increases up to composition with 50% PMMA. Afterwards, toughness of semi-IPN decreases and is due to the enhancement of brittle plastic [19] content in it.

As we go through the Fig. 2, it is clear that stress-strain curve of ${}^1\text{SBP}_{50}\text{D}_0$ narrates the behavior of a strong and tough polymer. That is semi-IPN with 50:50 ratio of SBR and PMMA show synergistic effect [20] of weak elastomer and strong brittle plastic. ${}^1\text{SBP}_{30}\text{D}_0$ shows more similarity to elastomeric nature, while ${}^1\text{SBP}_{70}\text{D}_0$ show more similarity to brittle character. ${}^1\text{SBP}_{70}\text{D}_0$ depicts a condition of strong polymer, but it is less tough than ${}^1\text{SBP}_{50}\text{D}_0$. The tendency in toughness value for semi-IPNs can be depicted in the following bar diagram.

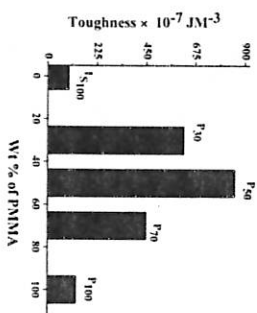


Fig. 4 Tensile Toughness of semi-IPNs with varying PMMA content.

Semi-IPN with 50:50 composition ratio (${}^1\text{SBP}_{50}\text{D}_0$) is a potential candidate for toughened plastic with reasonable values in tensile strength, elongation at break and modulus value.

2. Conclusions

New classes of semi-IPN multi component polymeric systems are developing from SBR and the Methyl Methacrylate

monomer by the sequential method via *in situ* polymerization. These specialized blends have a very ordered and compact arrangement of the two phases. The peculiarity of the major component is ultimate deciding factor in the specifications of resultant semi-IPNs. The effective and low cost polymer blend formed from SBR and PMMA by the interpenetration technique having a wide range of mechanical properties starting from reinforced plastic to toughened elastomer. It is found that in all cases as the PMMA content increases the TS, density, modulus and hardness increase. The EB % values decrease due to decrease in the elasticity of the material with a decreasing SBR content. It is also concluded that the system shows a continuous morphology above 50% PMMA with enhancement of properties. As the plastic content in network blend enhances, the distance between two adjacent PMMA distribution decreases and resulted in more homogenous, close packed morphology.

Among semi-IPNs, the maximum toughness value is shown by system with intermediate blend ratio (50:50) of SBR and PMMA. The effects of plastic incorporation in SBR phase was analyzed by morphological technique SEM and is correlated with mechanical data. A low cost thermoplastic-elastomer semi-IPN with a caliber to perform as a toughened plastic with reasonable mechanical properties and co-continuous morphological pattern is fabricated and characterized in this work.

Conflicts of interest

There are no conflicts to declare.

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Microwave Assisted Oxidation Reactions Using EGDMA - Crosslinked Polyvinylpyrrolidone-Bromine Complex

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Abstract

A microwave assisted method for the oxidation of alcohols employing 3% ethylene glycol dimethacrylate (EGDMA) crosslinked polyvinylpyrrolidone - bromine complex (PVP-Br) in a solvent free condition is reported. Primary and secondary alcohols are easily converted into the corresponding carbonyl compounds using PVP-Br complex under microwave condition. A thermal comparison for each reaction was also carried out in order to get a clear understanding about the influence of microwave irradiation on the reaction yield. The effect of microwave power on the rate of oxidation and the stability of PVP-Br reagent under microwave conditions were also studied.

Key words: microwave assisted, polyvinylpyrrolidone, oxidizing reagent, polymer-supported, functionalized polymer

1. Introduction

Application of polymer-supported reagents in organic synthesis has grown over the years due to its convenient handling and easy work up procedures. But the main drawback of polymer-supported reagents is that the reaction kinetics is generally slow

compared to solution-phase chemistry. This is due to the necessity for the reactant to diffuse through the polymeric network in order to come in contact with the reagent, only at which point can the reaction take place. This limitation can be overcome to a certain extent by doing polymer-supported reactions under microwave irradiation [1]. Chemists are increasingly looking for a strategy that would combine the advantages of microwave and polymer assisted organic synthesis.

Microwave assisted and polymer-supported organic syntheses have emerged independently as a versatile tool for rapid generation of organic molecules. A massive number of research publications have appeared over the last decades in the application of microwave techniques in organic synthesis such as pericyclic [2], cyclization [3], aromatic and nucleophilic substitution [4], oxidation [5], alkylation [6], decarboxylation [7], condensation [8], peptide synthesis [9], acylation [10], cycloaddition [11], deprotection and protection [12], and heterocycles [13]. Some of the major advantages include spectacular decrease in reaction time, improved conversions, clean product formation and wide scope for the development of new reaction conditions. Besides these advantages, the uses of solvent free microwave irradiated procedures for organic synthesis have attracted considerable interest in recent years due to their efficient and environmentally benign conditions [14].

Here we report a facile method for oxidation of alcohols to carbonyl compounds using EGDMA-crosslinked polyvinylpyrrolidone-bromine (PVP-Br) complex, under solvent free condition via process that is accelerated by microwave irradiation and compared it with reactions carried out under conventional method of heating.

2. Experimental

2.1. Materials

N-Vinylpyrrolidone was purchased from Merck, Federal Republic of Germany. Ethylene glycol dimethacrylate (EGDMA) was purchased from Aldrich U.K. Other organic compounds were commercially available samples and were purified by distillation or recrystallization unless otherwise stated. IR spectra were recorded on a Shimadzu FTIR-8400S spectrophotometer. UV spectra were recorded using Shimadzu UV-2450 spectrophotometer. GC-MS analysis were carried out on a Shimadzu GC 17 A equipped with QP5050 mass spectrophotometer having EI detection. All microwave experiments were performed using an Onida Powersolo 20 microwave oven.

2.2. Preparation of 3% EGDMA-crosslinked poly (N-vinylpyrrolidone)

To a solution of 0.46 g of 10% aqueous solution of sodium dibasic phosphate and 40g of sodium sulphate in 240 ml of water heated to 50-65°C, a solution of N-vinylpyrrolidone (10.84 g), EGDMA (0.6 g) and AIBN (0.12 g) were added. The mixture was heated with stirring to 70 - 80°C for 5 h. The product polymer obtained was filtered, washed with water, methanol and acetone and dried at 60°C. It was further purified by Soxhlet extraction with methanol and acetone and dried at 60°C. Yield : 9.1 g

2.3. Preparation of polyvinylpyrrolidone-bromine (PVP-Br) complex

To a suspension of EGDMA-crosslinked PVP (5 g) in CCl_4 (20 ml), bromine (5 ml) was added and stirred on a magnetic stirrer at room temperature for 4 h. The product polymer obtained was filtered and washed with CCl_4 until the filtrate was completely free

from bromine and dried to afford orange red complex.
Yield: 7.1 g.

2.4. Stability of PVP-Br under microwave irradiation

The stability of 3% EGDMA-crosslinked polyvinylpyrrolidone-bromine complex towards microwave irradiation was investigated by subjecting the complex (1g) to microwaves for different time periods (2, 4, 6, 8 and 10 minutes) at a microwave power level of 320 W. After each time period, a definite amount of the polymeric reagent was taken out and its bromine capacity was estimated iodometrically [15].

2.5. Effect of microwave power level on the rate of oxidation using PVP-Br complex

In order to study the effect of microwave power level on the rate of oxidation reaction, the oxidation of benzoic acid to benzil was taken as the model reaction. 1 mmol of benzoic acid was dissolved in dichloromethane and mixed with 5 mmol (based on bromine capacity) of the polymeric reagent at room temperature in a 50 ml borosil beaker. After removing the solvent by applying vacuum, the polymeric reagent along with adsorbed substrate was subjected to microwave exposure at a power level of 80W for 10 minutes. The impregnation of the polymeric reagent with benzoic acid in dichloromethane and removal of the solvent was repeated after every two minutes of irradiation. The reaction was carried out in cycles of 2 minutes of irradiation. After 10 minutes of irradiation the reaction mixture was cooled and a calculated volume of cyclohexane (10 ml) was added. 0.5 ml of reaction mixture was pipetted out into a 5 ml standard flask and made up to the mark. The absorbance of this solution was measured spectrophotometrically at 387nm. From the absorbance the percentage of benzil formed was calculated. The same reaction was repeated by using other microwave power levels

also, ranging from 160 to 800 W.

2.6. Effect of impregnation of the polymeric reagent with substrate on the rate of oxidation

In order to study the effect of impregnation of the polymeric reagent with substrate on the rate of oxidation, a fivefold molar excess of the reagent was impregnated with a solution of benzoin in dichloromethane in a 50 ml borosil beaker. After removing the solvent, the polymeric reagent along with absorbed substrate (benzoin) was irradiated with microwaves at a power level of 320W. The impregnation of the polymeric reagent with benzoin in dichloromethane followed by removal of the solvent was repeated after every two minutes of irradiation. The same oxidation reaction was also carried out by impregnating the polymeric reagent after every 3, 4 and 6 minutes of irradiation. After 12 minutes of irradiation, the reaction mixture was cooled and a calculated volume of cyclohexane (10 ml) was added. 0.5 ml of reaction mixture was pipetted out into a 5 ml standard flask and made up to the mark. The absorbance of the solution was measured spectrophotometrically at 387 nm. From the absorbance the percentage of benzil formed was calculated.

2.7. Oxidation of alcohols under microwave condition

General Procedure

A five-fold molar excess of PVP-Bromine complex is mixed with organic substrate (100mg) dissolved in dichloromethane in a 50 ml borosil beaker. The solvent is then removed by applying vacuum and the polymeric reagent along with adsorbed low molecular weight substrate was subjected to microwave irradiation for 10 minutes at a microwave power of 320 W. Impregnation of the polymeric reagent with substrate solution and removal of the solvent was repeated after every two minutes of microwave irradiation. The progress of the reaction was followed by TLC and

after 10 minutes of irradiation, the reaction mixture was cooled, the product was extracted with dichloromethane (3 x 15 ml) and isolated by filtration. Evaporation of the solvent afforded the corresponding oxidized organic compound. The products were identified and characterized by comparison of IR, GC-MS, boiling point (b.p.) and melting point (m.p.) with authentic samples.

2.8. Oxidation reactions using PVP-Br complex under conventional heating conditions: General procedure

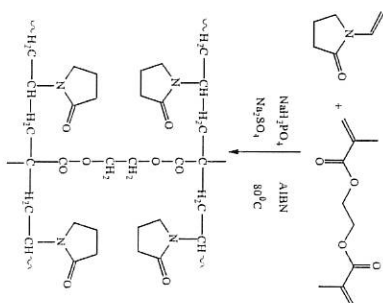
Synthetic reactions under conventional heating methods were carried out by refluxing polyvinylpyrrolidone-bromine complex with substrate molecules dissolved in cyclohexane in the molar ratio of 5:1 for 5 h. The reaction was followed by thin layer chromatography. After heating for 5 h, the insoluble crosslinked polymeric reagent was filtered off and washed with more cyclohexane. The combined filtrate and washings on evaporation of the solvent followed by purification afforded the product. The products were identified and characterized by comparison of IR, GC-MS, boiling point (b.p.) and melting point (m.p.) with authentic samples.

3. Results and Discussion

3.1. Preparation of 3% EGDMA-crosslinked polyvinylpyrrolidone

The EGDMA-crosslinked polyvinylpyrrolidone was prepared by suspension polymerization of the monomers N-vinylpyrrolidone and EGDMA, using AIBN as initiator (Scheme 1).

The polymer was characterized by FTIR spectroscopy. A peak at 1665 cm^{-1} shows the amide carbonyl of the pyrrolidone unit. The peak at 1292 cm^{-1} is the C-N stretching of the vinylpyrrolidone.



Scheme 1. Preparation of EGDMA-crosslinked polyvinylpyrrolidone

3.2. Preparation of crosslinked PVP-Br complex

The PVP-bromine complex is obtained by a simple one step procedure which involves the complexation of bromine with crosslinked polyvinylpyrrolidone which can release in situ bromine species in to the reaction media. Bromine was added slowly into a suspension of polyvinylpyrrolidone in carbon tetrachloride with stirring at room temperature. The resultant orange red reagent on filtration and washing with carbon tetrachloride yielded a stable non-hygroscopic product. The bromine capacity of the reagent was determined by iodometric titration and found to be in the range of 2.9 – 3.1 mmol of bromine per gram of the polymeric reagent. The IR spectrum showed a shift in the absorption of carbonyl group from 1665 cm^{-1} to 1645 cm^{-1} showing the involvement of carbonyl group in bromine complexation [16].

3.3. Stability of PVP-Br under microwave irradiation

One of the undeniable drawbacks of the use of polymer-supported reagents is that the reaction kinetics is generally slower compared to traditional solution-phase chemistry. This drawback

can be minimized to a large extent by performing polymer supported reactions under microwave conditions. But one of the major concerns when using microwave heating in solid phase synthesis is the stability of polymer-bound linkers and reagents to these conditions. In order to study the stability of 3% EGDMA-crosslinked PVP-Br to microwave irradiation, a definite amount of the reagent was taken in a 50 ml borosil beaker and subjected to irradiation for different time periods (2, 4, 6, 8, and 10 minutes) at a microwave power of 320W. After each time period, a definite amount of the reagent was taken out and its bromine capacity was determined iodometrically. The bromine capacity was found to be 3.07, 3.06, 3.05, 3.03, 3.02 and 3.01 mmol per gram of the reagent after 0, 2, 4, 6, 8 and 10 minutes of microwave irradiation. The results showed that there is not much loss in bromine capacity even after 10 minutes of microwave exposure and the reagent is suitable for performing synthetic reactions under microwave condition.

3.4. Effect of microwave power on oxidation reaction

To study the effect of microwave power on oxidation reactions using PVP-Br, the oxidation of benzoin to benzil was taken as the model reaction. For this, a fivefold molar excess of the polymeric reagent was impregnated with benzoin dissolved in dichloromethane. The solvent was removed by applying vacuum and the polymeric reagent with adsorbed substrate molecules was then subjected to microwave irradiation for 10 minutes. The different microwave power levels used ranges from 80-800W. Impregnation of the polymeric reagent with substrate molecules by adding dichloromethane and removal of the solvent was repeated after every two minutes of irradiation for proper accessibility of the reactive function present in the polymeric reagent to the low molecular weight substrate molecule. The percentage of benzil formed in each case was determined spectrophotometrically. The different microwave

power levels used were 80, 160, 240, 320, 400, 480, 560, 640, 720 and 800 W and the percentage of benzil formed were 8.3, 21.2, 35.5, 60, 34.2, 16.1, 8.3, 5.5, 5.1 and 4.8 respectively. The results showed that oxidizing efficiency of the reagent increased upto a microwave power of 320 W and then decreases. The decrease in the percentage of benzil at a microwave power level of 400 W and above may be due to the sudden release of bromine from the polymeric reagent due to the high temperature attained at these power levels

3.5 Effect of impregnation of the polymeric reagent with substrate molecules

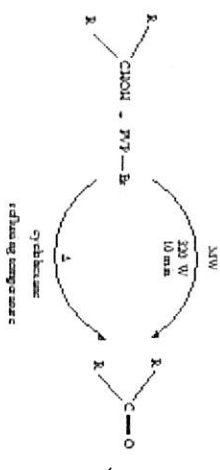
In solid state reactions mixing of the polymeric reagent with low molecular weight substrates dissolved in an appropriate solvent is very essential for the effective accessibility of the reactive function present in the polymeric reagent to the low molecular weight substrate molecules. The effect of impregnation of the polymeric reagent with substrate molecule was studied by using the oxidation of benzoin to benzil as the model reaction. A fivefold molar excess of the polymeric reagent taken in a 50 ml borosil beaker was impregnated with a solution of benzoin in dichloromethane followed by removal of the solvent. The polymeric reagent along with adsorbed benzoin was subjected to microwave irradiation at a microwave power of 320 W. The impregnation of the polymeric reagent with benzoin solution in dichloromethane and removal of the solvent was repeated after every two minutes of irradiation. After 12 minutes of irradiation, the percentage of benzil formed was calculated spectrophotometrically. Similar reactions were also done by impregnating the polymeric reagent with benzoin solution after 3, 4 and 6 minutes of irradiation. The number of dead time (no irradiation) given in these cases were 3 (after every 3 minutes), 2 (after every 4 minutes) and 1 (after 6 minutes of irradiation) respectively. The results showed that the

amount of benzil formed when no dead time was given (only initial impregnation with benzoin solution) was 20 %. But when impregnation was done after every 2, 3, 4 and 6 minutes of irradiation the percentage of benzil formed were 70, 52, 41 and 25 respectively. From these studies it is very clear that before microwave irradiation, effective mixing of the polymeric reagent with substrate molecules dissolved in a suitable low boiling solvent is very essential for proper accessibility of the bromine function present in PVP-Br, as the reactions were carried out in solid state.

3.6. Oxidation of alcohols

Crosslinked polyvinylpyrrolidone-bromine complex can be used for the preparative level oxidation of primary and secondary alcohols to the corresponding aldehydes and ketones respectively (Scheme 2). The synthetic reactions using PVP-Br were carried out under microwave condition and also under conventional thermal heating condition. In microwave condition, the reactions take place in the solid phase, and the products are then extracted from the reaction mixture using an appropriate solvent. In solvent free or 'dry media' synthesis, solid support capable of absorbing microwave radiation is first impregnated with a solution of substrate in a volatile solvent. After removing the solvent, the solid support with adsorbed substrate is irradiated by microwaves. The exposure of polymeric reagent along with adsorbed substrate to microwave irradiation can result in fast and high yielding reactions because of the selective absorption of microwave energy by polar molecules. Moreover it will save reaction time significantly and diminish the risk of damage to the resins caused for example by magnetic stirring. In each case a thermal comparison for each reaction was also carried out by performing reactions under conventional heating conditions. This allows the influence of the microwave irradiation on the reaction

yield to be better understood. In conventional thermal heating, the reactions were carried out by refluxing a solution of low molecular weight substrate in cyclohexane with five-fold molar excess of the reagent for 5h.



Scheme 2. Oxidation of alcohols into carbonyl compounds

In a typical microwave assisted reaction, a five-fold molar excess of the polymeric reagent, taken in a 50 ml borosil beaker was impregnated with a solution of the organic substrate in dichloromethane. The solvent was then removed by applying vacuum and the polymeric reagent along with adsorbed substrate was subjected to microwave irradiation for 10 minutes. Impregnation of the polymeric reagent with substrate solution by adding dichloromethane and removal of the solvent was repeated after every two minutes of microwave irradiation for effective accessibility of the reactive function present in the polymeric reagent to the low molecular weight substrate molecule. The synthetic reactions were carried out at a microwave power level of 320 W. All the synthetic reactions under microwave condition were carried out in cycles of 2 minute of irradiation. The extent of conversion of substrate to product was followed at different time interval by thin layer chromatography. After 10 minutes of irradiation, the reaction mixture was cooled and extracted with dichloromethane, filtered, and washed with dichloromethane. The combined filtrate and washings on evaporation of the solvent afforded the product. The various alcohols oxidized by the reagent, the products formed, the yields and

conditions of oxidation are given in Table 1. In the case of primary alcohols no over-oxidation to carboxylic acids was observed. The products were characterized by comparison of the physical and spectral characteristics with authentic specimens.

The results revealed that reactions conducted under microwave condition dramatically enhances the reaction rates and achieves high conversion within minutes compared to reactions conducted under conventional thermal conditions in the presence of cyclohexane solvent. This might be because microwaves couples directly with the molecules of the entire reaction mixture, leading to a rapid rise in temperature. However conventional heating is a slow and inefficient method of transforming heat energy into the reacting system because the heat driven into the substance first passes through the wall of the vessel before reaching the solvent and reactants

The spent reagent obtained after different oxidation reactions can be recycled and reused by washing with dichloromethane followed by treatment with bromine in CCl_4 as explained in the original procedure for the preparation of the polymeric reagent.

Table 1. Oxidation of alcohols using PVP-Br complex under microwave activation (MW) and classical heating

Entry	Substrate	Product	Yield % MW + Δ^a
1.	1-phenylethanol Bromine	acetophenone Benzil	60 62
2.	Benzyl alcohol	Benzaldehyde	63 59
3.	1-phenylethanol Benzylidene	benzophenone Benzophenone	63 58
4.	4-nitrobenzyl alcohol	4-nitrobenzaldehyde	67 69
5.	3-nitrobenzyl alcohol	3-nitrobenzaldehyde	62 64

^a All microwave assisted reactions were carried out at 320 W for 10 minutes in cycles of 2 minutes.
^b All classical reactions were performed in cyclohexane at refluxing temperature for 5h.
^c Product yield.

4. Conclusion

PVP-Br complex is a stable and recyclable oxidizing reagent. Under microwave conditions, the reagent efficiently oxidizes primary and secondary alcohols to the corresponding carbonyl compounds within short times, resulting in good yield and clean products. Moreover, it is a convenient and environmentally benign oxidative protocol when compared to the conventional solution phase or heterogeneous reactions.

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A review on cytotoxic and antimicrobial applications of noble metal nanoparticles

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Abstract

The uses of metal nanoparticles as therapeutical agents have been known from ancient times. Recently, noble metal nanoparticles have demonstrated their potential biomedical applications towards anticancer and antimicrobial fields. This review discusses the toxicity of selected cancerous and microbial cells the metal nanoparticles. The challenges in the targeted drug delivery are also briefly analyzed here.

Introduction

Cancer is the immoderate proliferation of abnormal cells. World Health Organization (WHO) stated cancer as the second top detrimental disease suffered by humanity. The uncontrolled cell division results in two types of mass of cells; benign and malignant tumours. The first type usually developed in a localized manner and the second type spread towards adjacent tissues by a process known as metastasis and was harmful to life. The causes of this mutagenic disease were genetic factors, chemical carcinogens, exposure to radiations, and tumour viruses. The modern food habits and lifestyle patterns lead to an increase in the number of cancer patients all over the world.

Chemotherapy, radiotherapy, and surgery are three classical treatment procedures for cancer. The various cytotoxic drugs functioned by suppressing the tumour genes, inhibiting the activity of cancer-promoting proteins selectively, killing the affected cells, inhibiting the formation of new blood vessels, etc. The surgical removal of cancerous cells was attempted during the initial stages of tumor development. In radiation therapy, a precise radiation dose is used to kill cancer cells. The ionizing radiation breaks the chemical bonds in the biological components of the cell proteins and nucleic acids and it lacks specificity. The treatment destroys both normal and cancerous cells.

Nanoparticle drug delivery systems emerged with new hope in cancer treatment. Gold nanoparticles were able to illuminate and destroy the cancerous tissues selectively by mechanism known as hyperthermia [6]. Dielectric properties possessed by nanogold proposed a better means for the fabrication of cancer detection devices [9]. Biocompatible fluorescent gold nanoparticles synthesized using egg-white can be used to track cancerous cells in the *in-vitro* and *in-vivo* imaging process [1]. Gold nanoparticles prepared using the seaweeds can be used in the drug delivery systems and they can destroy the deadly cancer cells without affecting cell proliferation of healthy cells [2]. The mutagenic modifications like the hydroxylation of bases adenine and guanine resulted from the oxidative attack on the DNA [3].

Cytotoxicity of silver and gold nanoparticles against various cancerous cells offer a remedy for this mutagenic diseases [4], [5]. Silver nanoparticles synthesized under sunlight in the presence of wall-less green microalgae *Dunaliella salina* showed anticancer potential comparable to that of the well known anticancer drug cisplatin [7]. Recent review admired the usefulness of gold

nanoparticles in the diagnosis and photothermal destruction of various malignant cancerous cells [6]. *Azadirachta indica* reduced silver and gold nanoparticles proved its cytotoxic effect against MDA-MB-231 cells and offer a novel drug for the human breast carcinoma [5]. The anticancer activity of silver and gold nanoparticles synthesized using aqueous leaf extract of *Spinacia oleracea* Linn against mouse myoblast cancer cells (C2C12) has been proved by MTT assay [7]. The microwave-assisted gold nanoparticles which were prepared using the coconut water as reducing agents proved its cytotoxicity against human cervical cancer (HeLa) and human breast cancer (MCF-7) cell lines [8]. *Dracocephalum kotschy* leaf extract reduced gold nanoparticles showed a dose-dependent cytotoxicity K562 and HeLa cell lines [9]. Various cancerous cells can be destructed by gold nanoparticles prepared from the very common fruit *Psidium guajava* (guava) and the spices *Syzygium aromaticum* (clove). It is found that the flavonoid content was responsible for their anticancer properties [10].

A549 is the human lung adenocarcinoma cells used for the *in-vitro* anticancer studies using the nanoparticles. The green-synthesized silver nanoparticles using leaf extract of the industrial crop *Gossypium hirsutum* (cotton) showed significant and selective cytotoxicity towards the human lung carcinoma A549 and exhibited no toxicity towards the normal cells HBL100 [11]. Stable silver nanoparticles formed from *Albizia adianthifolia* leaf extract proved their toxic effects on the human lung cancer cells A549 and were non-toxic on the human peripheral lymphocytes (PLs) [12]. Biosynthesized gold nanoparticles using star anise (*Illicium verum*) because of its high phenolic content, found toxic towards the human epithelial lung cells (A549) [13]. Skin cancers are the growth in the outer layer of the skin. The common types are melanoma, basal cell cancer and the squamous cell cancer. The malignant melanoma

involves rapid proliferation of cells. The flavonoid Licochalcone D present in the root of *Glycyrrhiza inflata* have proved cytotoxic activities towards the human skin cancer cell A375 [14]. Silver nanoparticles were precipitated from AgNO_3 solution by adding the crude ethanolic extracts of certain medicinal plants that were used in homeopathic medicine as mother tinctures. The silver nanoparticles offered an easy entry into skin cancer cells A375 and induce the cell death by apoptosis as cleared from the flow cytometric analysis [15]. PEGylated amino pyrimidines coated with gold and silver nanoparticles were evaluated for anticancer activity against human bone osteosarcoma epithelial Cells [16].

Antimicrobial activity

Antimicrobials are drugs that counteract infectious diseases. Plant-derived medicines are safer than the synthetic ones. Crude extracts of medicinal plants have bioactive compounds and they have the ability to fight against disease-causing microbes. The growth of pathogenic microorganisms was efficiently inhibited by the biosynthesized noble metal nanoparticles [17]. The large surface-to-volume ratio of inorganic metal nanoparticles offers new hopes in the development of antimicrobial drugs. Resistances of microorganisms towards conventional antibiotics have been increasing day-by-day and have challenged the scientific fraternity to develop new drugs with superior antibacterial properties. Antibacterial coats of silver nanoparticles were implemented clinically as wound dressing materials, bandages, catheters etc [18]. The spherical silver nanoparticles which were prepared in a single step reaction using the fruit extract of *Tribulus terrestris* and showed antimicrobial activity against clinically isolated multi-drug resistant pathogens [19]. Silver nanoparticles joined with commercial antibiotics enhanced their antimicrobial activity [20]. Silver nanoparticles are proved their antibacterial and antifungal power

against various human disease-causing pathogens [21].

Mechanism of microbial action

The action of silver and gold nanoparticles towards gram-positive and gram-negative bacteria were different due to the difference in their cell membrane structure. The gram-positive bacterial membrane has more peptidoglycan layer than gram-negative bacteria (50 %). This factor contributed to the lesser zone of inhibition created by gram-positive microorganisms [22]. The mechanism of the antibacterial activity of green silver nanoparticles and the anticancer activity of green synthesized gold nanoparticles are explained in the recent review [23]. The key steps in the antimicrobial action are the reduction of the membrane potential along with the reduced energy of the cell as the amount of Adenosine triphosphate (ATP) synthase has depleted. The activities of the cell, especially the metabolic processes become retarded. Again the binding of the ribosome with tRNA has been affected adversely and the number of healthy cells has gone decreased. The high surface area of silver and gold nanoparticles owing to their small particle size has also contributed to their increased reactivity. The small particle size provided the better surface contact between the nanoparticles and the microbial cells. The cell wall of bacteria has undergone rupturing and the proteins in the cytoplasm stopped their proper functioning which ultimately leads to cell death. The phosphorus and sulfur containing moieties in the cell (Proteins, DNA) were easily bonded with the silver and gold nanoparticles via soft-soft interactions defined by the Pearson's HSAB concept of preferential bonding. Bonding with sulfur groups of the enzyme NADH created oxidative stress to the respiratory chains. This also damaged the cell structure and inhibited its proper functioning [24]. The growth inhibition of pathogenic organisms with silver nanoparticles is affected by its effective disturbance in the polymer subunits which subsequently

block the protein synthesis [25].

The antifungal activity of silver and gold nanoparticles were found significantly less than the antibacterial activity in potato agar dextrose media. Respiration of bacterial cells happened through the cell membranes. By adsorbing at the cell surface, the silver and gold nanoparticles obstruct the dehydrogenation action. Whereas for fungi, the respiration is through the mitochondrial membrane. It is hard for nanoparticles to penetrate through the mitochondrial membrane and block the respiration of cells. The outcome is the low value for the fungal activity. Silver nanoparticles can effectively break up the fungal growth. The cell wall of fungal stains is made up of the high molecular weight polymer of fatty acids and proteins. The cell membrane of fungal stains undergoes tremendous changes when it is treated with nanoparticles.

Water disinfection utilizing the antibacterial properties of silver nanoparticles offer a solution to perennial issues regarding water contamination [26]. Silver nanoparticles synthesized using *Acalypha indica* leaf effectively inhibit water-borne microorganisms [27]. The growth of harmful pathogenic fish bacteria and mosquito larvae are effectively controlled by silver nanoparticles that have herbal origin [28]. Antimicrobial properties shown by green metal nanoparticles can be used to control the disease mastitis [29]. An ointment prepared using the microwave synthesized and *Naringi crenulata* leaf extract reduced silver nanoparticles showed good wound healing capacity in Wistar albino rats [30]. Silver nanoparticles are used as coating in medical devices and textile fabrics [31]. The cefaclor reduced gold nanoparticles coated on poly(ethyleneimine) modified glass surfaces were used as antimicrobial coatings [32].

Drug delivery protocols

Revolutionary achievements of nanotechnology include the

delivery of drugs that are partially soluble in water, the cell or tissue targeted delivery of the drugs, delivery of macromolecular drugs, combined delivery of two or more drug molecules, imaging of sites of drug delivery, and monitoring the *in-vivo* action of the drugs etc [33]. Cancer treatment involves the cell targeting systems, drug-delivery vehicles, selective labelling of the cancerous cells and proteins, treatment of the affected cells by hyperthermal sensing, and the targeted delivery of the drugs to the treatment area. Fluorescent labelling by gold nanoparticles is the key step in the imaging process [34]. Nanoparticles served as biomarkers in medical sciences and the silver nanoparticles developed from aqueous algal biomass extract of *Dunaliella salina* proved its anticancer effect comparable to the drug cisplatin [35]. Gold and silver nanoparticles are used for the targeting, encapsulation, carrying and controlled release of drugs [36]. Citrate-reduced silver nanoparticles functionalized with thiol-terminated DNA oligonucleotides acted as photoactivated drug delivery vectors [37]. Normally the drug payloads are biopolymers or small drug molecules itself. Timely release of the drugs are inevitable in the targeted therapy and this is achieved by internal or external stimuli. Gold nanoparticles are functioned as a scaffold for the delivery of biomolecules like proteins, peptides and nucleic acids. They become good candidates for gene delivery providing high surface-to-volume ratio and thus creating high payload/carrier ratio [38]. Polydispersed and poly-shaped (spherical, triangular and hexagonal) gold nanoparticles from *Bauhinia variegata* leaf broth has been used in the delivery of drugs and in the sensing of molecules. Synthesis and stability were attributed to carbohydrates and saponins fractions of the plant *Bauhinia variegata* [39].

Conclusion

The cellular and gene toxicity of noble metal nanoparticles warrants further *in-vivo* studies. The metal type, morphology, size,

and the concentration of the nanoparticles are to be concerned in toxicity studies. The human and environmental toxicity parameters are to be taken in to account while providing the silver and gold nanoparticles as health remedies.

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Disclosure of interest

The authors have no conflict of interest regarding this paper.

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ആത്മീയതയുടെ ആഘോഷം ബനീഞ്ഞാക്കവിതകളിൽ

ഡോ. ജോഷി വർഗീസ്

ദസ്തയെപ്പോലെയല്ല വിശ്വാസഹിതുകാരന്മാർ ജീവിതത്തിലൂടെയും കൃതികളിലൂടെയും ഈശ്വരനോട് ചോദ്യങ്ങൾ ചോദിക്കുകയും ഉത്തരങ്ങൾ കണ്ടെത്താൻ അസ്വസ്ഥരായി അക്ഷീണപരിശ്രമം നടത്തുകയും ചെയ്തവരാണ്. ചലിയിൽ ജീവന്റെയും കസർത്സാക്കിസിയുടെയും സാഹിത്യ രചനകളും നീതിഷേയുടെ ഫിലോസഫിയും നമുക്കറിയാം. ഇവരിൽ നിന്നെല്ലാം എത്രയോ വ്യത്യസ്തമായിട്ടാണ് - എത്രയോ ലളിതമായിട്ടാണ് - ബനീഞ്ഞ ജീവിതത്തെയും മരണാനന്തരജീവിതത്തെയും കണ്ടത് എന്നത് ശ്രദ്ധേയമാണ്. ജീവിതത്തിന്റെ മാതമാറ്റിക്സ് ലളിതമല്ലെന്നും മനുഷ്യ ജീവിതം നേർവരയിൽ സഞ്ചരിക്കുന്ന ഒന്നല്ലെന്നും ജീവിതം നൽകുന്ന അഗ്നിപരീക്ഷകളിലെ ചോദ്യങ്ങളുടെ ഉത്തരങ്ങൾ എളുപ്പത്തിൽ കണ്ടെത്താനാവില്ലെന്നും നമ്മുടെ കവയിത്രിക്ക് അറിയാമായിരുന്നു. പക്ഷേ ഈ അറിവ് ബനീഞ്ഞാമയെ ഭയത്തിലേക്കും ആകുലതയിലേക്കും ഉതകേണ്ടതില്ലെന്നും തള്ളിവിട്ടില്ല. ആത്മീയ ദർശനമാണ് ബനീഞ്ഞയിൽ നിറഞ്ഞു നിന്നിരുന്നത് എന്നതാണ് അടിസ്ഥാന കാരണം.

മലയാളത്തിന്റെ മിസ്റ്റിക് കവി സിസ്റ്റർ മേരീ ബനീഞ്ഞയുടെ ഭൂരിഭാഗം കവിതകളിലും ആത്മീയതയുടെ ആഘോഷമാണ് നമുക്ക് കണ്ടെത്താൻ കഴിയുന്നത്. തന്റെ ജീവിതത്തിന്റെ ലക്ഷ്യത്തെ പറ്റി വാഗ്ദാനം ചെയ്ത ആത്മകഥയുടെ ആമുഖത്തിൽ ബനീഞ്ഞാമ്മ പറയുന്നു.

“മർത്യനെ സൃഷ്ടിച്ചത്രിശ്വരനാണെങ്കിൽ
ഈശ്വരനോടൊരു ചോദ്യം”

എന്നൊരു കവിതാ ശകലം ഞാൻ കേട്ടിട്ടുണ്ട്. എന്ത് ചോദിക്കാനാണ്?

“എന്തിനീക്കണ്ണുനീർ താഴ്വര ഞങ്ങൾക്കു നീന്തുവാൻ കല്പിച്ചു തന്നു?”

എന്നുവേണമെങ്കിൽ ചോദിക്കാം. ചോദിക്കാതെ തന്നെ അതിനുത്തരം എനിക്കറിയാമെങ്കിൽ എന്തിനു ചോദിക്കുന്നു? ആ പതാപരണോട് ഒരു ചോദ്യവും എനിക്ക് ചോദിക്കുവാനില്ല. ഈ കണ്ണുനീർതാഴ്വര നീന്തി അവിടുത്തെ കല്പന നിറവേറ്റി മറുകര പറ്റിയിട്ടു സമ്മാനം വാങ്ങിക്കുക തന്നെ- നിത്യസമ്മാനം!

“ധനം സുഖം യശസ്സുമാലിജാത്യവും സ്ഥിതിരാം ജനങ്ങളും സ്വജന്മദേശമച്ഛന്നമമാരെയും

മനസ്സു ബുദ്ധിയോർമ്മശക്തിയിന്ദ്രിയങ്ങൾ ദേഹവും തൂണും കണക്കുയാഗവഹിതനിലിട്ടു ധീരകളോ”യവതാണ് സന്യാസിനികളെന്ന് സഭാവസ്ത്രം സ്വീകരിച്ച് സന്ദർഭത്തിൽ സിസ്റ്റർ ബനീഞ്ഞ എഴുതിയ ‘സ്വർഗീയ സ്വയംവര’ത്തിൽ വ്യക്തമാക്കുന്നുണ്ട്.

‘മണവാളന്റെ മണിവീണ് എന്ന കവിതയിൽ താൻ ക്രിസ്തുവാകുന്ന മണവാളന്റെ മണിവീണയായി മാറുന്ന മനോഹര ചിത്രം കവയിത്രി അവതരിപ്പിക്കുന്നുണ്ട്.

“അകതളിൽ മമ ‘രാഗ്’ പൂർണ്ണമെന്നാ-
ലരിയുകയില്ലതു ബാഹ്യഭൃഷ്ടിയാലേ
ഉടയവന്നുടയാവിരൽ തൊടുമ്പോ-
ളുടനുമ്പ്പനും ബത സുപ്തരാഗമെല്ലാം.
വീരലുകളവിടുന്നു മാറ്റിയെങ്കിൽ
വെറുമൊരു ചേതനയറ്റ വസ്തുവീ ഞാൻ
ഉടനടിയവിടുന്നു മീട്ടിയാലോ
പടുതയൊടുന്നതരാഗമാലപിക്കും.”

“ഞാനെന്റെ നാഥന്റെ സ്നേഹസ്വരൂപത്തെ
മാനസതാരിൽ നിനച്ചിടുമ്പോൾ
ആനന്ദപൂർണ്ണയായെന്റെ വിപഞ്ചിക
താനേ സംഗീതങ്ങളാലപിക്കും.”

ആത്മീയത ആഘോഷിക്കുന്ന കവയിത്രിയെ ‘എന്റെ വിപ

ഞ്ചിക’യിൽ വ്യക്തമായി കാണാം. ഈ രീതിയിൽ ആത്മീയത വാഴ്ത്തിപ്പാടുന്ന വാനമ്പാടിയാണി ബനീഞ്ഞ മാറുന്ന നിരവധി കവിതകളുണ്ട്.

എന്തുകൊണ്ട് താൻ ആത്മീയ ജീവിതം തെരഞ്ഞെടുത്തുവെന്നതിന് ‘ലോകമേയാത്ര’യിൽ വ്യക്തമായ മറുപടി കവയിത്രി നൽകുന്നുണ്ട്.

“എനിക്കു നീ സുഹൃത്തുതന്നെ,യെങ്കിലും വോനിലി
ല്ലനശരംഗുണങ്ങളൊന്നുമെന്നറിഞ്ഞിടുന്നു ഞാൻ”
“നശിച്ചിടാത്ത നേട്ടമൊന്നെനിക്കു നൽകിടുന്നതി-
ന്നശക്തനായ നിന്നെ ഞാൻ ജേച്ചിടുന്നതെന്തിന്?”

എന്നാണ് കവയിത്രിയുടെ ചോദ്യം

മരണശേഷമുള്ള നിത്യജീവിതത്തെപ്പറ്റി-സ്വർഗ്ഗത്തെപ്പറ്റി-ഓർമ്മിപ്പിക്കുന്ന ബനീഞ്ഞാമ്മ ഈ ലോകത്ത് ആത്മീയമൂല്യങ്ങൾക്ക് പ്രാധാന്യം നൽകി ജീവിക്കേണ്ടതിനെപ്പറ്റി ‘ലോകമേയാത്ര’യിൽ അനുവാചകരെ ഉദ്ബോധിപ്പിക്കുന്നു.

“ഇഹത്തിലെ ധനം സുഖം യശസ്സുമാലിജാത്യവും
വഹിച്ചുകൊണ്ടു പോകയില്ല മർത്യനന്ത്യയാത്രയിൽ
അഹന്തകൊണ്ടെഴുക്കു പെട്ടിടാത്ത പൂണ്ണമൊന്നുതാൻ
മഹത്തരം പ്രയോജനം പരത്തിലും വരുത്തിടും”

ഈ ലോകജീവിതത്തിനുശേഷം

“ദിനാന്ത സൂര്യരശ്മി തട്ടിടാത്ത നാട്ടിലൊന്നിൽ നാ-
മനാകുലം സുഖിക്കുമെന്നു കണ്ടിടാം പരസ്പരം”

തന്റെ മണവാളൻ നൽകുന്ന ഈ നിത്യ സമ്മാനത്തെപ്പറ്റിയുള്ള ഉറച്ച ബോധ്യവും വിശ്വാസവുമാണ് കവയിത്രിയെ ആത്മീയത ആഘോഷമാക്കുവാൻ പ്രേരിപ്പിക്കുന്നത്. ആത്മീയതയുടെ ഉന്നത ശൃംഗത്തിൽ എത്തുന്ന ഒരാൾക്കേ ഇത്ര ദൃഢവിശ്വാസത്തോടെ പരലോകജീവിതത്തെപ്പറ്റി പറയാനും പാടാനും കഴിയൂ.

കുരിശിനോട് എന്ന കവിതയിൽ ആവേശത്തോടെ കുരിശിനെ-സഹനത്തെ-സ്വാഗതം ചെയ്യുന്ന കവയിത്രിയെ കാണാം.

“കുരിശേ, കുരിശേ, അടുത്തുവാ നീ
വിരവിൽ സ്വാഗതമോതീടുന്നിതാ ഞാൻ
ഒരു നീരസമില്ലെന്നിരിക്കു നിന്നിൽ
പെരുകും പ്രീതി വളർന്നിടുന്നു നിത്യം”⁹

ആത്മീയ ജീവിതം ആഘോഷിക്കുന്നവർക്കുമാത്രമേ ഇത്ര സ്നേഹത്തോടെയും താല്പര്യത്തോടെയും കുരിശിനെ സ്വാഗതം ചെയ്യുവാൻ കഴിയൂ. കുരിശിനെ സ്വാഗതം ചെയ്യുകയെന്നാൽ സഹനങ്ങളെ അറിഞ്ഞു സ്വീകരിക്കുക എന്നാണ് നാം മനസ്സിലാക്കേണ്ടത്. സഹനങ്ങളെ സന്തോഷത്തോടെ അറിഞ്ഞു സ്വീകരിക്കുക എന്നത് ആത്മീയ വ്യക്തിത്വങ്ങൾക്ക് മാത്രം സാധിക്കുന്നകാര്യമാണ്.

“വരണം വരണം മടിച്ചിടേണ്ടൻ
മരണം നിൻ മടിയിൽക്കിടന്നുവേണം” എന്നാണ് കുരിശിനോടു പറയുന്നത്.

ആത്മീയതയുടെ പ്രകാശം സൗന്ദര്യം നൽകുന്ന കവിതയാണ് ആരാധനയിലെ അദ്ധ്യാത്മിക ചിന്ത. ആരാധനയിൽ കണ്ട “തരുഗുല്മലതാദിയൊക്കെയെൻ

ഗുരുഭൂതാദികളെന്ന് തോന്നി മേ” എന്നു പറയുന്നതിൽ പ്രപഞ്ചത്തെ മുഴുവൻ ഉൾക്കൊള്ളുന്ന ആത്മീയതയുണ്ട്.

ആരാധനയിൽ ചുറ്റും നോക്കിയപ്പോൾ ‘തരുഗുല്മലതാദി’കളൊക്കെ തന്റെ ഗുരുക്കൻമാരാണെന്ന് കവയിത്രിക്ക് തോന്നി. കാരണം അ വയൊക്കെ അറിവ് പകർന്ന് തരുന്നു. ജീവിതത്തെപ്പറ്റി ഉൾക്കാഴ്ച നൽകുന്നു. പ്രകൃതിയിൽ തരുഗുല്മലതാദി കളിൽ ഗുരു ചൈതന്യം കണ്ടെത്താൻ ആത്മീയതയാണ് സഹായിക്കുന്നത്. ആത്മീയതയില്ലാത്തവർ നിസ്സാരമെന്ന് പറഞ്ഞ് തള്ളിക്കളയുകയും അവഗണിക്കുകയും ചെയ്യുന്ന പ്രകൃതിയിലെ ചരാചരങ്ങളെ നിസ്വാർത്ഥമായി സ്നേഹിക്കാനും വിലമതിക്കാനുമുള്ള മനോഭാവം ആത്മീയതയിൽ നിന്ന് ഉടലെടുക്കുന്നതാണ്. ഈ കവിതയിൽ ആദ്ധ്യാത്മിക ചിന്ത പൂണ്ടു പ്രാർത്ഥിച്ചു നിൽക്കുന്ന വ്യക്ഷത്തെ ബനീഞ്ഞാമ്മ കാണിച്ചു തരുന്നുണ്ട്.

“തലവെട്ടി മറിച്ചിടുമ്പോഴും
നിലതെറ്റാതെയുറച്ചു നിന്നിടും
സ്ഥിരചിത്തതയോർക്കിലേവനും
ചരണം താണു നമിക്കുമപ്പെറ്റേ.”¹⁰

“അഴലോടുഴലുന്ന പാമ്പനേ
നിഴലിൽ തന്നരികത്തണച്ചീവൻ
അഴകും ഗുണവും തികഞ്ഞ നൽ
പ്പഴവും പൂക്കളുമേകിടും മുദാ
ഒരു ശത്രുവിനും വിരോധമാ-
യൊരു കൃത്യത്തിനൊരുങ്ങിടാമരം,
ചുവടേകനറുത്തിടുമ്പൊഴും
തണലേകുന്നവനീമഹാശയൻ”¹¹

വ്യക്ഷം നൽകുന്ന ആത്മീയതയുടെ പാഠങ്ങൾ ഹൃദയ സ്പർശിയായി അവതരിപ്പിക്കാൻ കവയിത്രിക്ക് കഴിഞ്ഞു.

‘സായാഹ്നത്തിലെ ഏകാന്തയാത്ര’യിൽ ലോകജീവിതത്തിൽ നാം ഏറ്റവും വിലമതിക്കുന്നവയ്ക്ക് മരണം നമ്മെ കൂട്ടിക്കൊണ്ടുപോകുമ്പോൾ സംഭവിക്കുന്നത് എന്താണെന്ന് ചിന്തിക്കാൻ കവയിത്രി ഓർമ്മിപ്പിക്കുന്നു.

“കഷ്ടപ്പെട്ടിഹ ശേഖരിച്ച ധനമോ
തൻധർമ്മദാരങ്ങളോ
ഇഷ്ടപ്പെട്ടൊരുമക്കളോ, വേനമോ
ബന്ധുക്കളോ, കുട്ടരോ
കഷ്ടം! തൻ സവിധത്തിലില്ല വളരെ
സ്നേഹിച്ച ദേഹത്തെയി-
നഷ്ടിക്കായ് വിഭജിച്ചിടുന്നു നരിയും
നായും മഹാ കഷ്ടമേ!”¹²

നമ്മുടെ ക്ഷണികജീവിതത്തെപ്പറ്റി ഓർമ്മിപ്പിച്ചുകൊണ്ട് ആത്മീയ ജീവിതത്തിന് പ്രഥമ സ്ഥാനം നൽകണമെന്ന് കവയിത്രി ഉദ്ബോധിപ്പിക്കുന്നു. ‘യാഥാർത്ഥ ലോകം’ എന്ന കവിതയിൽ ഈ ലോകത്തിൽ നാം അനുഭവിക്കുന്ന അസ്വസ്ഥതകൾക്ക് അടിസ്ഥാന

കാരണമായി കവയിത്രി ചുണ്ടിക്കാണിക്കുന്നത് ലോകത്തിലുള്ള വയോട് നമുക്കുള്ള ആശയമായാണ്.

“ചേതസ്സാമോജ്യ സിംഹാസനമതിലമരും രാജനാമഗ്ദ്ധേ നാം

വീതാശങ്കം പുറത്താക്കിടണമുടനെ വി-
ന്നെത്തിടും ഭവ്യമെല്ലാം.

പിന്നീടെല്ലാം ശുഭം; നാമൊരു വകയഹിതം
കൊണ്ടു മസ്വസ്ഥരാകാം.

മന്നിൽക്കൊണ്ണുന്നതെല്ലാം സുഖതരവഴിയായ്-
ത്തന്നെ തോന്നീടുമപ്പോൾ.

വർണ്ണിക്കാൻ സാധ്യമല്ലാത്തൊരു പരമപദ-
പ്രാപ്തിയും ലഭ്യമാകും.”¹³

നമ്മുടെ മനസ്സിലുയരേണ്ട ചില ചോദ്യങ്ങൾ - ധ്യാന വിഷയങ്ങൾ - കവയിത്രി ഈ കവിതയിൽ അനുവാചകരുടെ ആത്മപരിശോധനയ്ക്കും ആത്മ വിചാരണയ്ക്കുമായി സമർപ്പിക്കുന്നുണ്ട്.

“എന്താണീ ലോകം, മാരാണൊരുവനിവിടെയീ
ദേഹികൾക്കുറ്റമിത്രം?

സന്താപാലോഭാധി തന്നിൽ തുഴയുമൊരുവനി-
ങ്ങാരാരാലാലാംബമോർത്താൽ?

സന്തോഷത്തിനു പാർത്താലവിടെയൊരഭയ-
സ്ഥാനമിന്നീ ജഗത്തിൽ?”¹⁴

ഈ ചോദ്യങ്ങൾക്ക് വളരെ വ്യക്തമായ ഉത്തരം ബന്ദിത്താമ കണ്ടെത്തിയിട്ടുണ്ട്. ആത്മീയ മൂല്യങ്ങൾക്ക് പ്രാധാന്യം നൽകി ജീവിച്ച് ദൈവസന്നിധിയിലെത്തി നിത്യസമ്മാനത്തിന് അർഹയാവുകയാണ് ജീവിതലക്ഷ്യമെന്ന് നിരവധി കവിതകളിലൂടെ കവയിത്രി നമുക്ക് പറഞ്ഞുതന്നിട്ടുണ്ട്.

‘എന്നും ഞാൻ സ്നേഹിക്കും’ എന്ന കവിതയിൽ മറ്റുള്ളവർ പരമപ്രധാനമായി കരുതുന്ന ലോകവസ്തുക്കളെ താൻ എത്ര നി

സ്സാരമായിട്ടാണ് തള്ളിക്കളയുന്നതെന്ന് മേരി ബനീത്ത വ്യക്തമാക്കുന്നുണ്ട്.

“കുന്നുപോൽ പൊന്നും പണവും വിശേഷമായ്
മിന്നും മനോഹര രത്നങ്ങളും

വന്നെന്റെ കാലിണകുപ്പി നമിച്ചാലു
മെൻ നാഥനേമാത്രം ഞാൻ സ്നേഹിക്കും.

എന്നല്ല മുന്നുലോകത്തിനും റാണിയായ്-
യെന്നെക്കിരീടമണിയിച്ചാലും

സന്ദേഹം കൂടാതെ ഞാനതു സംതൃപ്തി
ച്ചെൻ നാഥപാദതാർ സേവിച്ചീടും.”¹⁵

അമൃതധാരയിലെ കവിതകളുടെ അടിസ്ഥാന പ്രമേയം ക്രിസ്തുവിന്റെ മലയിലെ പ്രസംഗത്തിലെ സുവിശേഷ ഭാഗങ്ങളാണ്.

ആത്മീയാനന്ദത്തെ വാഴ്ത്തിപ്പാടിയ വാനന്ദാടിയാൽക്കുന്നു മേരി ബനീത്ത.

ഇതല്ലേ കാരണമെന്ത്? എന്ന കവിതയിൽ പ്രപഞ്ചത്തിലുള്ള സർവ്വ ചരാചരങ്ങളിലും ദൈവത്തിന്റെ മഹിമാ വിശേഷം നിറഞ്ഞു നിൽക്കുന്നത് കവയിത്രി നമുക്ക് കാണിച്ചു തരുന്നുണ്ട്.

“ദൈവത്തിൻ മഹിമാവിശേഷമതുലം

പ്രത്യക്ഷമാമേതിലും

ആ വൻകാട്ടിനകത്തിരുണ്ട ഗൃഹയിൽ

പോകേണ്ട; രുദ്രാക്ഷവും

കാവിപ്പട്ടമണിഞ്ഞിടേണ്ട, പരനെ-

ധ്യാനിപ്പതിന്നാരുമേ”¹⁶

ആത്മീയതയുടെ നിറവിലാണ് പ്രപഞ്ചത്തിലുള്ള സർവ്വ ചരാചരങ്ങളിലും ദൈവത്തിന്റെ മഹിമാവിശേഷം കാണാൻ കവയിത്രിക്ക് കഴിയുന്നത്.

‘കാലേ, നീയൊരു വിഷമക്കാരൻ’ എന്ന കവിതയിൽ സമ്പത്തിനു നാം കൊടുക്കുന്ന അമിത പ്രാധാന്യം സന്തോഷവും സമാധാനവും നഷ്ടപ്പെടുത്തുന്നതിനെപ്പറ്റി കവയിത്രി പറയുന്നുണ്ട്.

“കാശേ, നീയൊരു വിഷമക്കാരുൻ
‘കശപിശ’ പറയും പ്രകൃതക്കാരുൻ
കാശിപ്പൊത്തൊലെയും വിഷമം
കാശുണ്ടായാലതിലും വിഷമം
കാശും കാശും കൂടിയുരഞ്ഞാൽ
‘കശപിശ’ പിന്നെ പറയാനില്ല.”¹⁷

പ്രപഞ്ചകാവ്യം എന്ന കവിതയിൽ പ്രപഞ്ചത്തിന്റെ സൃഷ്ടി കർത്താവിന് മുന്നിൽ വിനീതയായി ആദരവോടെ പ്രണമിക്കുന്ന കവയിത്രിയെ കാണാം.

ജീവിത ക്ലേശഭാരം കൊണ്ടു വലയുന്നവരെആശ്വസിപ്പിക്കുവാനായി എഴുതിയ “സാന്ത്വനം” എന്ന കവിതയിൽ സഹോദരങ്ങളോട് കവയിത്രിക്ക് പറയാനെന്നുമത്രം

“സോദര ! ജീവിതക്ലേശഭാരം കൊണ്ടു
മോദനീവാസം വെറുക്കുന്ന സോദര !
സാഹസം വല്ലതും കാട്ടെല്ലോ, മർത്യനീ
ദോബന്ധം നിത്യമല്ലെന്നുറയ്ക്കുന്നീ”¹⁸
“സ്വന്തവേഷത്തിനു യോജിച്ച നാട്യങ്ങളെന്തും നിത്യമേഷനാകാതെ കാണിച്ചു
പിന്തിരിഞ്ഞാലും! സഭാനാഥനുന്നതൻ
സന്തുഷ്ടനായ് നിത്യസമ്മാനമേകിടും”¹⁹
‘വേദാന്തചിന്ത’യെന്ന കവിതയിലും ഈ ആത്മീയദർശനം നിറഞ്ഞുനിൽക്കുന്നു.

“ക്ലേശങ്ങൾ പിമ്പതുപൻ മനുജരിലധികം
പ്രീതനായ് ചിന്തിടുനൊ-
രാശിസ്സാണജ്ഞരാം നാമതിനെയഹിതമാം
ശാപമെന്നെണ്ണിടൊല്ലോ.
ലോകം കൂസാതെമുള്ളിൽ വിഷമുനകൾ ചവി-
ട്ടിക്കടന്നോടിയത്രേ
ശാശ്വതത്വം സ്വർഗ്ഗഭാഗ്യം സുകൃതികളൊലിലാം
സ്വന്തമാക്കുന്നുമോദാൽ”²⁰

ജീവിതത്തിൽ സംഭവിക്കുന്നതെല്ലാം ദൈവം അറിഞ്ഞുതരുന്നതാണെന്നും ആ അനുഭവങ്ങളെയും സഹനങ്ങളെയും ദുരന്തങ്ങളെയും ചോദ്യം ചെയ്യാതെ വിധേയത്വ മനോഭാവത്തോടെ സ്വീകരിക്കുകയാണ് മനുഷ്യന്റെ കടമയെന്നുള്ള ബോധ്യമാണ് ബനീഞ്ഞാമ്മ കവിതകളിലൂടെ പകർന്നു നൽകുന്നത്. ‘വാന്യമാടി’യുടെ ആമുഖത്തിൽ ബനീഞ്ഞാമ്മയുടെ വാക്കുകൾ ശ്രദ്ധിക്കുക.

“കവിതാകാമിനിയും ഞാനും പരസ്പരം ആശ്ലേഷിച്ച് കല്ലും മുളളും നിറഞ്ഞോരിടവഴികളിലൂടെ സന്തുഷ്ടരായി നടന്നിരുന്നു. യാതനകളിലും വേദനകളിലും ഞങ്ങൾ സന്തുഷ്ടരായിരുന്നു.”

“എന്തിനായ് ജനിച്ചു ഞാൻ? സഹിക്കാനായിത്തന്നെ എന്തിനായ് സഹിക്കണം? നിത്യസൗഭാഗ്യത്തിനായ് എന്നു ഞങ്ങൾ ഒരുമിച്ചു പാടിയിരുന്നു.”²¹

ബനീഞ്ഞ തന്റെ കവിതകളിൽ നിരന്തരം ആത്മീയത ആഘോഷിക്കുകയാണ് ചെയ്തത്. ആ ആഘോഷ പാട്ടുകളിൽ കവയിത്രി എന്തുമത്രം ആത്മസമർപ്പണം നടത്തിയിരുന്നുവെന്നതിന് ആ കവിതകൾ സാക്ഷ്യം പറയും. ‘പറുദീസായിലെ പൈങ്കിളി’യിൽ ബനീഞ്ഞാമ്മ പാടുന്നു.

“പാടിടും പാട്ടൊന്നുഞാൻ ചുണ്ടുകൾ വിടർത്താതെ
കൂട്ടുമാനദത്തോടെന്നന്തരംഗത്തിൽ തന്നെ
ആരു ഞാനേശുവിന്റെയോമന ചെറുകിളി
പാരഡൈസ്സിലാണെന്റെ വാസവും സഞ്ചാരവും
വൃക്ഷശാഖയിലെങ്ങുമല്ല ഞാനിരിപ്പിൽ
രക്ഷകനേശുവിന്റെയുള്ളം കൈകളിലത്രേ.”²²

‘കാലിത്തൊഴുത്തിലെ ദിവ്യബലൻ’ എന്ന കവിതയിൽ ബനീഞ്ഞാമ്മ തന്റെ അനുഭവ പ്രാർത്ഥന അനുവാചകർക്ക് മുന്നിലവതരിപ്പിക്കുന്നുണ്ട്.

“കൈവലുദായകാ! കാതണപൂരൂഷാ!
ദൈവകുമാരാ! ഞാനെന്റെ ഹൃത്തിൽ
തന്നടുമങ്ങേയ്ക്ക് ഭദ്രമാം പാർപ്പിടം
വന്നാലും! പാവന സ്നേഹമൂർത്തേ.”²³

“ഇച്ചെറു വേനം തൃക്കരവലയം
സ്വർഗ്ഗമെന്നിരിക്കീയനുഭൂതികൾ നില
നിൽക്കാൻ പ്രാർത്ഥനയഖിലാസ്യത്തി
ന്നുടയവനേ, കൃപ ചെയ്തീടണമേ.”²⁴

എന്ന പ്രാർത്ഥന മാത്രമേ കവയിത്രിയിൽ നിറയുന്നുള്ളൂ.
‘ഇളകാത്ത ഭവനം’ എന്ന കവിതയിലാണ് ആത്മീയതയുടെ നിറ
വിൽ ഈ ഗാനം പാടുന്നത്

വരുന്നു വരുന്നു ഞാൻ എന്ന കവിതയിൽ നമ്മുടെ വാന
ന്മാടി പാടുന്നു.

“ഈ മഹാസ്വമുദ്രത്തെത്താണ്ടി ഞാനൊരിക്കലേൻ
പ്രേമനാഥനെസ്സമീപിച്ചിടും നിസ്സംശയം”²⁵

‘വേദാന്തചിന്ത’യിൽ നിത്യ സമ്മാനത്തിനായുള്ള തന്റെ
കാത്തിരിപ്പിനെപ്പറ്റി കവയിത്രി പാടുന്നുണ്ട്.

“എല്ലാ ക്ലേശങ്ങളും തീർന്നൊരുസുഖിനമുദി
ച്ചീടുമീദീർഘയാത്ര-

യ്ക്കെല്ലാമപ്പോൾ വിരാമം വരു, മവിടെ നമു
ക്കെത്രയാനന്ദമോർത്താൽ

വല്ലാതപ്പോൾ ലലാടസ്ഥലമതിൽ നിറയും

സേവദബിന്ദുക്കളേ നി

സ്തുല്യസ്നേഹത്തോടെ നല്ലൊരു മൃദുലകരം

മന്ദമന്ദം തുടയ്ക്കും.”²⁶

സ്വർഗ്ഗത്തിൽ തന്റെ കർത്താവാകുന്ന മണവാളൻ തന്നെ
സ്വീകരിച്ച് ആശ്വസിപ്പിക്കുന്ന സുന്ദരദൃശ്യം ബനീഞ്ഞാമ്മയുടെ മ
നസ്സിൽ നിറഞ്ഞു നിന്നിരുന്നു. അതുകൊണ്ട് ആത്മീയതയുടെ ഉ
ദാത്തഭാവങ്ങൾ അനുവാചകർക്ക് പകർന്നുനൽകുന്ന-ആത്മീയത
ആഘോഷിക്കുന്ന-കവിതകൾ എഴുതാൻ സിസ്റ്റർ മേരി ബനീഞ്ഞ
യ്ക്ക് കഴിഞ്ഞു. ബനീഞ്ഞാക്കവിതകളിൽ ആത്മീയതയുടെ പ്രകാ
ശമുണ്ട്. ആത്മസമർപ്പണത്തിന്റെ സുഗന്ധമുണ്ട്. ആത്മീയ ദർശന
ത്തിന്റെ ഹൃദയമായ ആവിഷ്കാരമുണ്ട്. ലൗകിക ജീവിതത്തിന്റെ
വർണ്ണപ്പകിട്ടുകളെ നിസ്സാരമായി തള്ളിക്കളയാനുള്ള ധീരതയുണ്ട്.

സിസ്റ്റർ മേരി ബനീഞ്ഞ ആത്മീയതയെ ആഘോഷിച്ച കവയിത്രി
യായിരുന്നുവെന്ന് അവരുടെ ജീവിതവും സാഹിത്യകൃതികളും വ്യ
ക്തമായി തെളിയിക്കുന്നുണ്ട്.

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4. ബനീഞ്ഞാക്കവിതകൾ പേജ് 950
5. ബനീഞ്ഞാക്കവിതകൾ പേജ് 81
6. ബനീഞ്ഞാക്കവിതകൾ പേജ് 82
7. ബനീഞ്ഞാക്കവിതകൾ പേജ് 82
8. ബനീഞ്ഞാക്കവിതകൾ പേജ് 84
9. ബനീഞ്ഞാക്കവിതകൾ പേജ് 86
10. ബനീഞ്ഞാക്കവിതകൾ പേജ് 64
11. ബനീഞ്ഞാക്കവിതകൾ പേജ് 65
12. ബനീഞ്ഞാക്കവിതകൾ പേജ് 19
13. ബനീഞ്ഞാക്കവിതകൾ പേജ് 869
14. ബനീഞ്ഞാക്കവിതകൾ പേജ് 867
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16. ബനീഞ്ഞാക്കവിതകൾ പേജ് 11
17. ബനീഞ്ഞാക്കവിതകൾ പേജ് 269
18. ബനീഞ്ഞാക്കവിതകൾ പേജ് 881
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21. ബനീഞ്ഞാക്കവിതകൾ പേജ് 1116
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Micro-finance and Micro credit for sustainable Business

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Need for managing financial risks has given birth to a number of micro credits, micro insurance products and many other financial services that are micro in nature. Over the years, micro finance as a financial service innovation is fast emerging as an important method of bettering the lot of the poor and the downtrodden. Micro finance is finance provided to benefit the low income women and men. It can be defined as provision of thrift, credit and other financial services and products of very small amount to the poor in rural, semi-urban or urban areas for enabling them to raise their income levels and improve living standards.

Micro credit is based on the premise that the poor have skills which remain unutilized or underutilized. In its latest report on the state of the micro finance industry, the Microcredit Summit Campaign says: if we want to provide financial services in a way that helps people to move out of poverty, then we need to provide things that cannot be stolen. In the last decade microfinance has penetrated major part of rural and sub urban India empowering particularly women. These women have taken up many professions including self employed sectors like cottage industries, tailoring, and handicrafts among other. This in turn has assisted in the overall development of the rural economy. This paper attempts to make a study on the contribution of micro finance and micro credit in sustainable business.

Key words: Micro Finance, Micro credit, Loss and Sustainability

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Introduction

Micro finance is fast emerging as an important method of bettering the lot of the poor and the women. The subsidy driven schemes were given importance to make the poor self-reliant, in particular, and eradicate poverty in general. There has been more emphasis on empowering the powerless rural women. Micro finance programme offers the surest ways by which to make best use of the scarce development funds to achieve the objective of poverty alleviation. Rather it aims at improving the lot of the women by effectively organizing women to work for women. For this, their active and committed participation is needed.

The various models of micro financial services attempt to explain the role of micro finance, in the realm of development and growth of poor and the rural people. The two apex level financial institutions which are promoting, supporting and financing such development programmes in the country are NABARD and SIDBI. Besides these two, there are many other Micro Finance Institutions (MFIs). Microfinance is seen as an important tool for poverty alleviation and over the years, microfinance institutions (MFIs) have placed themselves as fulfilling this developmental goal. The basic philosophy of the 'linkage model' promoted by NABARD is to establish synergy between the banks, who have the financial strength and the NGOs, who have the ability to mobilize the poor and build up their capacity to avail loans from the banks. This is expected to facilitate the poor to graduate to a level, from where they can access larger amounts of loan directly from the banks without the intervention of NGOs. In addition to providing refinance to banks, NABARD has been supporting various partner agencies for capacity building through grants and Revolving Fund assistance (RFA) for micro credit innovations.

Objectives of the study

- To study how micro finance and micro credit as tools help to sustain business.
- To create awareness about the provisions of credit and funds available in the Indian Financial System.

Literature review

Micro finance is expected to play a significant role in poverty alleviation and development. Micro finance is an attempt to break this deadlock, by providing the poor with the financial means to engage in new forms of economic activity, and so improve their lives. Equitable gains from development on a sustainable basis and ensuring viability of financial services are key elements in a strategy of poverty reduction by means of credit support to the poor as micro finance is seen to be an approach addressing these concerns effectively, it has assumed significance in all the developing countries as an effective tool in fighting poverty. In India, as the formal banking system already has a vast branch network in rural areas, it was perhaps wise to find ways and means to improve the access of rural poor to the existing banking network. The micro finance scene in India is dominated by Self Help Groups (SHGs)-Bank linkage programme for over a decade now. The group members use collective wisdom and peer pressure to ensure proper end-use of credit and timely repayment thereof. Further, the SHGs have also undertaken effective social mobilization functions contributing to an overall empowerment process. The banks have externalized what would otherwise have been high transaction costs for mobilizing savings of the poor, appraisal and sanction of loans and improved loan recovery through the financial intermediate role played by SHGs.

The need for micro financial services

The need for micro financial services arises on account of the following reasons:

1. **Poverty alleviation:** In a country like ours, there is an urgent need to alleviate poverty and one of the means to accomplish this is through the promotion of sustainable livelihood by providing easy and affordable access to credit and other complementary services. Micro finance is considered as a potential instrument for combating poverty in a sustainable manner.
2. **Women empowerment:** Women play major roles as farmers and business people; however, many lack financial capability. Micro financial services are essential for the empowerment and upliftment of women. It serves as a tool, by mobilizing women, organizing them into groups, building their capacity for self-management at the grass roots and enabling them to access wide range of financial services. Thus micro finance helps in bringing out the hidden and untapped potential of the poor and the women.
3. **Harnessing talents:** Micro financial services facilitate enterprise development and provide for employment generation in rural areas. Micro financial services are needed to help harness the talent leadership and entrepreneurial abilities of the poor.
4. **Credit delivery:** Micro financial services are needed to ensure effective credit delivery system. The system seeks to ensure rational allocation of resources in the form of subsidized credit especially in rural areas.

Micro credit

It is definitely not the lack of skills that make the poor people poor but lack of proper distribution of available funds and its management. Micro credit is based on the premise that the poor have skills which remain unutilized or underutilized. Observations and experience show that women are a small credit risk, repaying

their loans and tend more often to benefit the whole family. In another aspect it's also seen as a method giving the women more status in a socio-economic way and changing the current conservative relationship between gender and class when women are able to provide income to the household. There are many reasons why women have become the primary target of micro finance services. Giving women access to micro credit loans therefore generates a multiple effect that increases the impact of micro finance institution's activities.

In common meaning Micro credit is "Loan of very small amount". Micro Credit is provided to those individuals that lack collateral, steady employment and a verifiable credit history and therefore cannot meet even the most minimal qualifications to gain access to traditional credit. This group of individuals includes artisans, tiny and small industries, grocers, vegetable vendors, rickshaw pullers, roadside retailers and the like. Other activities include farming, poultry, cattle rearing, piggery, fishery etc.

Micro finance, especially micro credit, has been an effective tool to fight against social iniquity. Improved access to micro finance can enable the poor to manage their risk better, gradually build their asset base, develop their micro enterprises, enhance their income earning capacity, and enjoy an improved quality of life. It is amazing to know how many people are desperately looking forward to getting money to kick-start their lives. It is also unfortunate to know that larger banks are not yet willing to lend money. As a result the credit demands in India, remains unfulfilled. Microcredit must reach the poor, building their capacity to absorb higher credit, and also ensure greater availability of credit for small enterprises.

Loss and chance of loss

Loss means being without something previously possessed.

Income shocks, or sudden and unexpected decreases in household income, can negatively affect the financial stability and well-being of households that experience them—and they are not uncommon. An essential part of poverty reduction programme should be to help the poor manage their risk, and should complement effort to increase the household income. Crime and domestic violence, illness and injury, crop failure, old age, natural disaster, fluctuations in food price and demand for labour constitute such risks. People in the rural area respond to their risk exposure through various means like diversification of assets/sources of income and various types of self-insurance and informal insurance. Whenever and wherever these pre-emptive mechanisms prove inadequate, the households cope with the shock by increasing or diversifying labour supply through various means like child labour, selling assets or reducing consumption etc. Shocks will not affect all members of the rural household equally. Women and children are the worst sufferers.

When poor people have access to financial services, they can earn more, build their assets, and cushion themselves against external shocks. Poor households use microfinance to move from everyday survival to planning for the future: they invest in better nutrition, housing, health, and education. Many studies show that poor people are very keen in following the rules, trustable with higher repayment rates than conventional borrowers. Flexibility is important for the poor because it helps them to manage money. Micro credit is based on the premise that the poor have skills which remain unutilized or underutilized.

There are many reasons why women have become the primary target of micro finance services. Giving women access to micro credit loans therefore generates a multiple effect that increases the impact of micro finance institution's activities. Microcredit must

reach the poor, building their capacity to absorb higher credit, and also ensure greater availability of credit for small enterprises. This group of individuals includes artisans, tiny and small industries, grocers, vegetable vendors, rickshaw pullers, roadside retailers and the like. Other activities include farming, poultry, cattle rearing, piggery, fishery etc. It is amazing to know how many people are desperately looking forward to getting money to kick-start their lives. It is also unfortunate to know that larger banks are not yet willing to lend money. As a result the credit demands in India remain unfulfilled. There are some restrictions regarding what the money is used for. Usually micro credits can't be used for the purposes like:

- § Payments of other loans or other debts;
- § Production of tobacco and liquor;
- § Establishing trading points;
- § Forming turnover capital of trade and intermediary business;
- § Organization or purchasing products for gambling;
- § Purchase of property that's not used for business etc.

Microfinance has become an important instrument in reaching credit to the poor and to tiny enterprises. These must reach the poor in far greater numbers and build their capacities to absorb higher amounts of credit. The key to the empowerment of all people is education and the assurance of gainful employment. Our challenge is to ensure that the benefits of economic growth and development translate into productive employment for all, including women."

Many studies show that poor people are trustworthy, with higher repayment rates than conventional borrowers. When poor people have access to financial services, they can earn more, build their assets, and cushion themselves against external shocks. Poor households use microfinance to move from everyday survival to planning for the future: they invest in better nutrition, housing, health,

and education. Most poor people cannot get good financial services that meet their needs because there are not enough strong institutions that provide such services. Strong institutions need to charge enough to cover their costs. Cost recovery is not an end in itself. Rather, it is the only way to reach scale and impact beyond the limited levels that donors can fund.

Conclusion

Micro finance revolution provides abundant stimulus for taking the process of poverty reduction forward. A financially sustainable institution can continue and expand its services over the long term. Achieving sustainability means lowering transaction costs, offering services that are more useful to the clients, and finding new ways to provide banking services to the poor. At the end it should be mentioned that Poor people with no income or means of repayment need other kinds of support before they can make good use of loans. In many cases, other tools will alleviate poverty better—for instance, small grants, employment and training programs, or infrastructure improvements where possible. Such services should be coupled with building savings. It shows that access and efficient provision of microcredit can enable the poor to smooth their consumption, better manage their risks better, gradually build their assets, develop their micro enterprises, enhance their income earning capacity and enjoy an improved quality of life. Microfinance services can also contribute to the improvement of resource allocation, promotion of markets, and adoption of better technology; thus, micro finance helps to promote economic growth and development

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Carbon Trading: Green Signal to Green Earth

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Abstract

The Kyoto Protocol, 1977 made the countries to work out action plans to address the issues on climate change and the reduction of green house gas emissions. Even though it was a great march towards green earth, the issue of striking a balance between the industrial and economic development on one side and green initiative on the other side is a mammoth problem need to be faced by the world. This situation opened a platform for discussion upon the issue among the developed and developing countries.

Carbon trading initiatives in the world turned around mainly upon the carbon-capping and carbon offsetting which opens an opportunity to trade the unused credits as well to green technology for offsetting carbon emissions. Under carbon-cap trading programme, the countries with less emission can trade the credits among the countries with excess limits. In carbon offsetting, environment friendly technologies are developed or imported as well

alternative carbon controlled forms of energy are tapped by the countries to mark their commitment.

Since the inception of the concept in 2005, several initiatives were already undertaken to implement the idea with synergy. To hit target 2020 world around, especially in Europe, the countries need to proceed with high pace. All such initiatives will substantially improve the quality of life of the people. It will be a good source of revenue for developing countries and acts as an impetus for alternative sources of energy which will reduce the green house gas emission. But it will provide the developed countries a supreme position over the developing countries to engage in industrial or development activities without any control results in any remarkable change in the overall carbon crisis.

Even though there is lot of controversy regarding the strategic role played by developed countries over developing countries, green efforts are inevitable to ensure the survival of human beings and development of alternative sources and advanced technology.

Key words: *Carbon trading, carbon-cap, carbon offsetting, unused credits, green technology*

Introduction

United Nations Framework Convention on Climate Change (UNFCCC), 1992 is an international treaty to deal with the greenhouse gases and the efforts to control the issues of climate change. The Kyoto Protocol, 1997 is an international treaty, which is an extension of the UNFCCC treaty that commits the participating countries to reduce greenhouse gases emissions on the grounds of global warming and man-made green house gas emission issues. Kyoto Protocol was introduced in 11 December, 1997 in Kyoto, Japan and was enforced fully in 16 December, 2005. As on June

2013, 192 countries signed this Protocol to support the initiatives to check drastic environment changes. The Protocol initially sets the target of reducing emissions by an average of 5.2 percent below 1990 greenhouse gas levels by the year 2012.

Objectives of the Kyoto Protocol

The main objectives of the Protocol are:

- To stabilize the reconstruction of greenhouse gases in the atmosphere and thereby to address the issues of climate change
- To create awareness on global warming and binds legally its members to fight it
- The commitment to reduce green house gases
- The use of mechanisms such as increasing the absorption of gases
- Making policies to reduce global warming
- Establishment of adaptation fund for minimizing impacts of global warming on people
- Constitution of Enforcement Compliance Committee to monitor and guide the initiatives

The Protocol is based on the *principle of common but differentiated responsibilities*, creating the obligation to reduce current emissions on developed countries on the ground that they are basically responsible for the current levels of greenhouse gases in the atmosphere. The first commitment period of Protocol was started in 2008 and ended in 2012. The second commitment period was started in 2012, known as the Doha Amendment to the protocol, for a period ranging from 2012 to 2020.

Developed countries and carbon emission

It is considered that the largest share of carbon emission

came from the developed countries. The major reason for this is that the industrialization brought immense development in the developed countries along with its side effects of global warming. However, the per capita emission of carbon in developed countries is brought to a lower level through the various measures taken by them like the tax levied on the emission of the green house gases, massive awareness about the global warming, introduction of *Carbon Capture Method* and utilization of alternative energy resources. As per the statistics in 2010, even though India stands in the fourth position in carbon emission, the rates were far behind the leading carbon emission countries like America, China, etc.

Carbon credit trading

Under the Kyoto Protocol, the member countries agreed to control their greenhouse gas emissions below their country-specific target within a pre-defined timeframe. These countries were then given a specific number of *emissions permits*. The volume of this permit is equivalent to their 1990 levels of emissions adjusted to the reduction commitment or undertaking. These permits are measured in units of carbon dioxide, one of the main greenhouse gases. One ton of carbon dioxide equals one permit. The credits are licenses to pollute up to the limits set by the commitment to reach the average reduction of 5.2 percent in total agreed in Kyoto. The countries then allocate the permits to the most polluting countries, for the amount negotiated. Thus, a *carbon credit* is a certificate or a license which represents the right to emit one ton of green house gases which can be traded for money. This credit so acquired can be used in several ways by the countries. They are:

- If one country does not use its entire *emissions permits*, it can either save the remaining permits for the next time period and bank it, or sell them to another country in the market.

- If one country uses up its allowance in the allotted time period, but emits more green house gases, it must buy permits from another country that has not used up its full permits.

- One country can invest in green house gas reduction projects in other countries or regions to earn extra credits that can be sold, banked, or used to make up the deficit later.

But certain countries like USA, India, China, etc., which are responsible for a large proportion of global emissions have avoided mandatory caps, the business in capped countries may perceived themselves to be working at a competitive disadvantage against those in uncapped countries as they are paying for their carbon costs directly or adopted alternative means of reducing carbon emission.

Move to Green planet

The following initiatives may be taken by the member countries, especially India, to effectively manage and benefit out of the carbon credit trading:

Green certification with credit points to industries

The competent body constituted by the appropriate Government may issue Green Certification with credit points to those industries structural wide for their approved green initiatives.

Announcing green initiatives as part of Corporate Social Responsibility

The Government should assign and announce some green initiatives compulsorily taken up by the corporate world, proportionate to the extent of carbon emission, like afforestation, installation of solar panels in the local areas, sponsoring carbon clean initiatives of local bodies, etc.

Facilitate inter-institutional carbon trading within the country

A proper inter-industry arrangement may be developed to support the carbon credit settlements between industries in the country on a competitive basis.

Develop alternatives for carbon emission gases

Green technology may be subsidized by the Government and assign more carbon credit weights to the efforts of the industries to replace carbon emission gases and assistance may be planned for creative R&D.

Effective industrial waste disposal mechanism

All those sources of carbon emission may be scientifically structured to avoid or to minimize the incidents of open emission or radiation. The industrial waste disposal system may be given due weightage in arriving at carbon credits.

Augmenting Carbon Capture Mechanisms in the country

It is the mechanism of capturing waste carbon dioxide and other green house gases from large emission sources, such as fossil fuel power plants, transporting it to a storage site, and disposing it where it will not enter the atmosphere, normally in an underground geological area.

Constitution of a machinery for Carbon Credit Trading

A statutory body may be constituted under the initiative of the Central Government to facilitate, regulate and control the trading in Carbon Credit.

Solid criteria for certification

The Carbon Credit Certificates, Voluntary Emission Reductions (VERs), Certified Emission Reductions (CERs) for green projects that generate carbon credits should be certified by the

competent authority on a solid ground.

International Accounting Standard for Carbon Credit

Internationally accepted accounting standards should be developed to facilitate uniformity in the criteria followed in determining the carbon credits and related calculations.

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The Nostalgic Nomenclature of Eateries: A Cultural Reading of the Names of Street Food Stalls in Kerala

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Abstract

The culture of Kerala is inseparably entwined with the cultural development of hotels and cuisines. From the thatched teashops to the budding street food stalls stand as witnesses to the cultural changes that revolutionize the taste of the foodies in Kerala. The cultural intermediaries which are catalytic to the alteration in the food consumption of the Keralaite people vary from social causes to economic rationale. Along with the modification of the ambience of hotels and street side food vending shops, the names too underwent transformations. The nostalgic names which anchor the consumer to a certain period in the history of Kerala magnify the prosperity and pristine ambience in the then time. This overcharging of the irrecoverable nostalgic past has an economic gain pervading underneath. This paper titled 'The Nostalgic Nomenclature of Eateries: A Cultural Reading of the Names of Street Food Stalls in Kerala' attempts to analyze the change in the names of hotels and street side food vending shops in Kerala in this decade. This study is backed by the application of Cultural Studies, the emerging theoretical area in the 21st millennium. The names of eateries in Kerala with the accompaniment of the typographies which take us to the past is a tool in the hands of late capitalism which opt for an aristocratic past which the modern society tries to recreate in such a manner that the consumers are wooed to move to them to experience the taste of the past.

Key words: Nomenclature, Eateries, Typography, Cultural intermediary

The socio-cultural variations in the much acclaimed conservative society in Kerala during the last decade resulted in the drastic perceptible revolutions in all the spheres which constitute the culture of Kerala like food habit, dress code, architecture, typographical variations and the like. Various cultural intermediaries in the guise of political decisions and economic policies in Kerala and in other parts of the world were instrumental in bringing out these discernible transformations in the state. Of the various realms in which the changes were observable, the transition in hotel industry was highly noticeable in the last decade. The food culture in Kerala underwent far-reaching transition and it culminated in catapulting the number of roadside food vending stalls throughout the thoroughfares of Kerala. These readymade eateries bear names which hook the consumers in such a depth that they induce the customers to approach them to taste the 'past'.

The tourism industry in Kerala promotes Kerala food to such an extent that the itinerary of the tourists from outside Kerala and India is inclusive of a dine out in a street food stall. The liquor ban in Kerala is one of the cultural intermediaries which necessitated the mushroom growth of street food stalls in Kerala. The country tea shops which were a catalytic arena in the cultural development of Kerala, which even occupied envious positions in Malayalam cinemas died out eventually with the economic changes that took place in the 1980s and 1990s. With the closing of a sizeable number of bar hotels in Kerala in 2014, the employees who were the part and parcel of such bar hotels had to find a means for themselves. At this juncture, many an employee resorted to establishing an eatery of their own and this trend catapulted the number of street side food vending shops.

The differentiating factor of the street food stalls to the well established hotels is the mind boggling names that they are adorned with. An Ernakulam based journalist remarked on *the Hindu* that:

The cityscape is dotted with eateries with *naadan* names. The script is often Malayalam, too. At first look, to an eye used to reading English name boards, these evoke curiosity. Owners say such names strike a chord, it is the comfort of familiarity. People instantly relate to it and know what to expect food-wise. (Anand 1)

Cultural studies observes that culture is not natural but it is produced. It creates a phony notion that it can be recreated as and when one wishes. Of the various factors which define the culture of a region involves the food habit of the people of that region. The application of Cultural Studies in the life of human beings is interconnected in such a manner that it oversees the mundane activities which define the culture of a domain. Pramod K. Nayar remarks of the role of Cultural Studies as :

Cultural Studies' interest in everyday life proceeds from what Raymond Williams called 'lived cultures', where culture is produced through everyday living: the food people eat, the fashions they adopt, the entertainment they prefer or the festivals they celebrate. Cultural Studies thus believes that people leading their everyday lives produce culture. Culture is not some distant realm produced elsewhere to be consumed by the people. It is the consequence of the responses. (Nayar 29)

When faced with Globalization and such liberal policies the culture of Kerala too got mixed up with the global culture. In such a juncture, the food culture in vogue today in Kerala comprises of Chinese, Arabian and European cuisine which is ubiquitous. This

meticulously produced food culture is the result of the factors that revolutionized the marketability of food culture regionally and globally. Pappi ice-cream with the caption 'Feel the taste of Europe' brought us the taste of Europe virtually. It is in the way of representation comes the concept of nomenclature of eateries. Attributing names to eateries required meticulous strategies. Of the importance of attributing suggestive names to eateries, Shilpa Nair Anand remarks,

Some names suggest specific genres of cuisine. 'Mappilakada' for instance. "We specialize in the cuisine from North Kerala, Mappila cuisine and I wanted a name suggestive of that," says Joju Ravindranath of 'Mappilakada'. The name was the result of intense brainstorming. Many options were considered before hitting upon this one. 'Mappila kitchen's' connect wasn't good enough, "The attraction of 'Mappilakada' was that it is the kind of name that would attract people." (2)

The names like 'Aadaminte Chayakkada', 'Erivum Puliyum', 'Uppum Mulakum', 'Poonkunnam Thattukada', 'Oru Kizhakkam Thattukada', 'Kumilakarans' Thattukada', 'Aliyante Chayakkada', 'Gafoorka's Thattukada', 'Aalibhai's Thattukada', 'Malabarinte Chayakkada', 'Ammacheede Adukala', 'Thakkaram', 'Oppolinte Chayakkada', etc. arouse various vibes in the consumer. One might wonder the significance of such names. In the peripheral sense names merely suggest an idea or a concept.

It is all the more arbitrary in the structuralist paradigm where the word does not literally have any denotation for the reality. About the working of language Peter Barry quotes Ferdinand de Saussure as,

He emphasized that the meanings we give to words are

purely arbitrary, and that these meanings are maintained by convention only. Words, that is to say, are 'unmotivated signs', meaning that there is no inherent connection between a word and what it designates. Saussure emphasized that the meanings of words are relational. That is to say, no word can be defined in isolation from other words. (Barry 40)

William Shakespeare underrated the relation between name and object which he exposed in *Romeo and Juliet* as 'What is in a name? that which we call a rose/ By any other word would smell as sweet' (Shakespeare *Romeo and Juliet*. 2.2.47-48). But a meticulous analysis suggests that a name invokes more suggestions.

A name is a marker which points one's status, community, locality and the age in which one was born and brought up and one's religious lineage. Thus a name involves a number of attributes and cultural underpinnings. A name is a landmark when it is applied to a building, apartment or a hotel. Names may carry definitions and meanings. Names have regional denotations and that they carry with them the regional distinctiveness. They also belong to birth and breed, title and tradition. Thus to cap it all, names are the markers which transcend time and space. As names are identifying factors which differentiate one human being from the other, names of organizations and such entities also differentiate them and make them unique.

The aftermath of the alarming pace in the momentum of cultural transition which took place in the world has infused in the Malayalees a cultural consciousness which has related the people to the past. The mind of the Keralite people has always cherished for a time which is long ago and far away like the Romantic locale. The ambiance of street food vending shops brings us to the far away and long ago time in the social milieu where we had a pristine

unadulterated cultural framework. Certain old names stick to our mind and along with them certain relations too. For instance 'Oppolinte Chayakkada' invokes a relational bond with an older sister. In the similar fashion 'Ammacheede Adukala' conjures up a number of attributes like motherliness, purity in the preparation of food and the affection in serving.

Culture is produced in a society in connection with the changing economical and social powers. A structured observation proves that culture is dynamic in the parlance that it undergoes drastic changes from time to time. A synchronic and diachronic study of culture reiterates that culture, including food culture in Kerala is being modified by various factors including the economic factors which transformed the lifestyle thereafter. Even in such a context, it is perceptible that a linking with the past is apparent in the mind of the consumers. As they have reached to such an extent that a reversal to the past tradition and relationship has become nostalgic. Hence a longing for the past is noticeable. The tourism industry in Kerala is centered on foregrounding the exotic relics of the past to market them. Though the consumer is linked to the past, the factor of novelty is an inevitable factor which allures the consumer to a product. Regarding novelty in the cultural context, Pramod K. Nayar remarks:

A regular consumer of coffee has to be persuaded that the new brand is an improved, a novel version of what she consumes every day. The new brand cannot *not* taste like coffee- it cannot be so novel- but should have an additional feature that makes it novel, but remains coffee. Consumer culture is based on a cult of novelty. The cult of novelty generates a two-pronged rhetoric: a rhetoric of pluses and a rhetoric of the 'new-now'. Novelty occurs not only when the object is radically

new but also when there has been some *delay* between the moment consumption and the past experience. (Navar 142)

The concept of novelty is entwined with the repetition of the old cultural concepts and artifacts. Novelty is a way of dislocating the previous set of experiences. In such a juncture, it is discernable that the culture of a period becomes novel after a break from the tradition. This break has restored the culture which existed in Kerala in the sphere of food consumption in the current decade in the guise of names and ambiance. The term 'past' points to 'a time which existed in the past' and hence it is an irretrievable entity and whatever existed in the past cannot be brought to the present. The effort to bring the past to the present is a futile task and it cannot survive in the present. The attempts to reproduce the old customs and traditional beliefs are perceptible in religious beliefs and the related festivals. In the context of Kerala the festival of 'Onam' generates a set of cultural codes and conventions regarding dress and food. But with the passage of time, the festival of Onam has been commercialized to such an extent that the purity ascribed to the rituals and cultural codes has been dropped. The factor of novelty has been mixed with festivals in such an extent that the festivity is misplaced. This commercialization in festivals is made popular by the capitalist market where novelty thrives linking with the past. An artificial reproduction is seen in the market. For instance synthetic banana leaf is replaced with the natural one. But the banana leaf is made inevitable while serving food. How Louis Althusser defined the term 'interpellation' is what the food industries do in Kerala. We are made feel to choose from alternatives, but ultimately there exists no choice at all. Peter Barry rightly illustrates it as, "The 'trick' whereby we are made to feel that we are choosing when really we have no choice is called by Althusser *interpellation*. Capitalism, says Althusser thrives on this

trick: it makes us *feel* like free agents while actually imposing things up on us" (158)

In the purview of intertextuality the relation of the names of the eateries with the tradition is irrevocable. The allusive names with the graphemes hook the memory of the customer. This text immediately connects the consumer to the desired period or relationships in a certain period of time as it existed in the region. R.L.Trask summarizes intertextuality as:

But Kristeva's intention is much broader applicability: she sees every text as constructing an intertext in a succession of texts already written or yet to be written. A version of this idea has recently begun to be incorporated into the linguistic analysis of texts. The general idea is that a text does not exist in isolation and cannot be fully appreciated in isolation; instead, a full understanding of its origins purposes and form may depend in important ways on the knowledge of other texts. (Trask 132)

The intertextuality with regards to the text of the appellation of the eateries suggests the association of the names to a historical period and the structure prevalent in the region. Typographical features of the words clearly embody a period in the history of a region when they were dominant in different spheres of life. The typography very often specify the regional and many a time the communal variants. For instance, 'Aalibhai's Thattukada' in the script of Arabic typography speaks a volume of factors that of the dishes available there plus the communal factors inherent in it. So also is 'Aadaminte Chayakada' which articulates suggestions like the Biblical forefather and the Islamic food variants offered there. What Shakespeare thought about in the seventeenth century of the

efficacy of names was found superficial in the nomenclature of eateries in Kerala with the accompaniment of variant typographies.

The advent of English language to Kerala crippled the learning and currency of Malayalam language. The excessive use of English was in vogue in all the spheres of life. Hence the change of names from anglicized names to vernacular ones was eye catching. This shift also incorporated the system of transliterated names with the regionalist undertones. This transition itself suggests a break away from the overemphasized anglicized names to the nostalgic native names. In the place of English words like 'hotel' or 'restaurant', the vernacular variants like 'thattukada', 'chayakkada' and the like have made their presence felt in the transition from the present to the past. Even the regional variation of the Malayalam word is employed to bring in novelty as seen in the name 'Thakkaram' which is Malabar regional variation of 'Salkaram' – meaning welcome.

Regarding the taste of food Ms. Athira Sukumar, a customer once remarked in her online comment about 'Alibhai's Thattukada' as, "Sink your teeth into any of these and feel the waves of nostalgia coming through" (2). The sense of nostalgia is aggravated with the replacement of the ambience of the past architecture patterns. The people at the helm in serving food in the guise of orthodox Christian grandmothers and Muslim 'Beevis' add charm to the sense of nostalgia which is a gimmick in the capitalist system of marketing. Past is an irrecoverable 'period' which can be recreated without any ingenuity. The value system in the current scenario has reached a position that it longs for a return to the past. At this juncture a veritable return incorporating the life style, the architecture and the dress code is unachievable. This sense of longing for a resort in the past is very well exploited by the names, ambience and the costume which can arouse a virtual sense of belonging to the past. This makes belief structure in which the food which is claimed to be 'naadan'

infuses in the consumer a sense of simulated satisfaction which is the result of being 'naadan'.

To cap it all, the capitalistic effort to recreate a regional corner in the fast developing global culture resulted in the simulation of a culture which lost its root from the prevailing cultural context. Every effort to recreate this elite regional culture became cultural artifacts in the market. A longing for the past culture and relational bond instilled in the capitalist community to resort to the practice of vernacular nomenclature as a way to hook the consumers to the nostalgic past. The vernacular names that are placed before the consumers locate the consumers in a slot where they have distinct experiences of the past.

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मनु भण्डारी की कहानी 'आकाश के आइने में' चित्रित नारी समस्याएँ

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साहित्य आँखें है। जो देखता भी है और दिखाता भी। साहित्य की आँखों से हम समाज देखते है और समाज की आँखों से साहित्य देखते है। साहित्य की अनेक विधाएँ होती हैं। उपन्यास, कहानी, नाटक, आलोचना, आत्मकथा, निबंध आदि साहित्य की प्रसिद्ध और सफल विधाएँ हैं। अन्य गद्य रूपों की अपेक्षा कथात्मक साहित्य में पाठक की रुचि सम्भवतः सर्वाधिक तृप्त होती है। इसी कारण आधुनिक युग में कथा साहित्य का अभूतपूर्व विकास हुआ। इस में कहानी सब से मनोरंजक साहित्यिक विधा बन गयी। इसके ज़रिए समाज की यथार्थ स्थिति सरल एवं मनमोहक रूप में उजागर होती है।

हर युग में समस्याएँ रही हैं। लेकिन समस्याओं का स्वरूप, तीव्रता और विस्तार अलग-अलग है। इन सभी समस्याओं को नई कहानीकारों ने अपनी कहानियाँ द्वारा प्रस्तुत करने की कोशिश की है। ऐसे साहित्यकारों में अग्रणी है मनु भण्डारी। मनु भण्डारी परिवार, समाज, राजनीति, धर्म, प्रशासन, शिक्षा आदि क्षेत्रों में उभरती समस्याओं का अंकन करने में कटिबद्ध दिखती है।

मनु भण्डारी अधिकांशतः ऐसे स्त्री पात्रों को गढ़ा है जो अपने परिवार से परे जाकर अपनी पहचान बनाना नहीं चाहती बल्कि पारिवारिक संबंधों के घेरे में रहकर ही समस्याओं से जूझते हुए अपने अस्तित्व को बरकरार रखने का प्रयास करती है।

'आकाश के आइने में' कहानी में शहरी एवं ग्रामीण नाटियों की समस्याएँ मनु जी ने उजागर किया है। कहानी की शुरुआत शहर से होती है। शिपा पति से अलग होकर एक स्कूल चलाती है। उसे स्कूल में लेखा, दिनेश, सुषमा, प्रीति जैसे लोग मिलते हैं। नौकरी-पेशा सुषमा के माता-पिता उसका विवाह करना नहीं चाहते हैं। लेकिन वह महिम से कोर्ट भेरेज करने की तैयारियाँ चदु करती है। प्रीति घर की देखभाल के लिए नौकरी छोड़ती है तो पति नाराज हो जाता है। यह सब शहरी

स्त्री-पुरुषों की समस्याएँ हैं। लेखा नौकरी करती है, इसके साथ घर की देखभाल और पढ़ाई भी करती है। बहुत थके होने के कारण लेखा-आराम के लिए गाँव जाती है। वहाँ से गाँव की कहानी शुरु होती है। लेखा का परिवार संयुक्त परिवार है। परिवार में लोगों की अपनी-अपनी समस्याएँ हैं। लेखा की ननादिया गौरा नौकरी करना चाहती है। लेकिन माँ को पसंद नहीं है। जितनी दिन-रात अपने-आप को कोसती है। लेखा के देवर रमेश और सुरेश को भी अपनी अपनी समस्याएँ हैं। आर्थिक परेशानियाँ भी हैं। लेखा रूपए देकर इसका हल करने की कोशिश करती है। इस आर्थिक विषयाता के समय माँ रित्तेदार की शादी में ज्यादा पैसा खर्च करती है। इन सब के बीच लेखा को घुटब होता है और वह शहर जाने का इरादा बनाती है।

'आकाश के आइने में' कहानी में संयुक्त परिवार के संबंधों की त्रासद कथा प्रस्तुत की है। कहानी की नायिका लेखा का परिवार संयुक्त परिवार है। सास, ससुर, जेठ-जिठानी, दो अविवाहित देवर, अविवाहित ननद आदि सब घर में हैं। सह निवास होने पर भी परिवारवालों के बीच सहयोग की भावना की कमी है। सभी के बीच अनाम दूरियाँ हैं और सभी का दम-पुट रहा है। सब लोग इस संक्रांत वातावरण से मुक्ति के लिए छटपटा रहे हैं। परिवारवालों पर अम्मा जी का व्यक्तिव हावी है। फल स्वरूप दादा-दादी, माता-पिता, पुत्र-पुत्री, देवतानी-जिठानी, सास-बहू संबंध दरकरने लगी है।

नायिका लेखा की जिठानी संयुक्त परिवार में रहने के कारण हमेशा जल-धून जाती है। उसके मन में किसी के प्रति स्नेह पूर्ण भावना नहीं है। वह किसी से जुड़ नहीं पाती। सास लेखा से कहती है - "बहु बड़ी के लक्खन तो तुम देख ही रही हो। उल्टे-बैल्टे कोसती है। उसे तो घर के हम सब जहर लगे।"³⁴

व्यक्तिवादी भावना का विकास संयुक्त परिवार के वातावरण को दूषित कर सकता है। लेखा की जिठानी का विचार है कि देवर-देवतानी शहर में रहकर मज़ा लूटते हैं और वह चौके-चूल्हे में अपने आपको खपा रही है। संयुक्त परिवार की नींव को मजबूत रखने के लिए परिवार के मुखिया का सब के प्रति समान व्यवहार करना अनिवार्य है। लेखा के प्रति सास का भेद नीति का व्यवहार जिठानी के मानस में देवतानी के प्रति द्वेष एवं जलन पैदा करती है।

आज दम तोड़ते संयुक्त परिवार में संबंधों का आधार अर्थ बना है। प्रस्तुत कहानी की चाची परिच्छका है। वह मन ही मन चाहती है कि सब लोग उसे स्वीकार

करें। परंतु जीवानी उसे घृणा से देखती है। उसके हिस्से का सारा पैसा दबाया गया है, जिसके कारण उसे अपनों के खिलाफ ही मुकदमेबाजी करनी पड़ी है। उसकी असहाय स्थिति इन शब्दों में प्रकट है, “अब तो समझ में नहीं आते, यह पहाड जैसी झिंटनी कैसे काटेगी।”^{२३} आज के अर्थ प्रधान युग में संबंधों की ऊष्मा खो गयी है और संबंधों में कड़वाहट पैदा हो गयी है। कहानी की नायिका लेखा चाची के लिए साड़ी लेकर आई है। लेकिन सास साड़ी अपनी ओर सरकाती है। इस प्रकार गावों में संयुक्त परिवार दम तोड़ ही नहीं रहे हैं, पर समाप्त हो रहे हैं। इस संदर्भ में शैलेन्द्र सिंह का कथन उल्लेखनीय है, “...परिवार न टूटे इस के लिए जरूरी है कि सभी सदस्य एक दूसरे के रिश्ते की इज्जत करें।”^{२४}

परिवार के किसी सदस्य का निरंकुश एकाधिकार परिवार के एकीकरण प्रेम, त्याग आदि को तहस-नहस कर देता है। किसी एक का एकाधिकार सदस्यों की आकांक्षाओं को चकना चूर कर देता है। फलस्वरूप परस्पर संबंधों में दूरियाँ पैदा होती है। परिवार के हर सदस्य अपनी समस्याओं को लेकर घुटन महसूस करते हैं। कहानी में अम्मा जी का व्यक्तित्व सभी पर हावी है। परिवारवाले अपने व्यक्तित्व खो बैठे हैं। पुत्री गौरा पढ़ना-लिखना और नौकरी करना चाहती है, पर कर नहीं पाती। उसका व्यवस्थित रहना भी माँ को असह्यता है।

संयुक्त परिवार के परस्पर संबंधों में आये दरार के कारण शाहर से आई बहू लेखा भी इन सब के बीच अपने आपको पताई समझकर वहाँ से जल्द ही लौट जाना चाहती है। संयुक्त परिवार में अपनी आकांक्षाओं, इच्छाओं का गला घोटता हुआ अनुभव कर हर कोई मुक्ति के लिए छटपटा रहा है। पर कहीं भी आकांक्षा खुला नहीं है।

वर्तमान युग अर्थ प्रधान युग है। ‘अर्थ’ ही मानव जीवन में महत्वपूर्ण स्थान ले रहा है। व्यक्ति का महत्व आर्थिक आय पर निर्भर हो रहा है। आर्थिक अव्यवस्था का सब से अधिक प्रभाव परिवार और पारिवारिक संबंधों पर पड़ा है। संबंधों और रिश्तों के निर्धारण में अर्थ एक निर्णायक तत्व बन गया। डॉ. ज्ञानवती अरोड़ा की राय में, “नारी की स्थिति में सर्वाधिक परिवर्तन ‘अर्थ’ के कारण हुआ नौकरी और उत्तराधिकार ने उसकी स्थिति को बिल्कुल बदल दिया। आर्थिक विवशता ने ही पारिवारिक मूल्यों को सर्वाधिक तोड़ा।”^{२५} ‘आकांक्षा के आइने में’ की दुष्पमा भी माता-पिता की व्यवहारवादी दृष्टि के कारण घुटन महसूस करती है। वह नौकरी के साथ दो-दो ट्यूशन भी देती है और घर का खर्च चलाती है। लेकिन

दुष्पमा विवाह का निर्णय स्वयं लेने की वजह से घरवाले विरोध करते हैं। वह कहती है, “पिछले तीन साल से मैं केवल घरवालों के लिए मर खप रही हूँ।... पर इन लोगों से इतना भी नहीं होता कि मेरी हॉस्टी-ट्यूशी में भी साथ दें।”^{२६}

अपने सामाजिक-ऋण बोध-से प्रेरित होकर जिन समस्याओं ने मनु भण्डारी के मन-मस्तिष्क को तीव्रता से प्रभावित किया, उन्होंने उन मुद्दों को अपने साहित्य के माध्यम से उद्घाटित किया है। बदलती स्थितियों और मूल्यों के परिवर्तन, संक्रमण एवं विघटन के कारण जिन समस्याओं ने जन्म लिया है और समाज को दबाव लिया है, उसके सटीक अभिव्यक्ति करने में मनु जी सक्षम हुई है।

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कुमार अंबुज की कविता में उत्तर आयुनिकता

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वैश्वीकरण के परिणाम से उत्तर आयुनिक जीवन जगत अमानवीय माहौल से जटिल हो गया है। समकालीन समाज में दिन ब दिन बढ़ती स्वार्थता, धनलिप्ता, पदमोह आदि के कारण अवसरवादिता, समझौता परस्थता, फ़रतता, हिंसा आतंक आदि अमानवीय भावनाएँ बढ़ गये हैं। सत्य और अहिंसा के बुनियाद पर स्थापित भारतीय संस्कृति में नष्ट होनेवाली इनसानियत और भ्रातृत्व भावना को बचाने और जगाने के प्रयत्न में समकालीन कविता कर्मनिरत है। वर्तमान समय का नज़्म पकड़कर समकालीन कविता को दिशव्यापी करनेवाले कवियों में कुमार अंबुज का अद्वितीय स्थान है।

कुमार अंबुज ने संवेदनशीलता मौलिकता और अनुभव के बल पर वर्तमान समाज और जीवन को अपनी रचनाओं में समाहित किया है। उनकी रचनाओं में एक ओर हाशिएकृत मामूली आदमी की पीड़ा, संघर्ष, दर्द और तनाव का चित्रण है तो दूसरी ओर संवेदनशील पाठकों के हृदय को जगाने की अत्युत्तम क्षमता भी छिपी हुई है। प्रौद्योगिक और मीडिया संस्कृति के जाल में 'फँसकर खो गये मानवीय संवेदना को वापस लेने की निरंतर कोशिश में उनकी काव्य संवेदना पाठकों के हृदय को झकझोरती है। वर्तमान जीवन में रित्तों के अभाव संबंधों की स्वार्थपरता, संवेदनहीनता, अपनी ज़मीन की स्मृतियाँ आदि चित्रण के साथ प्रौद्योगिक संस्कृति से पुनर्जन्म पाये पूँजीवादी संस्कृति का नया रूप, मीडिया, बाजारवाद उपभोक्तावाद, कंप्यूटर संस्कृति का चकाचौंध, विस्थापन की समस्या आदि प्रवृत्तियों ने अंबुजी की कविता को उत्तरायुनिक कविता का ज़बरदस्त दस्तावेज़ बनाया है।

अंबुजी ने अपने जमाने की बहुमुखी चेहरे को देखा और उसे कविताओं अंकित किया। उनकी राय में यह मुखौटो की संस्कृति है। इस संस्कृति के पत्रों का बाहर प्रकट रूप असली रूप नहीं असली रूप तो मुखौटो में छिपा पड़ा है जो मौक़ापरस्त है जिसमें मामूली आदमी को जाल में फँसाने की अदृश्य क्षमता है लोगों में परंपरागत मूल्यों के प्रति एक विस्तर्क भाव उत्पन्न करने का ताकत है। सांस्कृतिक

विरासत का मानने वाले कई मूल्यों में एक तरफ़ की धुँधलापन फैल गये है कुमार अंबुज की कविता विपक्षी कविता है। व्यवस्था में इनसानियत के खिलाफ़ होनेवाले तमाम हस्तकरो के विरुद्ध उनकी आवाज़ बूँलद है। मनुष्य को केवल उपभोक्ता का बख़तर पहनाने वाले भूमंडलीकृत संस्कृति और तमाम भ्रष्टाचारों को अतिरंजित करके प्रेषकों में कुप्रभाव लानेवाले मीडिया संस्कृति के विपक्ष में खड़ा होकर अंबुज की कविता जनसाधारण को शोषण से बचाने का प्रयास करती है, अनैतिकता और अमानवीयता का प्रतिरोध करती है। अपने विरासत के प्रति श्रद्धा भाव तथा अतीत की गहरी समझ उनकी कविता की स्वास्थियत है। लोकोन्मुखी दृष्टि उनकी कविता की पहचान है वे अपनी कविता में बार बार अपने गाँव की ओर, अपने परिवेश की ओर मूड़ते हैं। 'जैसे मेरे ही शहर' की पंक्तियाँ देखिए-

“पराए शहर में थोड़ी सी फ़ुरसत हो

तो धीरे धीरे लगता है कि यह शहर अजनबी नहीं

कोई मोहल्ला ही है अपने शहर का जहाँ

किस्सी वजह से आना नहीं हो पाया अब तक

यहाँ भी बेकरी की उतनी छोटी दूकान उतना ही काम सामान

जितना मेरे घर के बग़ल की दूकान में”

अनंतिम, कुमार अंबुज, पृ. ७३

जीवन मूल्यों का आधाक्षर व्यक्ति परिवार से सीखती है मनुष्य सामाजिक प्राणी होकर भी परिवार से रिश्ता सुदृढ़ बनाकर पारिवारिक कर्तव्यों को निभाना है शहर के भीतर छोटी छोटी दूकानों को देखकर कवि के मन अपने गाँव की याद करता है हारमोनियम की दूकान से शीर्षक कविता में शहर में एक पुतानी सी दुकान दिखाई पड़ता है जिसका ग्राहक एक बूढ़ा आदमी था जो हारमोनियम पर इतना तल्लीन है कि बार बार हारमोनियम पर दबा रहा था। यही दृश्य सुनकर कवि के मन में उनके घर की भजन संख्याओं की याद आताह

“मुझे याद आ रहे थे वे सारे गीत जिनमें जाता रहा हारमोनियम और
बचपन की भजन संख्याएँ

जिनमें हारमोनियम बजाते थे ताक़ तो रुक जाता था पूर्णमासी का चाँद”

(अनंतिम - पृ. ६०)

अंबुज की कविता में उत्तरायुनिक संस्कृति में क्षति पहुँचाने कई पुतानी स्मृतियों को पुनःप्रतिष्ठित करने का प्रयास करते अपने इर्द गिर्द की जो चीज़ें कवि

को अपने पुराने घर बाल्यकाल के अनुशासित जीवन की याद दिलाती है वैश्वीकरण और प्रौद्योगिक विकास के कारण हमारे मुहल्लों में प्रांतिकारी परिवर्तन आ गये हैं ग्रामांचल को छोड़कर शहर में आवास का प्रबंध करते हैं। पुराने आंचलों की महक आज याद मात्र रह गये हैं। लेकिन पुराने ग्रामांचल की कई चीजें अंबुजी की कविता में सुरक्षित हैं। शहरीकरण और विस्थापन की समस्या को लेकर कई कविताएँ लिखी हैं 'समाज यह' शीर्षक कविता में हमारे संस्कृति में हमारी भाषा तक में घोर परिवर्तन डालनेवाले विज्ञान आविष्कार और खोजों पर विचार करते हैं भूमंडलीकरण की प्रक्रिया में पुरानी संस्कृति की कई चीजें पीछे छूट जाती हैं। भाषा का वह शुद्ध रूप के बदले अब अंग्रेजी भाषा के मिश्रण से एक नवीन संस्कृति आ गयी है जिसमें-

विकास हुआ कुछ इस तरह कि पीछे छूट गयी भाषा
पीछे छूट गए बिंब और अलंकार

किस छंद से कहूँ अपनी बात जब टूट चुकी है मात्राएं
टूट रहा है जीवन का ही छंद" (अनंतिम - कुमार अंबुज - पृ. ६४)

छोटे पुराने सार्वजनिक चीजें अब खंडहर बन गयी हैं वहाँ आप बड़े इमारतें स्थान ले लिया हैं जिनकी तामझाम में साधारण मनुष्य को जीना मुश्किल हो गया है। विचारों में और दृष्टि में बदलाव आया है पुराने जीवन आदर्श अब आदर्श नहीं है उस स्थान पर नयी मान्यताओं को स्वीकार है, जीवन ढंग में और व्यवहार में बदलाव आ गया है। वैश्वीकृत समाज की ये विशेषताएँ काव्य का विषय है 'तबादला' शीर्षक कविता अपनी जगह छूट जाने के आदेश मिलने पर जगह छूटने के साथ अपने बहुमूल्य कई चीजें छूटने का एहसास है-

"जगह के साथ छूट जाते हैं कुछ दोस्त
परिचित चेहरे और उनकी आँखों की चमक"

(अनंतिम - कुमार अंबुज - पृ. ८९)

छूट जाते हैं पड़ोस की बच्ची और उसकी तुलसी बातचीत छूट जाता है
खिड़की से दिखता गुलमोहर का पेड़"

वैश्वीकरण की प्रक्रिया में पुराने सभी चीजें छुट जाती हैं और वे सब केवल स्मृतियाँ तक सीमित रह गया है। मित्रों, पड़ोसियों, जाने पहचाने सभी चीजों के साथ जाना पहचाना रास्ता भी पीछे छुटता जाता है वैश्वीकरण और उपभोक्तावाद के भागदौड़ में विस्थापन की समस्या इसकी पराकाष्ठा पर पहुँचा है। अबोहवा के बदलाव के कारण व्यक्ति की मानसिकता से परिवर्तन आया है। पुराने तमाम चीजों

का अस्तित्व भी भिट जाता है। हमारे विरासत, इनसानियत और मूल्य भी पीछे छूट गये हैं 'इस तरह विदा' शीर्षक कविता में उपभोक्ता संस्कृति की और हमारा अभियान देखकर ऐसा लगता मानो हम एक दूसरे की हत्या करके जा रहे हो इस तरह एक दूसरे का सम्पूरा अस्तित्व, सब दृश्य अदृश्य चीजें दुनिया से भिटा ही दिया हो हमें ऐसा लगता है-

"जैसे हम एक जीवन में से अचानक उतरकर
बैठ गए किसी दूसरे ही जीवन में" (अनंतिम - पृ. ९०)

विस्थापन की प्रक्रिया माँ बाप को घमण्ड करते हैं। ग्रामांचल की शुद्ध हवा में तल्लीन रहनेवाले तथा विरासत के सही जड़ों को मुट्ठी में सुरक्षित रखने वाले बुजुर्ग माँ बाप को यह विस्थापन एक अभिशाप है अपनी परंपरा है, अपने जमीन छोड़ नहीं सकते 'माँ अतिथी है' शीर्षक कविता में शहर में बैठे के घर जाने वाली माँ का चित्रण से

"माँ घर में आई है लेकिन वह अतिथि है
उसके पास उसके हजारों बाकी रह गए काम है
उसके पास उसका अपना घर है

जिसे लंबे समय तक नहीं छोड़ा जा सकता सूना"

अपने जमीन की महक में तल्लीन माँ अपना घर छोड़ नहीं सकती, बेटे के घर के नवीनता को अपना मान नहीं सकती इसलिए वह बेटे के घर में अतिथि है। उपभोक्ता संस्कृति की धमनभट्टी में गिरकर नये जन्म लेने वाले नई पीढ़ी नयी संस्कृति का स्वीकारते हैं पुरानी जगह पर्वज चेहरों की तरह स्मृतियों से, किताबों से बाहर... निकालने हैं लेकिन विरासत पर अटूट विश्वास रखनेवाले पुराने पीढ़ी को पुराने चीज नष्टकर नया चीज अपनाना मुश्किल है।

उपभोक्तावादी दुनिया का यथार्थ चित्र उभरनेवाली कविता है वह पेशाबधर। नौकरी की खोज में या सुविधाओं की मोह में लोग गाँव छोड़कर शहर की भीड़ में रहे थे। शहर की भीड़ में बाजारों के बीच ऊँचे दीवारों से ओटक पेशाबधर स्थापित है दीवार पर कोकाकोला का विज्ञापन चमक रहा था भीतर गुजरने पर अमोनिया का दुर्गंध भरे हैं भीतर के दौने घर भंटे हुए थे तब तक कवि के पीछे लार्डन में आ चुके थे चार लोग। बाहर निकल का लेखक ध्यान से देखा-

तब ध्यान से देखा कि पेशाबधर
बीस कदम की दूरी से भी नहीं लगाता था पेशाबधर

उसके दूसरी तरफ थी टेलिविजन की दूकान वहीं दूकान के आगे फूटपाथ पर रखे हुए थे टेलिविजन के मॉडल एक के उपरएक

लगाता था कि किसी का भी स्विच ऑन किया जाए तो सामने आ जाएगा पेशाबघर की दीवार पर बन हुआ कोकोकोला का विज्ञापन' (अनंतिम - पृ. ८२)

भीतर की तमाम दुर्गंधों, बुराइयों को छिपकर बाहरी तामझाम दिखाने की अभूत क्षमता नवीन संस्कृति को है। उपभोक्तावादी संस्कृति बहुलपिया की संस्कृति है इस में छिदगी बिताने के लिए अपने यथार्थ रूप पर पर्दा डालना ही पड़ता है।

“मैं नींद में का एक अबोध बच्चा

हर सुबह फिर जागता बहुलपिए की तरह

इतने रूप बदलता हुआ भूल चुका हूँ खुद को ही

एक कंधे पर रखता हाथ धकियाना दूसरे को

हँसता हुआ अचानक होता क्रोधित

इतना बहुलपिया कि ठीक तरह न बच्चे समझ पाते हैं न पत्नी”

(अनंतिम - पृ. ३७)

बहुलपियापन जीवन का एक तरीका बन गया है इसी व्यक्तित्व के कारण खुद को भूल चुका है और वह पत्नी और बच्चे के लिए भी अजनबी लगती है। इस प्रकार आत्मीयता का अभाव इस संस्कृति की खासियत है।

झूठ, और छलकपड़ की दुनिया में हम रहते हैं। इस संस्कृति के तमाम क्षेत्र भ्रष्टाचार से मैला हुआ है। हर एक का एक ही लक्ष्य है किसी भी तरह धन इकट्ठा करना। इस भाग दौड़ में शुद्ध और पवित्र माननेवाले हमारे विरासत के कई मूल्यों में विघटन हुआ है। आयुर्वेद चिकित्सा विधि हमारे देश का अपना था। आयुर्वेद विधि के लिए भारत अंतर्राष्ट्रीय स्तर पर भी मजहूर था जो शुद्ध वातावरण का प्रतीक था। अंबुज की 'आयुर्वेद' शीर्षक कविता में चिकित्सा के क्षेत्र में हुए भ्रष्टाचार पर इशारा करता है। अपने इर्द गिर्द की औषधियाँ से बनी हुई आयुर्वेद अब-

“जो डूब रहा है सभ्यता के उतर औद्योगिक समुद्र में

विस्मृति की सीमा पर खड़ा है अनुपान भेद का ज्ञान

वैशलोचन पाद शिलाजीत भृंग महारसुदर्शन

तेजोमय रूप सभी इबते हुए अथैर्य के पोखर में गिरते हुए पूँजी के गर्त में”

(अनंतिम - पृ. ३९)

इस उपभोक्तावादी समाज में आयुर्वेदिक द्रव निर्माताओं का लक्ष्य भी धनार्जन है 'चार रुपए का आँवला बिक रहा है सौ रुपये में'। इस प्रकार आयुर्वेद होथो पैथी का क्षेत्र ही नहीं संस्कृति के तमाम क्षेत्र भ्रष्टाचार से मैला हुआ है। चापलूस्ती, अवसरवाद, मौकावसतता समझौतावाद आदि इस संस्कृति की विभिन्न चेहरा है एक आदमी जंगल में शीर्षक प्रतीकात्मक कविता में मनुष्य के चापलूस्ती मनो भाव का चित्रण मिलते हैं -

अमीरी रेखा में संकलित स्वातः सुखाय कविता की पंक्तियाँ देखिए-

जो स्वातः सुखाय था

उसकी सबसे बड़ी कमी सिर्फ यह नहीं थी

उसे दूसरों के सुख की कोई फिक्र न थी

बल्कि यह थी कि वह अक्सर ही

दूसरों के सुख की

निगलता हुआ चला जाता है” (अमीरीरेखा - कुमार अंबुज - पृ. ३९)

नये उपभोक्तावाद पर आधारित पूँजीवादी संस्कृति में व्यक्ति स्वतंत्र्य का दुरुपयोग करते हैं। वह केवल अपनी स्वतंत्रता का सोच रखते हैं दूसरों के सुख का फिक्र नहीं साथ ही वह अक्सर दूसरों के सुख का निगलता हुआ चला जाता है। अपने सुख वृद्धि के लिए दूसरों की स्वतंत्रता का हनन करते हैं।

संस्कृति में गलतियों पर समझौता करने वाले लोगों के संस्कृति में हम जीते हैं। ऐसे लोगों का दिमाग साफ करना मुश्किल है 'अन्याय' शीर्षक कविता में इसका उल्लेख है अक्सर हम सोचते हैं समाज में अन्याय है वह किसी के द्वारा किसी और पर किया जाता रहा अन्याय है। एक बार फिर सोलने पर हम महसूस करते हैं कि हम ने जो किया वह भी अन्याय है।

“फिर सोचेंगे तो आयेगा याद कि तुमने भी

लगातार किया है अन्याय

जो ताकत से किया या निरीह बनकर सिर्फ वह भी नहीं

जो तुम प्रेम की ओट लेकर करते रह वह भी अन्याय ही था”

(अमीरी रेखा - कुमार अंबुज - पृ. २९)

कुमार अंबुजी की कविता में उपभोक्तावादी समाज में लोगों की बदलती

मानसिकता और बदलते मूल्य बोध का चित्रण है। वे अपने कविताओं द्वारा सामसामयिक भारतीय स्थितियों वस्तुनिष्ठ निर्मम और लगभग निराश कर देने वाले स्थितियों का आकलन करते हैं भारत प्रौद्योगिक और वैज्ञानिक उन्नति प्राप्त किए हैं लेकिन भारत के मामूली आदिमियों की आर्थिक सामाजिक स्थिति में कोई भी बदलाव नहीं आया है। वे आज भी हीन जीवन बिताने वाले हैं उनकी ज़िंदगी आर्थिक उपीड़न ग्रस्त और बीमारी से पीड़ित है गरीबी की नर्क में फैक्सिच्यों में झुलसने वाले कटोड़ों बच्चे जर्जर शोकमय शरीर से मुट्ठुटाती स्त्रियाँ अदृश्य सुखा की प्रतीक्षा में हाड तोड़ मेहनत करनेवाले कटोड़ों जनसाधारण की मुश्किलें ये तमाम चित्रण अंबुजी की कविता को समसामयिक कविताओं के जीवंत साक्ष्य बनाते हैं। "कुमार अंबुज की कविताएं हमारे आज तक के हालात का सीधा प्रसारण है जिसमें देखी हुई आँख कभी स्रगंध से बचती नहीं है" - (अतिक्रमण - आवरण पृष्ठ) अपनी कविता द्वारा कवि ने भूमंडलीकृत समाज की कामियों को भिटाकर एक स्वस्थ शोषण विहीन समाज पर आधारित गतिशील कर्मशील समाज का स्वरूप देखा है अंबुज जी उम्मीद करते हैं पूँजीवादी समाज अंततः उस मानवीय समतावादी और सामाजिक न्यायपूर्ण व्यवस्था से प्रतिस्थापित हो सकता है।

Anxiety, Depression and Stress among Recovering Alcohol Dependent Individuals in Kerala

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Abstract

Alcohol dependency is a chronic disease characterized by uncontrolled drinking and preoccupation with alcohol. Stressful events such as bereavement or losing a job can also trigger heavy drinking. This can then lead to alcohol dependence and other complications. Major objectives of the study is to examine the anxiety, depression and stress of individuals with alcohol dependence and the influence of demographic variables such as age, marital status, income and place of residence upon anxiety, depression and stress. Samples (N=35) were selected through random sampling method from were person attending alcohol anonymous group. The result shows that there is no significant difference between marital status of the respondents on depression, anxiety and stress. Anxiety, depression and stress did not vary among individuals belonging in the urban and rural area. Further, it showed that age is not related with anxiety depression and stress.

Key words: Alcohol dependence, Anxiety, Stress, Depression.

Introduction

Alcohol dependence is a substance related disorder in which an individual is addicted to alcohol either physically or mentally, and continues to use alcohol despite significant areas of dysfunction, evidence of physical dependence, and/or related hardship. According to the DSM-IV criteria for alcohol dependence, at least three out of seven of the following criteria must be manifest during a 12-month period:

- Tolerance
- Withdrawal symptoms or clinically defined alcohol withdrawal syndrome
- Use in larger amounts or for longer periods than intended
- Persistent desire or unsuccessful efforts to cut down on alcohol use
- Time is spent obtaining alcohol or recovering from effects
- Social, occupational, recreational pursuits are given up or reduced because of alcohol use
- Use is continued despite knowledge of alcohol-related harm (physical or psychological)

The development of alcohol dependence is a complex and dynamic process. Many neurobiological and environmental factors influence motivation to drink (Grant, 1995; Samson & Hodge, 1996; Vengeliene, 2008; Weiss, 2005). At any given time, an individual's propensity to imbibe is thought to reflect a balance between alcohol's positive reinforcing (i.e., rewarding) effects, such as euphoria and reduction of anxiety (i.e., anxiolysis), and the drug's aversive effects, which typically are associated with negative consequences of alcohol consumption (e.g., hangover or withdrawal symptoms).

Memories associated with these rewarding and aversive

qualities of alcohol, as well as learned associations between these internal states and related environmental stimuli or contexts; influence both the initiation and regulation of intake. These experiential factors, together with biological and environmental influences and social forces, are central to the formation of expectations about the consequences of alcohol use. These expectations, in turn, shape an individual's decision about engaging in drinking behavior.

The nature and extent to which these factors are operable in influencing decisions about drinking not only vary from one individual to another but also depend on the stage of addiction—that is, whether the drinker is at the stage of initial experience with alcohol, early problem drinking, or later excessive consumption associated with dependence. Although many people abuse alcohol without meeting the criteria for alcohol dependence, one continued excessive alcohol consumption can lead to the development of dependence. Neuroadaptive changes that result from continued alcohol use and abuse (which manifest as tolerance and physiological dependence) are thought to be crucial in the transition from controlled alcohol use to more frequent and excessive, uncontrollable drinking (Koob & Le Moal 2008). Indeed, for some dependent individuals, the fear that withdrawal symptoms might emerge if they attempt to stop or significantly curtail drinking may prominently contribute to the perpetuation of alcohol use and abuse.

Depression and Alcohol Dependence

When glancing at the symptoms of depression and alcoholism, the connection is not immediately apparent. They certainly seem like two different conditions, and they are. Someone who is depressed might turn to alcohol to feel better. And someone struggling with a dependence on alcohol could clearly become depressed as a result. Research conducted in recent years has confirmed that the

two illnesses are indeed related. Both major depression and alcohol dependence carry a significant risk for the development of the other. Severity in one disorder is associated with severity in the other (Kessler, 1997; Regier, Farmer, Rae et al. 1990; Gilman & Abraham 200; Grant & Harford 1995). Moreover, alcohol dependence prolongs the course of depression, and persistent depression during abstinence from alcohol is a risk factor for relapse to heavy drinking (Hasin, Tsai, Endicott et al., 1996).

Anxiety and Alcohol Dependence

Ipser (2015) found that anxiety disorders (AnxDs) are often combined with alcohol-use disorders (AUDs), worsening the symptoms, and making treatment more difficult. Comorbid AnxDs and AUDs are associated with poorer treatment results and increased difficulties in treatment with standard psychosocial interventions

About 20 percent of people with social anxiety disorder also suffer from alcohol abuse or dependence, and a recent study found that the two disorders have a stronger connection among women. Although alcohol can temporarily reduce symptoms of social anxiety – which is the reason many turn to it – Stein and Walker note that alcohol can also increase anxiety, irritability, or depression a few hours later or the next day. Even moderate amounts of alcohol can affect one's mood and anxiety level.

Stress and Alcohol Dependence

The term “stress” often is used to describe the subjective feeling of pressure or tension. However, when scientists refer to stress, they mean the many objective physiological processes that are initiated in response to a stressor. Because both drinking behavior and an individual's response to stress are determined by multiple genetic and environmental factors studying the link between alcohol consumption and stress may further our understanding of drinking

behavior. Despite the complex interaction between stress and alcohol consumption, it generally is acknowledged that stressful life events prominently influence alcohol drinking and, in particular, relapse (Brady & Sonne 1999; Sinha 2001, 2008)

Stress may be linked to social drinking, and the physiological response to stress is different in actively drinking alcoholics compared with non-alcoholics. Researchers have found that animals preferring alcohol over water have a different physiological response to stress than animals that do not prefer alcohol. Nonetheless, a clear association between stress, drinking behavior, and the development of alcoholism in humans has yet to be established.

There may, however, in the already established alcoholic, be a clearer connection between stress and relapse. Among abstinent alcoholics, personally threatening, severe, and chronic life stressors may lead to alcohol relapse. Brown and colleagues studied a group of men who completed inpatient alcoholism treatment and later experienced. (Ramesh, Jeffrey & Robert, 2010)

Methodology

Descriptive research design was used by the research for this study. Samples selected from alcohol anonymous group (AA) organized by various rehabilitation centers at Idukki district and data collected through questionnaire method. Demographics data sheet prepared by the researcher and ADSS developed by were administered individually

Objectives

- 1) To find out any differences in anxiety, depression and stress on the basis of different age group
- 2) To find out any difference in anxiety, depression, stress on the basis of income, marital status and place of residence of respondents

- 3) To find out any relationship between age, anxiety, depression and stress among alcohol dependent individuals.

Hypothesis

- 1) There is a significant difference between anxiety, depression and stress of respondents categorized on the basis of age.
- 2) There is a significant difference between anxiety, depression and stress of respondents categorised on the basis of monthly income.
- 3) There is a significant difference between anxiety, depression and stress of respondents categorized on the basis of marital status.
- 4) There is a significant difference between anxiety, depression and stress of respondents categorized on the basis of place of residence.
- 5) There is a relationship between age, marital status, monthly income, place of residence.

Results and Discussion

It is found that there is no significant difference between anxiety, depression and stress of dependence categorized on the basis of their age. So the hypothesis rejected and found age is not a factor for developing anxiety, depression and stress. Depression, stress and anxiety are, like many health problems, an equal-opportunity disease. It can afflict anyone, at any age, from childhood to late in life.

Table 1
Mean, standard deviation and corresponding 't' values
obtained by different age groups

Variables	Mean of Age below 40 (N=9)	SD	Mean of Age above 40 (N=26)	SD	't' Values
Anxiety	5.3333	3.57	7.76	5.24	1.287
Depression	4.11	2.61	5.19	4.54	6.72
Stress	4.22	1.64	5.92	4.01	1.773

The result indicated that there is no significant difference in anxiety, depression and stress of respondents categorized on the basis of different age groups.

Table 2
Mean, standard deviation and corresponding 't' values
obtained by married and unmarried persons with alcohol
dependence

Variables	Mean of Married (N=29)	SD	Mean of single (N=6)	SD	't' Values
Anxiety	7.24	5.23	6.66	3.50	2.56
Depression	4.89	4.46	5.00	2.00	0.55
Stress	5.58	3.95	5.00	1.09	3.57

Table 3
Mean, standard deviation and corresponding 't' values
obtained by respondents belonging in urban and rural area.

Variables	Mean of Urban (N=7)	SD	Mean of Rural (N=28)	SD	't' Values
Anxiety	7.42	4.11	7.07	5.19	1.69
Depression	5.28	3.77	4.82	4.26	2.63
Stress	5.28	2.21	5.53	3.92	1.61

Table 4 - ANOVA
Anova of persons with alcohol dependence with respect to monthly income

	Sum of Squares	df	Mean Square	F
Anxiety	Between Groups	3	2.504	.094
	Within Groups	31	26.541	
Total	830.286	34		
Depression	Between Groups	3	7.009	.390
	Within Groups	31	17.991	
Total	557.716	34		
Stress	Between Groups	3	.792	.056
	Within Groups	31	14.270	
Total	442.366	34		
Total	444.743	34		

It proved that their alcoholism is a trigger factor for their behaviour and no other factor associated with this. Kelly (2018) found that depression is not something that is explicitly addressed through AA; however, the program's social fellowship was designed with support of their participants' sense of wellbeing in mind. Just simply abstaining from drinking could improve your mood after several weeks, but attending AA accelerates the progress.

Also proved that there is no significant relationship between age, marital status, monthly income, place of residence of the respondents. It shows that the positive effect of AA group in psychological wellbeing of the alcoholics.

Table 5 - Correlations
Correlation of depression, anxiety, and stress with age

	age	anxiety	Depression	stress
Age	Pearson Correlation	1	.015	-.066
	Sig. (2-tailed)		.932	.707
Anxiety	Pearson Correlation		1	.882**
	Sig. (2-tailed)		.932	.000
Depression	Pearson Correlation			1
	Sig. (2-tailed)		.707	.000
Stress	Pearson Correlation			
	Sig. (2-tailed)		.093	.596
N		35	35	35
		35	35	35

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Crystal Growth and Nonlinear Optical Properties of Guanidinium Carbonate Single Crystals for Optical

Limiting Applications

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Abstract

Guanidinium Carbonate (GC), an organic third order NLO single crystal has been successfully grown in water solution by slow evaporation technique. The crystalline purity of the crystal was measured by powder X-ray diffraction technique. The third order nonlinear optical character of the GC crystal was confirmed through the typical pulsed laser beam Z-scan technique. The optical limiting behavior of the sample leads to the nonlinear refraction.

Keywords: Crystal Growth, PXRD, Z-scan, NLO

1. Introduction

Amino acids are given attention in the field of potential applications including laser technology, telecommunications, optical computing, optical data storage [1, 2]. The crystal structures with non-centrosymmetric space groups have been of interest as materials for optical second harmonic generation (SHG) and third order nonlinear optical properties [3]. The present study deals with crystal growth and third order nonlinear optical properties of guanidinium carbonate crystals.

2. Material and methods

2.1 Crystal growth

The Guanidinium Carbonate salt (98% Merck) was dissolved in double distilled water and stirred well for 8 hours using magnetic stirrer to obtain saturated solution. The saturated solution was filtered using Whatman filterpaper and kept into a beaker and was gently covered with an aluminium foil with a few tiny holes in it for controlled-solvent evaporation. The synthesized salts were purified by repeated recrystallization and finally good transparent colourless single crystals were harvested after 50 days and are shown in Figure. 1.

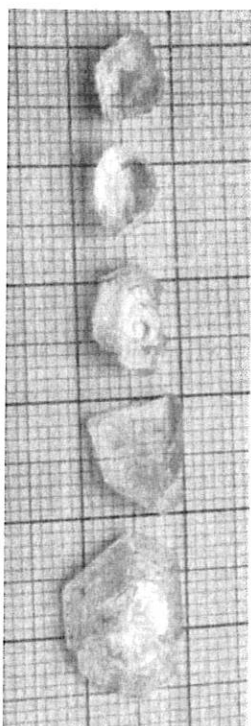


Figure.1: Grown crystals of GC.

3. Results and Discussion

3.1 Powder X-ray Diffraction technique

The reflection planes obtained by the PXRD pattern are indexed using the Powder X software. For visual comparison, the experimental PXRD pattern and the simulated pattern From CIF file [4] are shown in figure.2. The experimental data were found to be close to the simulated data with reasonable accuracy. The well-defined high intensity sharp peaks in the PXRD pattern confirmed that the grown sample is in good crystalline nature.

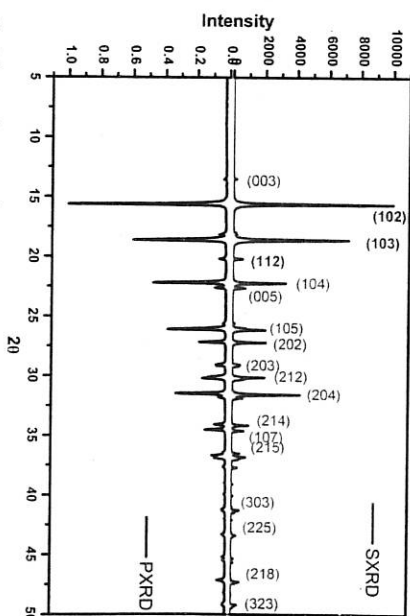


Figure.2: Experimental PXRD pattern of GC crystal and simulated PXRD pattern from SXRD data [4] of GC generated by Mercury 3.0 program.

2.3 Open-Aperture Z-Scan Study

The nonlinear absorption of GC in water solution is measured with the open-aperture Z-scan method using 532 nm excitation wavelength with laser pulses of 5 ns pulse duration obtained from a Q-switched Nd:YAG laser source [5]. The peak irradiance of the input pulsed laser was 100 iJ and the linear transmittance of the sample was 85% at the excitation wavelength. The open aperture Z-scan experimental traces of the sample in ethanol solution are shown in figure.3 (a). The circles in the plots represent the measured data and their theoretically fitted Z-scan curves are the solid curves. The non-linear absorption coefficient \hat{a} can be calculated from the best fit to the normalized open-aperture transmittance T_{norm} of the two-photon absorption process [6]. The minimum transmittance drops to the lower value at the focus during the nonlinear transmission was 58%. The magnitude of the nonlinear absorption coefficient of GC is numerically estimated to be 1×10^{-11} m/W. Because the excitation wavelength was the twice the linear absorption maximum the nonlinear absorption in GC is certainly be attributed to the two-

photon absorption mechanism. The two-photon assisted excited state absorption directing the material to exhibit the reverse saturable absorption property which is responsible for the optical limiting behaviour of the sample under study. The optical limiting curve of GC is shown in Figure.3 (b).

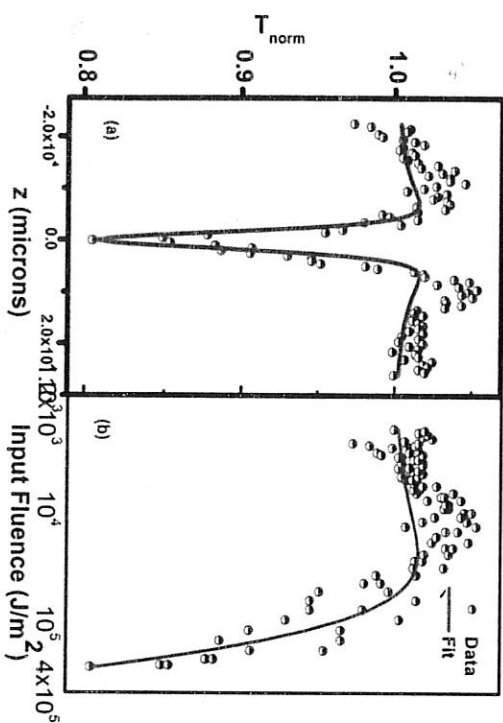


Figure.3: (a) Open-aperture Z-scan curve of GC. (b) Optical limiting curve of GC.

2.4 Conclusion

Good optical quality GC was grown by slow solvent evaporation technique. Powder X-ray diffraction studies confirm the crystal structure and crystallinity of the grown crystals. The open-aperture Z-scan study shows that the 2PA mechanism was responsible for the third-order non-linear absorption characteristics and the samples can be used as optical limiters in ns pulse duration excitation regimes.

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Synthesis and application of Nanoparticles - A Biological Approach

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Nanotechnology is a branch of science which deals with materials at nanoscale with the size of the particles concerned ranges less than 100 nm. "Nanotechnology" concept was introduced by Richard P. Feynman, a Nobel laureate in his famous 1959 lecture "There's Plenty of Room at the Bottom" (Feynman, 1960). This field of science has been experiencing an unprecedented growth since then and contributed immensely in the advancement of science (Laurent *et al.* 2008). These materials can be of various dimensions ranging from 1D, 2D or 3D (Tiwari *et al.*, 2012) owing to their overall shape. Nano particles are structurally made of three layers i.e., a surface layer which can be modified with various functional groups such as surfactants and metal ions etc, a middle shell layer consists of materials which are chemically different from the core and the innermost core region (Shin *et al.* 2016).

Different types of nanoparticles

Nanoparticles are broadly classified based on the physical and chemical characteristics into (1) Carbon-based Nanoparticles (2) Metal Nanoparticles (3) Ceramics Nanoparticles (4)

Semiconductor Nanoparticles (5) Polymeric Nanoparticles and (6) Lipid-based Nanoparticles etc.

Carbon-based nanoparticles are of mainly two types Fullerenes and carbon nanotubes (CNTs) in which Fullerenes are made of globular hollow cage such as allotropic forms of carbon (Astefanei *et al.* 2015) while Carbon nanotubes are elongated tubular structure with a diameter of 1–2 nm (Gupta *et al.* 2018). Metal NPs are composed of metal precursors and possess unique optoelectrical properties owing to their localized surface plasmon resonance (LSPR) characteristics. These nanoparticles are made of alkali and noble metals i.e. Cu, Ag and Au and possess a broad absorption band in the visible region of the electromagnetic solar spectrum. They are found to have immense application in research areas owing to their advanced optical properties (Dreaden *et al.* 2012). Ceramics nanoparticles constitute a group of inorganic nonmetallic solids synthesized by successive heating and cooling and found to have tremendous application in the fields of catalysis, photocatalysis, photodegradation of dyes, and imaging applications (Thomas *et al.* 2015). Semiconductor nanomaterials forms a group which exhibit properties between metals and non-metals and possess wide band gaps by band gap tuning properties which can be significantly altered and are versatile in applications such as photocatalysis and photo optics (Sun *et al.* 2000) and water splitting (Hisatomi *et al.* 2014). Polymeric nanoparticles are organic in nature and exist as spheres which are matrix particles whose overall mass is generally solid and are adsorbed at the outer boundary of the spherical surface. In the latter case the solid mass is encapsulated within the particle completely (Hickey *et al.* 2015). Lipid based nano particles are spherical with diameter ranging from 10 to 1000 nm possess a solid core made of lipid and a matrix contains soluble lipophilic molecules external core is stabilized by surfactants or

emulsifiers (Rawat *et al.* 2011) and has got various applications in drug delivery (Puri *et al.* 2009) and release of nucleic acid such as RNA in cancer therapy (Gujrati *et al.* 2014).

Synthesis of nanoparticles

Nano particles are mainly synthesized by two methods (1) Bottom-up approach and (2) Top-down approach (Makarov *et al.* 2014). In Top-down synthesis a destructive approach is employed in which a larger molecule is decomposed into smaller units and nanoparticles are made from these units. This decomposition is achieved by various methods such as grinding/milling, CVD and physical vapour deposition (PVD) (Korbekandi *et al.* 2015). Bottom-up synthesis, also called building up approach is a method in which nano particles are formed from relatively small substances employing the processes such as sol gel, green synthesis, spinning, and biochemical synthesis (Mogilevsky *et al.* 2014). There is a recent report on the method developed to synthesize LDL NPs employing bottom approach followed by up approach and has been widely using in the drug delivery applications (Needham *et al.* 2016).

Recent advances in nanotechnology led to the development of newer approaches for the synthesis of metal nanoparticles employing "green chemistry", a clean and environmentally friendly protocol which inspired many researchers to think seriously about the possibility of using biological processes (Narayanan and Sakthivel 2010) instead of the conventional physical and chemical methods which are expensive and hazardous to the environment (Gan *et al.* 2012). These methods of nanosynthesis employing green chemistry has proved to be an alternative which is cost effective, environment friendly and safe (Raveendran *et al.* 2003). It is known that a wide variety of biological entities belongs to various groups such as plants and algae (Raveendran *et al.* 2003) diatoms (Scarano and Morelli

2002), bacteria (Lengke *et al.* 2007), yeast (Lengke *et al.* 2007), fungi (Rautaray *et al.* 2003) and human cells (Anshup *et al.* 2005) have the potential to transform inorganic metal ions into metal nanoparticles employing the reducing power of the proteins and metabolites present in these organisms.

Microbes as bioreactors for nanosynthesis

Nanosynthesis employing living organisms is a widely accepted method and it is known that bacteria synthesize both extracellular and intracellular silver nanoparticles when the bacterial cells are allowed to react with silver (I) nitrate (AgNO_3). The prominent bacteria species widely reported to have employed in the generation of silver nano particles are *Pseudomonas stutzeri* AG259; *Escherichia coli*, *Vibrio cholerae*, *Pseudomonas aeruginosa*, *Salmonella typhus*, *Phoma* sp. 3.2883, and *Staphylococcus aureus* (Morones *et al.* 2005). Nucleic acids such as deoxyribonucleic acid (DNA) which is the genetic material and a major component of all living cells known to have the potential for the bioreduction of silver (Feng *et al.* 2000). There are also reports on the active role of sulphur-containing proteins, another significant bio molecule of all living organisms as reducing agents (Morones *et al.* 2005) in nanosynthesis. Fungi belong to various species such as *Verticillium* sp., *Fusarium oxysporum* and *Aspergillus fumigates* are widely used in the synthesis of nanoparticles. *Fusarium oxysporum* utilizes the silver(I) nitrate as the substrate and the reduction of silver is achieved through a nitrate-dependent reductase (Kouassi *et al.* 2005) whereas in other fungi a different mechanism involving carboxylate groups were found to be involved as the reducing agent. It is significant that the nanoparticle production using plants described in the present review displays important advantages over other biological systems. The low cost of cultivation, short production time, safety, and the ability to up

production volumes make plants an attractive platform for nanoparticle synthesis (Njagi *et al.* 2011).

Green synthesis using plants

Plants and the plant derived compounds are the widely explored biological entities for its potential to act as a reducing agent in the synthesis of nanoparticles and these technologies are the need of the time which allays the fears of all environmental concerns (Thuesombat *et al.* 2014). Silver is the widely used nano-material with an estimated production of five hundred tons per year with a wide usage in highly sensitive detection, biosensors and medicine. Silver nano materials are synthesized by various techniques such as ion sputtering, chemical reduction, sol gel, etc. (Bindhu and Umadevi 2015). These conventional methods often pose a threat to the environment owing to the use of hazardous chemicals in the protocol. The versatility in the application of these silver nanoparticles is enormous and is striving towards the cutting edge utilities and it has the potential to revolutionize the field of science and technology including the medical fields. This cutting edge research in the field of nanotechnology cannot be arrested on the basis of its environment hazard owing to the source of generation. Now it is the right time to think of an alternate synthetic route which is not only cost effective but should be environment friendly. Keeping in view of the aesthetic sense, the green synthesis is rendering themselves as key procedure and proving their potential at the top.

Plants are widely used in the mining technology owing to their ability to reduce metal ions and hyperaccumulate metals from soil. It is also reported that this hyperaccumulation of metals would result in the generation of nanoparticles. For example semi-spherical copper particles of 2 nm in size was observed in *Iris pseudacorus* (yellow iris) (Manceau *et al.* 2008) grown on

substrates containing salts of copper. The technology was updated keeping in line with the above observations and led to the introduction of *in vitro* approaches in which various plant extracts were used for the bio-reduction of metal ions to form nanoparticles. These approaches would enable us to optimize the dimension of the nano particle to be synthesized by changing the medium pH and reaction temperature. This method is faster than its synthesis in whole plants since the reaction time is shorter and evades the time required for the uptake and diffusion. This *in vitro* process is being made possible using extracts of various plants in combination acids and salts of metals, such as copper, gold, silver, platinum, iron, and many others (Ghosh *et al.* 2012).

There are reports on the use of various plant extracts derived from *Pelargonium graveolens* (rose geranium) to reduce gold ions into 20–40 nm decahedral icosahedral shaped nanoparticles (Shankar *et al.* 2003) while *Cymbopogon flexuosus* extract was used to synthesize gold nanospheres and nanotriangles 0.05–18 nm size. The plant extract from *Azadirachta indica* (neem, Indian lilac) was used to reduce tetrachloroauric acid (HAuCl₄) to flat gold triangles and hexagons with a size of 50–100 nm (Shankar *et al.* 2004). FTIR spectroscopy studies have shown that the plant metabolites such as terpenoids, sugars, alkaloids, phenolic acids, polyphenols and proteins plays a major role in the reduction of metal ions and imparting stability (Song and Kim 2009). Size and morphology of the nanostructures are connected with the interaction of these biomolecules with metal ions (Shankar *et al.* 2004).

Flavonoids such as anthocyanins, flavonols, chalcones and flavanones, are a polyphenolic compounds which are active chelating agents involved in the reduction of metal ions into nanoparticles. Flavonoids possess various functional groups which are essential for the generation of nanoparticles. It is known that the tautomeric

transformations of flavonoids are found to provide the reactive hydrogen atom needed for the reduction of metal ions to generate nanoparticles. In one of the recent report silver nanoparticles are synthesized using the extract of *Ocimum basilicum* (sweet basil) in which the flavonoids luteolin and rosmarinic acid act as the mediators of bioreduction and gets transformed from enol- to the keto-form (Ahmad *et al.* 2010). It is known that in addition to bioreduction, flavonoids are also involved in the stages of initiation (nucleation) and aggregation. This is because of the property of some flavonoids like quercetin to chelate at multiple sites and lead to adsorption onto a nascent nanoparticle (Kasthuri *et al.* 2009).

Carbohydrates, a major component of plant cell are very good reducing agents owing to the presence of either a keto-group or an aldehyde group. Fructose, a ketose sugar can act as an antioxidant when they undergo a tautomeric transformation to an aldehyde. Moreover, sugars will be active in the open conformation when the functional group is exposed and Sucrose is a non reducing sugar since the functional groups of the components of sucrose, fructose and glucose are involved in the linkage and the open form is not available. Glucose is widely used in the synthesis of metal nanoparticles of various morphologies, whereas fructose has limitations and found to be involved in mediating the synthesis of monodispersed nanoparticles of silver and gold. Glucose is a stronger reducing agent than fructose and the limitation of the antioxidant potential of fructose is due to the limitation in the kinetics imposed by the tautomeric shifts. It is known from the studies that sucrose is able to produce nano particles from metal salts such as tetrachloroauric and tetrachloroplatinic due to acid hydrolysis of sucrose liberates glucose and fructose which have an open chain-form structure (Makarov *et al.* 2014).

Applications of nanoparticles Therapeutic use of nanoparticles

Nanotechnology has become an area with a wide potential in drug industry and the most promising among these are the reports that metallic nanoparticles has antibacterial effect. Antibacterial nanoparticles are the need of the hour owing to the episode of increase in the prevalence of antibiotic resistant strains (Morones *et al.* 2005).

It has been reported that the silver ions has antibacterial effect and it has been tested on two strains of bacteria, namely Gram-negative *Escherichia coli* (*E. coli*) and Gram-positive *Staphylococcus aureus* (*S. aureus*). Toxicity of the ions was visible with the cytoplasmic membrane gets detached from the cell wall and a electron-light region appeared in the centre of the cells indicates condensed deoxyribonucleic acid (DNA) molecules. This is found to interfere with the replication capability of DNA by inactivating the polymerases (Feng *et al.* 2000). This paved the way for the extensive research activities on silver and silver-based compounds, including silver nanoparticles. There are reports on the antibacterial effect of silver nanoparticles of ~1–10 nm in diameter on Gram-negative bacteria as evidenced by high angle annular dark field (HAADF) scanning transmission electron microscopy (STEM) (Morones *et al.* 2005).

Pseudomonas aeruginosa, a gram-negative bacterium is a major causative agent of nosocomial infection which contributes to longer stay at the hospital and mortality. It is a major bacteria responsible for the formation of biofilms in implanted devices such as catheters, lenses, and artificial heart valves and thereby leads to development of chronic infections (Costerton *et al.* 1999) (Radzig *et al.* 2013). One major threat posed by these bacteria is its

resistance to antibiotics owing to its ability to undergo genetic modifications. Silver nanoparticles (AgNPs) with antibacterial property is an alternative to counter drug resistant bacteria and would be an effective potential agent in the years to come which would witness emergence of more drug resistant microbes (Salomoni *et al.* 2017).

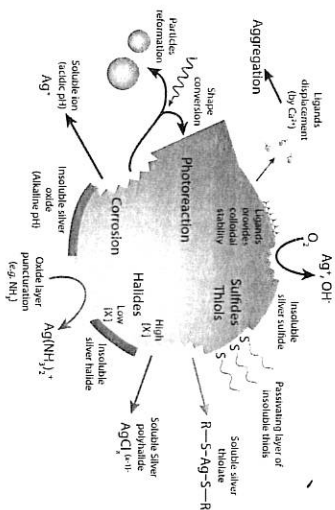


Figure - Silver nanoparticles preparation using various approaches (Guzman *et al.* 2012)

Nanotechnology in environment

Antibacterial activity of the Ag NPs can be employed in disinfection methods and useful in wastewater management (Panacek *et al.* 2006). Nanotechnology exploits the enhanced reactivity of materials at the atomic scale to improve various applications for humankind. In agriculture, potential nanotechnology applications include crop protection and fertilization. However, such benefits could come with risks for the environment: non-target plants, plant-beneficial soil microbes and other life forms could be impacted if nanoparticles (nanomaterials) contaminate the environment. This review evaluates the impact of the major metallic nanoparticles (Ag, ZnO, CuO, CeO₂, TiO₂, and FeO-based nanoparticles) on soil microbes involved in agricultural processes. The current literature

indicate that in addition to population and organismal-scale effects on microbes, other subtle impacts of nanoparticles are seen in the nitrogen cycle, soil enzyme activities, and processes involved in iron metabolism, phytohormone, and antibiotic production. These effects are negative or positive, the outcome being dependent on specific nanoparticles. Collectively, published results suggest that nanotechnology portends considerable, many negative, implications for soil microbes and, thus, agricultural processes that are microbially driven. Nonetheless, the potential of plant and soil microbial processes to mitigate the bioreactivity of nanoparticles also are observed. Whereas the roots of most terrestrial plants are associated with microbes, studies of nanoparticle interactions with plants and microbes are generally conducted separately. The few studies in actual microbe-plant systems found effects of nanoparticles on the functioning of arbuscular mycorrhizal fungi, nitrogen fixation, as well as on the production of microbial siderophores in the plant rhizosphere. It is suggested that a better understanding of the agro-ecological ramifications of nanoparticles would require more in-depth interactive studies in combined plant-microbe-nanoparticle systems

Nanotechnology in regenerative medicine

Nanotechnology has contributed immensely in the field of regenerative medicine which rests on the objective of restoring the normal functions of damage ridden human tissues. Regenerative medicine involves growing tissues and organs in the laboratory (Chun and Webster 2009) employing tissue engineering which is a technology aimed at repairing damaged organs and tissues and replace damaged with the healthy tissues in patients (Bichara *et al.* 2012). Healthy cells are introduced onto various scaffolds made of biomaterial instead of introducing directly into the damaged region and these biomaterials are supposed to have substances to instruct

cells growing over it for growth and differentiation. Various studies indicate the significance of these interactions between cells and scaffolds (Dvir *et al.* 2011), cell-cell and cell-ECM interactions which plays a major role in determining the fate of a cell occur on the nanoscale (Woo *et al.* 2003).

The technology of tissue engineering has grown immensely on receiving the inputs from various fields including nanotechnology with many materials of nanoscale respond to stimuli in spatial parameters (Fleischer and Dvir 2013). It is also reported that the spatiotemporal profile of proteins and polysaccharides which are the key molecules involved in the regulation of cell behaviour can be precisely modulated using nanotechnology. Although cells of organisms falls in the microscale range, the effectors of various cell functions such as adhesion, differentiation and proliferation are much smaller and comes in the nanoscale with the active sites of adhesion molecules, ligand-receptor interactions, cell-cell junctions and cell-ECM binding, are on the order of nanometers (Erickson *et al.* 1981). Even though It has been always a challenge to engineer extracellular matrix proteins and to make it work like the naturally in tissues and organs, it is being made possible with the advances in the arena through nanotexturing, nanopatterning and nanomaterials (Chan *et al.* 2013; Fleischer and Dvir 2013; Ravichandran *et al.* 2013; Stout *et al.* 2012).

Extracellular matrix (ECM) confers integrity to the residing cells and found to regulate a deposition pattern of growth factors (Hynes 2009). ECM contains collagen, a major component and fibrillar protein which makes up the tissue structures falls in the nanoscale diameter and this tissue architecture is found to be disorganized and altered in pathological conditions. Nano engineering employing electrospinning is a remedy to generate synthetic ECM which resembles the normal (Ayres *et al.* 2010).

Conclusion

Nature has graceful and resourceful ways of creating the most efficient miniaturized functional materials. An increasing awareness towards green chemistry and use of green route for synthesis of metal nanoparticles lead a desire to develop environment-friendly techniques. Benefit of synthesis of silver nanoparticles using plant extracts and using microbes as reactor is an economical, energy efficient, cost effective; which provide healthier work places and communities, protecting human health and environment leading to lesser waste and safer products.

As it stands now, majority of commercial nanoparticles have application in medicine and are geared towards drug delivery. In biosciences, nanoparticles are replacing organic dyes in the applications that require high photo-stability as well as high multiplexing capabilities

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Surface Modification of Polymeric Membranes by Layer by Layer Assembly of Polyelectrolytes

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Abstract

Membrane technology plays a significant role in analytical separations over the past decades. They permit regulated passage of particles. By introducing proper functional groups, their efficiency can be further improved in terms of flux and antifouling property which directly affects the separation capacity and the life of the membranes. The layer by layer (LBL) assembly of polyelectrolytes (PEs) is a simple and promising technology for incorporating suitable functional group on polymeric membranes. In this review, various LBL methods of multilayer preparation, mechanism of formation and parameters which affect the properties of surface modified membranes are briefly discussed.

1. Introduction

Membrane treatment processes find applications in various fields such as water purification, gas separations, textile dye effluent treatment, removal of microorganisms, separation of macromolecules, hemodialysis, hemofiltration, plasmapheresis, gas

exchange etc.¹ Depending on the removal mechanisms there are different types of membrane treatment processes. An ideal membrane always possesses high flux and large separation capacity. In some cases, membrane separation or removal requires pre-treatment steps since after some filtrations the separation capacity of the membrane may decline. Another important problem that face during the membrane separations is the fouling that occurs due to deposition of particles on the membrane surface or pores which adversely affects the performance and results in flux decline.² Hence proper cleaning and regeneration is required. In some cases membrane cleaning is a difficult task, mainly in the case of membranes which are fouled due to the build-up of various microorganisms.³ As a result of fouling, the operating expenses also increases. The mechanical stability of the membrane decreases due to fouling and it may degrade the membrane material.^{4,5}

Among the different types of membrane separation processes, high pressure processes such as nanofiltration (NF) and reverse osmosis (RO) are mainly used in water treatment plants and most of the pollutants including divalent and monovalent ions are easily blocked by these systems because of their very small pore sizes. Hence size based separation is possible in these systems and even neutral compounds can be removed. But the less energy consuming processes like microfiltration (MF) and ultrafiltration (UF) systems are not much effective for the removal of these pollutants since they easily slip through the membrane pores because of their large pore sizes. It is very economical if such systems are applicable for the removal of these pollutants. This can be achieved by various surface modification methods which improve both separation efficiency and reduces fouling. By proper surface modifications, the surface functional property can be enhanced and even low pressure

membrane may behave like high pressure systems in terms of its separation capacity.

LbL carry lot of benefits as bottom up controlled assembly. It is an appropriate method with respect to the simplicity of application, substrate versatility and material flexibility.^{6,7} Fabrication of composite membranes by coating skin layers of PEs by this method is an economical and aqueous based cleaner technology.⁸ LbL assembly of PEs involve different types of driving forces which includes electrostatic force,⁹ hydrogen bonding,⁹ hydrophobic,⁶ covalent bonding,⁹ charge transfer,⁶ biological recognition⁶ etc. Due to these various types of interactions the resulting LbL films are stable to extreme conditions.⁶

This review gives the fundamental aspects and present progress in the surface modification of polymeric membranes by LbL method.

2. Fabrication of polyelectrolyte multilayers (PEMs) by LbL assembly

PEM membranes are prepared by the alternate exposure of a charged substrate on oppositely charged PEs followed by washing with water to remove loosely bound ions. By repeating the procedure we can prepare desired number of bilayers depending on the application with required thickness. The main features of the LbL technique for the surface modification of membranes are discussed below.

3. Significance of PEs in surface modification by LbL assembly

Surface coating can be very interesting provided it has molecular level control and potential to upscale at industrial level. Surface modification of membranes by thin polymer films has extensive applications since these skin layers give additional functional

property to the membrane. The use of PEs as the separation layer in composite membranes is an appropriate method to enhance the filtration efficiency of low pressure membranes. PEs are charged macromolecules which are dissociated into positively and negatively charged polymers with counter ions in aqueous medium. Thickness tunability from few angstroms to micrometers by changing different parameters such as the number of layers, type of PE used, processing conditions etc. is yet another property suitable for industrial applications.¹⁰ During LbL assembly, we can easily change the charge of the membrane surface by varying the ending layer with positively or negatively charged PEs.¹¹ Unless in the case of other surface modification methods, the LbL method enhances the water flux by weakening the hydraulic layer increase by controlling the layer thickness.¹² Depending on the nature of the fouling material the rejection property of membrane changes after fouling.¹³ The main factors affecting the membrane fouling are ionic strength, composition, pH and nature of foulants.¹⁴ For a successful membrane separation in terms of cost and energy, membrane cleaning and replacement should be minimal. LbL assembly of PE is a useful method for smoothening the rough surface and thereby reducing the fouling nature of membranes.^{15,16} There are reports for the use of LbL assembly to enhance the antifouling nature of NF and RO membranes.¹⁷ In the case of biofouled membranes, cleaning is very difficult and the disinfection processes like chlorination is not completely effective for the removal of all types of microorganisms.¹⁸ PE multilayers inhibit the formation of biofilms on the membrane surface thereby increases the endurance of membranes.¹⁸

4. Mechanism of PE multilayer formation

Different types of interactions are accountable for the formation of PEMs. There is a gain in entropy during the formation

of multilayers as a result of the release of counter ions. During the formation of PEMs electrical neutrality is preserved either by the opposite charges present in the PEs (intrinsic compensation) or by the counter ions (extrinsic compensation).

Two types of growth mechanisms are involved in the development of multilayers i.e., linear and exponential.¹⁹ In linear growth mechanism, upon each addition of PE there is a linear increase in the thickness of the films as well as the amount of PEs deposited. But in the latter case, an exponential increase was observed for both thickness and the amount deposited. Besides this, other features such as pH, ionic strength and charge density are also accountable for the formation of PEMs.²⁰ If the PEs used for the deposition are held by strong electrostatic attraction, intrinsic compensation occurs with linear increase in thickness resulting in the development of thin layers.¹⁹ But if the PEs are weakly interacted, extrinsic compensation takes place and the amount deposited exponentially increases with thickness. So in the exponential growth mechanism after the deposition of few bilayers, the thickness increases in the micrometer range.¹⁹ In the case of PAH/PSS and PAA/PAH multilayer films, PE pairs show charge overcompensation during each step due to electrostatic interaction and hence linear increase in growth was observed.²¹ But an exponential growth was observed in the case of hyaluronic acid/poly(L-lysine) (HA/PLL) due to the in and out diffusion of PLL during the multilayer formation.²² The ionic strength also affects growth mechanism. For example, poly (diallyldimethylammonium chloride) /poly(styrenesulfonate) (PDADMAC/PSS) showed linear growth at low ionic strength (0.001 M and 0.01 M NaCl) but as the ionic strength increases (0.5 M and 1 M NaCl) an exponential growth was observed.²⁰ In the case of poly(allylamine hydrochloride)/poly(acrylic acid) (PAH/PAA) PEMs at different pH conditions different growth mechanisms

was observed. At pH 7 both the PEs showed almost equal charge density and they behave like strong PEs and hence grow linearly. But at higher and lower pH conditions an exponential growth was observed resulting in the formation of thicker layers due to the difference in charge densities of these PEs.

5. Surface properties of LBL assembled multilayers

The surface properties of the PE multilayer membranes can be easily tuned by changing different parameters.

5.1. Effect of number of bilayers. An important factor which affects the performance of the membrane in various applications is the number of bilayers. In earlier days large numbers of bilayers are used to attain finer separations. Tjike et al used 60 bilayers of poly(vinylsulphate)/poly(vinylamine) for pervaporation studies of ethanol water mixtures.²³⁻²⁴ They also conducted annealing of the bilayers for further improving the ionic cross linking to obtain good separations. But Haack et al used only six bilayers of poly(ethylenimine)/poly(acrylic acid) for the effective separation of ethanol water mixtures with considerable increase in flux.²⁵ The main drawback of using higher number of bilayers is the low flux due to reduction in pores sizes as a result of increase in thickness. So the membranes with lower number of multilayers having high flux and large separation efficiency are now in demand for various applications.

5.2. Effect of salt. Addition of salt to the PE solutions has an important impact on the behaviour of multilayer films especially the thickness, stability and roughness. The strength of the salt solution is a determining factor for the durability and permeation behaviour of PE films.²⁶ Different salt solutions such as NaCl, KCl, MgCl₂, CaCl₂, NaBr, LiCl, AlCl₃, Na₂SO₄ etc. are used for changing the ionic strength of the PE solutions.²⁷⁻²⁸⁻²⁹ In presence of salt there is a

screening of the charge on the polymer by counter ions present in the salt which results in a decrease in the mutual repulsion between similar charges present in the multilayer and thus the films changes from linear to coiled form.³⁰ This causes an increase in thickness of the PEM films. But in the absence of salt the charges present in the polymers are intrinsically compensated. In the presence of NaCl, the thickness of the multilayer films formed from poly(4-styrenesulfonic acid-co-maleic acid, 1 : 1 SS:MA) sodium salt/poly(diallyldimethylammonium chloride) (PSSMA/PDADMAC) increases with increase in ionic strength and found to be smooth as reported earlier. But in presence of NaBr, the thickness was not affected by its ionic strength.²⁷ It was reported that, nanopores are formed on the PAH/PAA multilayer films when the bilayers were both prepared and washed in 0.2 M NaCl solution and kept in pure water.³¹ Harris et al showed the variation in permeation behaviours of ions using PAH/PSS and PAH/PAA films in the presence and absence of salt.³² The permeability of PAH/PSS films with 20 bilayer without the addition of salt was greater than 4 bilayer films with salt in the deposition medium having similar thickness. But for PAH/PAA films, the permeation behaviour increases in presence of salt and found to be even greater than that of the other one. Also above a particular concentration of salt, destabilization of PE multilayer occurs.³³ In a study conducted by Heuvingh et al, the PSS/PAH PE capsules shrink in presence of salt depending on the kind of salt used i.e, the salt with weakly hydrated anions strongly shrinks the capsules.³³ Also in the presence of NaCl at higher concentration (above 3M) annealing occur which results in a softening effect on PE capsule walls.

5.3. Effect of charge density. The charge density of PEs is a determining factor in the multilayer formation. In order to form PE

multilayer a minimum charge density is enough for each PE. The structure and the properties of the multilayer varied with charge density. The thickness of the multilayer increased with decrease in charge density of the PEs.³⁴ Also ionic cross linking reduces with decrease in charge densities which expands the multilayer that makes it capable of separating large molecules.³⁵ The rejection studies of neutral molecules such as glycerol, glucose and sucrose using PE pairs having different charge densities (PSS/PAH, PSS/PDADMAC, PSS/chitosan and HA/chitosan) showed that those with higher charge density showed greater rejection.³⁵ In this case, PSS/PAH showed higher charge density and hence better rejection than HA/chitosan. The charge density of weak PEs (PAA, PAH) can be easily varied by change in pH.¹⁹ In PSS/PAH film, PSS is a strong polyanion and thus completely dissociated at all pH values. But on increasing the pH, the charge density of PAH was found to decrease and it acts as a neutral PE. So the interactions between the PEs decreased which results in swelling.³⁶ This pH responsive change in swelling of microcapsules is applicable for the encapsulation and release of macromolecules.

Other factors such as molecular weight of PEs and temperature are also responsible for the different surface properties of PE multilayer membranes.

6. Preparation methods of PEMs

Compared to other techniques, layer by layer assembly (LbL) is a commonly used bottom-up method with respect to its simplicity, versatility and cost effectiveness. The main LbL techniques are spray coating, spin coating and dip coating. Flow based techniques are also a type of LbL method used rarely.

Spray coating involves the spraying of oppositely charged PEs using air pump under pressure at a constant spray rate on to a

vertical substrate and it takes only a few seconds.³⁷ It is schematically represented as shown in Figure 1c.³⁸ Excess PEs can be removed by spraying the support with water followed by draining.³⁷ It can also be coated on large substrates and hence it is useful in the industrial level.³⁹ Smooth and homogeneous multilayer films are formed by this method and structural properties can be easily varied by varying different parameters.³⁷ Also it can be applied to both 2D and 3D substrates.⁴⁰ But large amount of solution that is used for the preparation is wasted in this technique.

In spin coating method, fast deposition of PEs can be achieved at a spinning speed of 4000 rpm using an automatic spin coater.⁴¹ The schematic representation of spin coating LbL method is displayed in Figure 1b.³⁸ In this technique, PEs are adsorbed on the surface of the substrate by the combined effects of electrostatic forces, shear forces and centrifugal forces.⁴¹ The PE adsorption and rearrangement occurs at a faster rate during this processes resulting in highly ordered and uniform layers with smooth surface without any penetration between each layer.³⁷ The thickness of the films can be tuned by varying the spin rate, angular speed and concentration of the PE solution used.⁴² This method is applicable for the preparation of bilayers on polar substrates having small surface areas.^{37,43} Also it is not useful for 3D substrates.⁴² The properties of the multilayers are largely varied by a small change in the parameters.⁴⁴

Preparation of composite membranes by coating skin layers by dipping LbL method is a low pressure, economical and aqueous based cleaner technology. This surface modification can be achieved by alternative immersion of proper substrate on oppositely charged PEs at room temperature with washing steps in between.⁴⁵ The schematic representation of the dip coating LbL method is shown in

Figure 1a.³⁸ Different number of multilayers can be prepared by repeating the procedure with thickness in the nanometre range. This method is simple and inexpensive since it does not require any specific instrument for fabrication. The main driving force behind the formation of each layers are electrostatic interactions, hydrogen bonding, hydrophobic interactions, covalent bonding, coordination bonding, charge transfer, biological recognition and surface sol-gel process.^{6, 34, 46} The resulting LbL films are stable to severe conditions due to these various types of interactions.⁶ In this process different types of substrates having different size and shapes can be used.⁴⁷ Material flexibility is another important property of this method i.e., not only PEs but also various components such as polypeptides, DNA, certain dyes, porphyrins, proteins, nanoparticles etc. are used for the preparation of LbL assembly.⁹ Dip coating technique is useful for loading of biological species in much higher amounts than in the case of SAMs and forms stable films compared to LB films. But it is a time consuming process compared to the other two techniques. The films formed are not highly ordered compared to LB. It is difficult to prepare multilayer films in large surface areas.¹⁹ But there are automatic dip coating machines available now which makes the dip coating process easier and time saving.

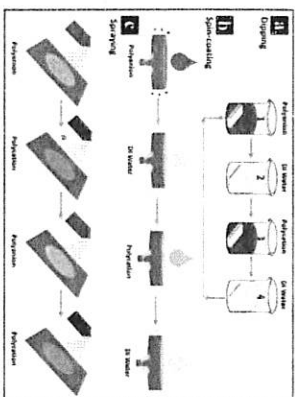


Figure 1. Schematic representation of (a) Dipping LbL assembly (b) Spin-assisted LbL assembly (c) Spray-assisted LbL assembly. By repeating the steps 1 - 4 different numbers of multilayer can be prepared³⁸

In LbL assembly, it is easy to fine tune the membrane thickness by proper selection of materials, number of multilayers, experimental conditions etc. Other surface modification methods for improving the quality of multilayer films include inkjet printing-assisted LbL assembly method, hydrodynamic dip-coating LbL assembly process, atomic layer deposition (ALD), molecular layer deposition (MLD) etc.

5. Summary

This review gives an idea of the LbL assembled surface modification methods adopted for improving the efficiency of the membranes. Using this method, the membrane structure and properties can be easily varied. Thickness of the films can be easily tuned down to the nanometer scale by changing the processing conditions thereby increasing the flux. Also, the LbL assembled PE films shows good antifouling performance by decreasing the surface roughness.

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ടി. പത്മനാഭന്റെ കഥകളിലെ മാനവികത

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കാലഭരണവർ എന്നീ കഥകളെ ആധാരമാക്കിയുള്ള പഠനം.)

ടെജി കെ. തോമസ്

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മനുഷ്യജീവിതവും കഥയും തമ്മിൽ അഭേദ്യമായ ബന്ധമുണ്ട്. കഥ പറയുന്ന മനുഷ്യൻ അവന്റെ ജന്മലക്ഷ്യങ്ങളുടെ വിതാനങ്ങളെ അന്വേഷിക്കുന്നവനാണ്. ജീവിതത്തിന്റെ ഘട്ടങ്ങളെ നിർവ്വചിക്കാനും വെളിപ്പെടുത്താനും മനുഷ്യൻ നടത്തുന്ന ശ്രമഫലങ്ങളാണ് കഥകൾ. ചുരുക്കിപ്പറഞ്ഞാൽ നിർവ്വചനം ആവശ്യപ്പെടുന്ന ജീവിതസന്ധികളെ വെളിപ്പെടുത്താനാഗ്രഹിക്കുന്ന മനുഷ്യന്റെ താരയാണ് കഥകൾ. ഇവിടെ വെളിപ്പെടുന്നത് മനുഷ്യൻ തന്നെയാണ്; അവന്റെ ജീവിതമാണ്. അതുകൊണ്ട് കഥകളിൽ മാനവികതയുടെ ആഴപ്പെട്ട ദർശനങ്ങൾ ഒളിഞ്ഞും തെളിഞ്ഞും പ്രകടമാകുന്നത് തികച്ചും സ്വാഭാവികം മാത്രം.

മാനവികതയുടെ അർത്ഥതലങ്ങൾ

നൂറ്റാണ്ടുകൾക്കുമുമ്പ് മനുഷ്യനെ സിദ്ധാന്തവൽക്കരിച്ച ആശയസംഹിതയാണ് ഹ്യൂമനിസം. മനുഷ്യന്റെ വിചാര വികാരങ്ങളെയും ജീവിതം മുഴുവനെയും മഹത്വവൽക്കരിക്കാൻ ശ്രമിച്ച മാനവികതാവാദം അതിന്റെ ശക്തി പ്രകടിപ്പിച്ചത് സാഹിത്യത്തിലൂടെയാണ്. വിശ്വാസ സംഹിതകളുടെ അടിമത്തത്തിലേക്ക് മനുഷ്യനെ വലിച്ചീഴ്ച്ച മതപരമായ ഹ്യൂമനിസത്തിനെതിരെ സാഹിത്യം പടവാളെടുത്തു. വിക്ടർ ഹ്യൂഗോയും റൂസ്സോയും ദസ്തെയെ വ്സ്കിയും ടോൾസ്റ്റോയിയുമൊക്കെ നേതൃത്വം കൊടുത്ത സാഹിത്യവിപ്ലവങ്ങളിൽ യുക്തിക്കും വിശ്വാസത്തിനും അതീതമായ മാനവികത പ്രത്യക്ഷപ്പെട്ടു. സ്നേഹത്തിനും ദയയ്ക്കും കാര്യേണു ത്തിനും സഹാനുഭൂതിയ്ക്കുമൊക്കെ പ്രാധാന്യം നൽകി മനുഷ്യനെ വ്യാഖ്യാനിക്കാൻ അവർ പരിശ്രമിച്ചു. ഇവിടെ ഹ്യൂമനിസത്തിന്

തികച്ചും ലളിതമായ ഒരു പരിവേഷം ലഭ്യമായി.

സാഹിത്യം നിർവ്വചിക്കുന്നതും വ്യാഖ്യാനിക്കുന്നതും വെളിപ്പെടുത്തുന്നതുമായ മാനവികതയുടെ ഒരു വലിയഭാഗം മലയാള സാഹിത്യത്തിലും പ്രത്യക്ഷപ്പെട്ടു. തകഴിയും കേശവദേവവും പൊറ്റക്കാടും പൊൻകുന്നം വർക്കിയും ബഷീറും ടി. പത്മനാഭനും എം. ടി. വാസുദേവൻ നായരുമൊക്കെ മനുഷ്യനെ നിർവ്വചിക്കുന്നതിൽ മുഖ്യപങ്കു വഹിച്ച കഥാകൃത്തുക്കളാണ്. മനുഷ്യനിലെ സാധാരണതയുടെ നന്മ എടുത്തുകാട്ടി അവനെ തെരുവിൽ നിന്നും ഓടയിൽ നിന്നും തോട്ടിപ്പണിയിൽ നിന്നും ചോറുപുരണ്ട പാടത്തിൽ നിന്നും എടുത്തുയർത്തി മഹത്വപരമാക്കി ഒരു ആത്മസമർപ്പണം മലയാള ഹ്യൂമനിസത്തെ ശ്രേഷ്ഠമാക്കി.

ടി. പത്മനാഭന്റെ കഥകൾ മനുഷ്യബന്ധങ്ങളെ സ്നേഹത്തിൽ വ്യാഖ്യാനിക്കുന്ന ആർദ്രത മുറ്റിനിൽക്കുന്നവയാണ്. മനുഷ്യനന്മയുടെ സങ്കീർത്തനങ്ങൾ അവന്റെ അന്തസ്സിനു കാവൽ നിൽക്കുന്ന ശൈലിയിലാണ് അദ്ദേഹം തന്റെ കഥകളിൽ ആവിഷ്കരിക്കുന്നത്. ചുരുക്കിപ്പറഞ്ഞാൽ മനുഷ്യബന്ധങ്ങളുടെ ഒരു ആത്മീയത പ്രകൃതിയോടും ജന്തുജാലങ്ങളോടും സമൂഹത്തോടും ചേർത്തുകെട്ടി സർവ്വതീയനായും സ്നേഹിക്കാൻ പഠിപ്പിക്കുകയാണ് ടി. പത്മനാഭൻ. മനുഷ്യൻ ജീവിക്കുന്ന ചുറ്റുപാടുകളിലൂടെ സംശുദ്ധമായ മനുഷ്യദർശനസാഹിത്യ വ്യാഖ്യാനിച്ചെടുക്കാനാണ് അദ്ദേഹം ശ്രദ്ധിക്കുന്നത്. മൺസിങ്ങും പ്രകാശം പരത്തുന്ന പെൺകുട്ടിയും ഗൗരിയും അമ്മയും കാലക്കൈവന്മയൊക്കെ ഈ ലക്ഷ്യത്തിൽ മുൻനിരയിൽ നിൽക്കുന്നവരാണ്. ജീവിക്കാനർഹതയില്ലെന്ന് സാഹചര്യങ്ങളും സന്ദർഭങ്ങളും വിധിയെഴുതി തള്ളിക്കളഞ്ഞ മനുഷ്യരെ ആത്മവൽക്കരിച്ച്, സ്നേഹിക്കാൻ ടി. പത്മനാഭൻ തന്റെ കഥകളിൽ ഇടമൊരുക്കുന്നുണ്ട്.

ടി. പത്മനാഭൻ: 'മനുഷ്യനിലെ പ്രകാശം'ത്തെ കണ്ടെത്തിയ കഥാകാരൻ

മലയാള ചെറുകഥാ ലോകത്തിൽ പുതുവഴികൾ തേടിയ കഥാകാരനാണ് ടി. പത്മനാഭൻ. കാവ്യാത്മകവും സാമ്പ്രദായം എന്നാൽ വൈകാരികത നിറഞ്ഞു നിൽക്കുന്നതുമായ സന്ദർഭങ്ങളാണ് കഥയ്ക്കുവേണ്ടി അദ്ദേഹം കൂട്ടിപ്പിടിച്ചത്. ഉള്ള ചുറ്റുപാടുകളെക്കാൾ പ്രതീക്ഷയിലുള്ള ചുറ്റുപാടുകളാണ് ആ രചനാ വൈഭവത്തിന്റെ

ആസ്വാദ്യത. ചെറുകഥകൾക്ക് കൽപ്പിക്കപ്പെട്ടിരിക്കുന്ന ഏകാഗ്രത സൂക്ഷ്മതയോടെ പാലിക്കുന്ന കഥാകാരൻ കൂടിയാണ് ടി. പത്മനാഭൻ.

പ്രകാശം പരത്തുന്ന ഒരു പെൺകുട്ടി എന്ന കഥയിൽ ജീവിതത്തിന്റെ പ്രതീക്ഷകൾ നശിച്ച വ്യക്തിയായി, വിലകുറഞ്ഞതും കീറിയതുമായ കുപ്പായവും ധരിച്ച്, മുടി ചീകാതെ, ഷേവ് ചെയ്യാതെ നടക്കുന്ന മനുഷ്യനെ പുതിയ പ്രകാശത്തിലേക്ക് കൊണ്ടുവരുന്ന പ്രഭേദം തികച്ചും മനുഷ്യമഹത്വീകരണത്തിന്റെ ആവിഷ്കാരം നടത്തുന്നു. തൊട്ടുരുമ്മിപ്പോകുന്ന മനുഷ്യചൈതന്യങ്ങൾ തന്നെയാണ് കെട്ടുപോയ മനുഷ്യവിളക്കുകളെ പ്രകാശമുള്ളതാക്കുന്നത്. ഓരോ മനുഷ്യനും സമൂഹത്തിനു വിലപ്പെട്ടവനാണ്; സമൂഹത്തിന്റെ വേരാണ് എന്ന ബോധ്യം ഈ കഥ പങ്കുവയ്ക്കുന്നു. റാഡിക്കൽ ഹ്യൂമനിസത്തിന്റെ ആവിഷ്കാരപരത പ്രകാശം പരത്തുന്ന ഒരു പെൺകുട്ടി യിലൂടെ സമൂഹത്തിന് ഒരു ആഹ്വാനമാകുന്നു. അനുജത്തിയോടും അനുജനോടുമൊപ്പമെത്തുന്ന ഒരു പെൺകുട്ടി തന്നെ തിരിച്ചറിയുമെന്നും പുതിയ വ്യവഹാരങ്ങളിൽ ഏർപ്പെടുമെന്നും കഥാനായകൻ പ്രതീക്ഷിക്കുന്നു. പക്ഷേ, ഹ്രസ്വമായ ഒരു വ്യവഹാരം മാത്രമെ ഇവിടെ സാധ്യമാകുന്നുള്ളൂ; എന്റെ പ്രതീക്ഷ ശരിയായി, അവൾ എന്നെ നോക്കി. ഭയം കൊണ്ട് ചുളിപ്പോകുന്ന തിനു പകരം ആ കുട്ടി പൂഞ്ചരിച്ചു. അവൾ പേടിച്ചില്ല. എന്തിനാണ് പേടിക്കുന്നത്? സ്വതവേ മനോഹരമായ ആ മുഖം കൂടുതൽ മനോഹരമായിത്തീർന്നു. എന്തുകൊണ്ടോ എന്റെ കണ്ണുകളിൽ വെള്ളം നിറഞ്ഞു. അവൾക്കെന്നെ മനസ്സിലായോ എന്തോ? കണ്ണിൽനിന്നു മറയുന്നതുവരെ ഞാനവളെത്തന്നെ നോക്കി നിന്നു. കാറ്റാടിയുടെ ചിപ്പുകളുടെ ഇടയിലൂടെ ചുളും വിളിക്കുന്ന കാറ്റും കോട്ടയുടെ പാറക്കെട്ടിൽ വന്നടിക്കുന്ന തിരയും ആ പെൺകുട്ടിയുടെ പൊട്ടിച്ചിരി ആവർത്തിക്കുകയാണെന്നെനിധിക്കു തോന്നി. ഇവിടെ നഷ്ടപ്പെടുന്നു എന്നു കരുതിയ ഒരു മനുഷ്യജീവിതം കരുത്താർജ്ജിക്കുന്ന സന്ദർഭങ്ങളെ കഥാകാരൻ മെനഞ്ഞെടുക്കുകയാണ്.

യുദ്ധത്തിന്റെയും ഭീതിയുടെയും മാറ്റിനിർത്തലിന്റെയും നൊമ്പരങ്ങളിൽ സ്വത്വം നഷ്ടപ്പെട്ട മനുഷ്യനെ ഒരു നവോത്ഥാന

ഘട്ടം ഉയർത്തിക്കൊണ്ടുവന്നതിന്റെ ചരിത്രാംശങ്ങൾകൂടി ഹ്യൂമനിസം പഠിപ്പിക്കുന്നുണ്ട്. ഇവിടെ ഈ കഥയും സാമൂഹ്യ ഉത്തരവാദിത്വങ്ങളുടെ ധർമ്മങ്ങൾക്കു മുന്നിൽ ദുർബലനാകുന്ന മനുഷ്യനെ അവന്റെ കരുത്തിലേക്ക്, സ്വതന്ത്രചൈതന്യത്തിലേക്ക് തിരിയെ ക്ഷണിക്കുകയാണ്. കീറി മുഷിഞ്ഞ്, അലങ്കോലമായി, മരണത്തിന് കീഴടങ്ങാനാഗ്രഹിക്കുന്നവനായ കഥാനായകൻ ഇവിടെ ഒരു ബിംബകൽപ്പനയുടെ പ്രതിനിധിയാകുന്നു; വ്യക്തി സ്വാതന്ത്ര്യത്തിന്റെ പൂർണ്ണതയോടെ ജീവിതത്തെ നോക്കിക്കൊണ്ടു നമുഷ്യമാനതാത്തിന്റെ ആവിഷ്കാരമാണ് പ്രകാശം പരത്തുന്ന ഒരു പെൺകുട്ടി പകർത്തുന്ന പുതു ഹ്യൂമനിസം. അത് പ്രതീക്ഷയാണ്, ജീവിതത്തെക്കുറിച്ചുള്ള അഭിമാനമാണ്, ജീവിക്കാനുള്ള മനുഷ്യന്റെ ആഗ്രഹമാണ്. മനുഷ്യൻ അനുഭവിക്കുന്ന സ്വത്വ പ്രതിസന്ധിയുടെ പുറംതോട് തകർത്ത് പ്രകാശത്തിന്റെ സ്വാതന്ത്ര്യമുള്ള ലോകത്ത് മനുഷ്യൻ ജീവിക്കണം എന്ന നിലയ്ക്കാണ് ഈ കഥ ഹ്യൂമനിസത്തിന്റെ അന്തർധാര ഉൾക്കൊള്ളുന്നത്.

51. പത്മനാഭന്റെ കഥകളിൽ അവതരിപ്പിക്കപ്പെടുന്ന ഹ്യൂമനിസത്തിന്റെ വ്യത്യസ്തമാരായാരു തലം ഇവിടെ പ്രകടമാകുന്നുണ്ട്. പാരസ്പര്യത്തിന്റെ വിശുദ്ധബന്ധം നഷ്ടമാകുമ്പോൾ മനുഷ്യനിൽ കടന്നുകൂടുന്ന ദുഷ്ടതയും സ്വാർത്ഥതയും ഒപ്പം നിരാശയുംമൊക്കെ തുറന്നു കാണിക്കുന്ന അനുഭവം ഇവിടെ ആവിഷ്കരിക്കുന്നുണ്ട്. ജീവിതത്തിൽ ഉൽക്കടമായ നിരാശയും ദൈന്യതയും പേറി, ആത്മഹത്യാമുന്നറിയിപ്പ് പിന്നോട്ടെടുത്തുവെച്ച ചുവടുകളിൽ ജീവിതം തെളിഞ്ഞു വരുന്നത് കഥാനായകനിലൂടെ കഥാകാരൻ പഠിപ്പിക്കുന്നു. വിഷാദം നിറഞ്ഞ ജീവിതഘട്ടം പിന്നീട് കഥാനായകൻ വന്നുനിൽക്കുന്ന കടൽത്തീരത്ത് അയാൾ കണ്ടെത്തുന്നത് ബന്ധങ്ങളില്ലാത്ത മനുഷ്യരെയാണ്. കൃത്രിമമായ ആവരണങ്ങളിനിഞ്ഞ് ആഹ്ലാദിക്കാൻ കഴിയാത്തവരായി ഒന്നിനോടും ബന്ധം പുലർത്താതെ ഓരോരുത്തരായി അവർ അങ്ങനെ നടക്കുന്നു. രണ്ടാമതൊരു മാനുഷിക വീക്ഷണം കൂടി ഇവിടെ അവതരിപ്പിക്കുന്നുണ്ട്. ഓർമ്മകൾ ഉണരുന്നു. മുന്പൊരിക്കൽ ഇവിടെ ഹൃദയത്തിലെ മുറിവും പൊത്തിയിരിക്കുമ്പോൾ, മനസ്സിൽ മായാത്ത ഓർമ്മയായി അവശേഷിക്കുന്ന പ്രകാശം പരത്തുന്ന ആ പെൺകുട്ടി പ്രത്യക്ഷപ്പെട്ടു.

ഇവ അവതരിപ്പിക്കുന്നത് മനുഷ്യ ജീവിതത്തിലെ രണ്ട് വശങ്ങളെയാണ്. ഒന്നാമത്തെ കാര്യത്തിൽ, ആരോടും ബന്ധം പുലർത്താതെ കൃത്രിമ ആവരണങ്ങളിഞ്ഞു നടക്കുന്ന വിഷാദം നിഴലിട്ട ജീവിതങ്ങളെയാണ്. എല്ലാത്തരുന്നെടുക്കിയതിന്റെ പ്രത്യേകതകളാണ് ഇവർ അനുഭവിക്കുന്നത്. സ്നേഹത്തിന്റെ മാനുഷികതലം നഷ്ടപ്പെട്ട് ഒറ്റയ്ക്കാകുന്നവരാണ്. ആരോടും ഒന്നും പറയാനും ചെയ്യാനുമില്ലാതെ ആൾക്കൂട്ടത്തിലെ ഒറ്റയാൻമാരായി ഇവർ വാഴുന്നു. മനുഷ്യത്വത്തിലെ പാരസ്പര്യം രൂപിച്ചറിഞ്ഞ് സ്നേഹം അനുഭവിക്കുമ്പോഴേ ഇവർ യഥാർത്ഥത്തിൽ ജീവിതത്തിന് അർത്ഥം കണ്ടെത്തുകയുള്ളൂ. പാരസ്പര്യത്തിന്റെ സ്നേഹബന്ധം നഷ്ടപ്പെട്ട ഇവർ ഒരുപക്ഷേ ജീവിതത്തെ വെറുക്കുന്നുമുണ്ടാകും. ഈ അവസ്ഥയിലാണ് കഥാനായകൻ അന്ന് കടൽക്കരയിലെത്തിയത്. പക്ഷേ, ഇന്ന് പ്രകാശം പ്രതീക്ഷയായ് പകർത്തപ്പെട്ട സ്നേഹബന്ധത്തിന്റെ ഊഷ്മളത ഇവൻ അറിയുന്നുണ്ട്. അതുകൊണ്ട് ജീവിതത്തെ സ്നേഹിച്ച് ജീവനെ സംരക്ഷിച്ച് ഈ മനുഷ്യൻ യാത്ര തുടരുന്നു.

മെൻസിങ്ങിന്റെ മരണത്തിൽ തെളിയുന്ന മാനവികതാദർശനങ്ങൾ

കലാപം വിതച്ച വിനാശങ്ങളുടെ പശ്ചാത്തലത്തിൽ നടക്കുന്ന ഒരു ബസ് യാത്രയും അനുബന്ധ സംഭവങ്ങളുമാണ് മെൻസിങ്ങിന്റെ മരണം എന്ന കഥയിൽ ഉൾക്കൊള്ളിച്ചിരിക്കുന്നത്. മനുഷ്യന്റെ ജീവിതംകൊണ്ട് നിർവ്വഹിക്കപ്പെടേണ്ട ഏറ്റവും വലിയ കാര്യത്തിന്റെ പാഠങ്ങളിലൂടെയാണ് മെൻസിങ്ങ് യാത്ര ചെയ്യുന്നത്. വെറുതെ കഥപറഞ്ഞ് അനുവാചകനെ രസിപ്പിക്കുന്നതിനെക്കാൾ കഥാപാത്രങ്ങളിലൂടെ നടത്തുന്ന മനോവിശകലനത്തിലാണ് 51. പത്മനാഭന്റെ മെൻസിങ്ങിന്റെ മരണം എന്ന കഥ പുരോഗമിക്കുന്നത്. വർഗീയ കലാപത്തിൽ നഷ്ടങ്ങൾ ഏറെ ഏറ്റെടുത്ത മെൻസിങ്ങ് എന്ന കഥാപാത്രത്തിന്റെ മാനസിക ഭാവങ്ങൾ ശക്തമായ തോതിൽ ഈ കഥ പ്രകടമാക്കുന്നുണ്ട്. താൻ അനുഭവിച്ച ദൈന്യതയുടെ ഓർമ്മകൾ അദ്ദേഹത്തിന്റെ ആത്മാവിൽ വേദന നിയ്ക്കുന്ന മുറിവുകളാണ്. എല്ലാം നഷ്ടപ്പെട്ട് എല്ലാവരും നഷ്ടപ്പെട്ട് ഒറ്റയാക്കപ്പെട്ടവന്റെ വേദന പേറുന്ന ഒരു കഥാപാത്രമാണ്

മെൻസിങ്ങ്. യഥാർത്ഥത്തിൽ മെൻസിങ്ങ് എന്ന വ്യക്തിത്വം മാനവികതയുടെ ഉദാത്തത പ്രകടിപ്പിക്കുന്ന കഥാപാത്രമാണ്. മനോവിശകലനത്തിന്റെ പരിസരങ്ങളും സദർഭങ്ങളും ടി. പത്മനാഭൻ ഈ കഥയിൽ പ്രയോഗിച്ചിട്ടുണ്ട്. അതിനാൽ ഒരു മന:ശാസ്ത്രത്തിന്റെ വീക്ഷണത്തിലൂടെയുള്ള ഹ്യൂമനിസത്തെ ഈ കഥയിൽ കണ്ടെത്താൻ കഴിയും.

മെൻസിങ്ങ് എന്ന കഥാപാത്രത്തിന്റെ വിശദമായ പഠനത്തിൽ തെളിയുന്ന ഏറ്റവും പ്രാധാന്യം നിറഞ്ഞ വസ്തുത മാനവികതയുടെ ഏകീകരണഭാവമാണ്. ഓർമ്മകളുടെ നീറിപ്പിക്കുന്ന അനുഭവങ്ങളിലൂടെയാണ് മെൻസിങ്ങ് ഈ ചൈതന്യത്തിലേക്ക് ഉയരുന്നത്. പത്താൻകോട്ടിൽനിന്ന് ബസ്സിൽ കയറിയ ഒരു വ്യഭയം യുവതിയും മെൻസിങ്ങ്ന്റെ മനസ്സിനെ ഇളക്കിമറിച്ചു. അവർ ശ്രീനഗറിലേക്ക് പോവുകയാണ്. പക്ഷേ ജമ്മുവരെയുള്ള ടിക്കറ്റേ അവർ എടുത്തിട്ടുള്ളു. അതിനുള്ള പണമേ അവരുടെ കൈയിലുള്ളൂ. ആ വ്യഭയുടെ മകൻ, യുവതിയുടെ ഭർത്താവ്, ശ്രീനഗറിൽ രോഗിയായിക്കിടക്കുന്നു. ജമ്മുവിൽ നിന്ന് ബസ് പുറപ്പെടുമ്പോൾ അവർ ബസ്സിൽ കയറിയിരുന്നില്ല. ടിക്കറ്റില്ലാതിരുന്ന അവർ ശ്രീനഗർ ലക്ഷ്യമാക്കി നടന്നു. മഞ്ഞറയുന്ന പാതയിലൂടെ നടക്കാമെന്നും ലക്ഷ്യത്തിലെത്താമെന്നുമുള്ള അവരുടെ നിസ്സഹായാവസ്ഥ സൃഷ്ടിച്ച ആത്മവീര്യം മെൻസിങ്ങ് എന്ന മനുഷ്യൻ തൊട്ടറിയുന്നുണ്ട്. ഇവിടെയാണ് മെൻസിങ്ങ് എന്ന വ്യക്തി ഇല്ലാതായി മാറവികതയുടെ ഏകീകരണത്തിലേക്ക് അയാൾ വളരുന്നത്. ഈ മാനവിക ഏകീകരണം അദ്ദേഹത്തിന്റെ മരണത്തോടെ അതിന്റെ ഉച്ചകോടിയിലെത്തുന്നു.

മെൻസിങ്ങ്ലെ മനുഷ്യൻ

മനുഷ്യത്വത്തിന്റെ മുഖമാണ് മെൻസിങ്ങ്. ഈ മനുഷ്യമുഖത്തിന് ചില പ്രത്യേകതകൾ ഉണ്ട്. ആത്മസംഘർഷത്തിന്റെ ഒരു നെരിപ്പോട് നെഞ്ചിൽ ചുമക്കുന്ന ഈ സിദ്ധികാരൻ പരിഷ്കൃത സമൂഹത്തിന്റെ നീതിന്യായ വ്യവസ്ഥകളെ നിരാകരിക്കുന്നവനാണ്. വ്യഭയായ സ്ത്രീക്കും യുവതിക്കും വേണ്ടി ആകോശത്തിന്റെ മുറവിളിതന്നെ നടത്തുന്ന മെൻസിങ്ങ് നിയമത്തിൽ പ്രകടമാകേണ്ട

നന്മയുടെയും സഹാനുഭൂതിയുടെയും മനുഷ്യമുഖത്തെയാണ് വെളിപ്പെടുത്തുന്നത്. മനസ്സുകൾ തമ്മിലുള്ള ആർദ്രമായ ആശയ വിനിമയങ്ങളാണ് ഇത്രയും പ്രതിസന്ധികളെ ഏറ്റെടുക്കാൻ മെൻസിങ്ങ്നെ പ്രചോദിപ്പിക്കുന്നത്. പഞ്ചാബിന്റെ മണ്ണിനെ സ്നേഹിക്കുന്ന ഈ സിദ്ധികാരന്റെ ജീവിതത്തിലെ നഷ്ടബന്ധങ്ങളുടെ കണ്ണിലൂടെയാണ് വ്യഭയുടെയും യുവതിയുടെയും വിഷമസന്ധി അദ്ദേഹം തിരിച്ചറിയുന്നത്. മനുഷ്യമനസ്സിന്റെ ആർദ്രമായ ആശയവിനിമയ സാധ്യതയാണ് മെൻസിങ്ങ്നെ യഥാർത്ഥമനുഷ്യനാക്കുന്നത്. വേദനയുടെ നീർക്കയങ്ങളിൽ നഷ്ടഭുഖങ്ങളോടെ ഏകനായി സഞ്ചരിക്കുമ്പോഴും തന്നിൽ നിന്നു വിടർന്ന് അന്യജീവിതത്തിലേക്ക് പടർന്നുകയറാൻ മാത്രം മാനുഷികഭാവങ്ങൾ അനുവാചകനിലെത്തിക്കാൻ മെൻസിങ്ങ്നിലൂടെ ടി. പത്മനാഭൻ കഴിഞ്ഞിട്ടുണ്ട്.

മെൻസിങ്ങ് പഠിപ്പിക്കുന്ന മാനവികത ത്യാഗത്തിന്റേതാണ്. സഹാനുഭൂതിയുടെ ഉയരങ്ങളിലേക്കാണ് ആ യാത്ര. വാഹനത്തിലിരിക്കുന്നവരെയും ഈ യാത്രയ്ക്കാണ് ഈ കഥാപാത്രം ക്ഷണിക്കുന്നത്. മനുഷ്യനിലെ മഹത്വത്തെ തിരിച്ചറിയുന്ന യാത്രകൾ നടത്തുന്നവരൊക്കെ എന്നൊരു ആഹ്വാനമാണ് ഈ കഥയിലുള്ളത്.

കാലഭരവനിലെ ഹ്യൂമനിസം

കളവു പറയുന്നതു കേട്ടപ്പോൾ സഹിക്കാൻ കഴിയാതെ ബ്രഹ്മാവിന്റെ ശിരസ്സുത്തെടുത്ത കാലഭരവൻ. പിന്നീട് ചെയ്ത തെറ്റിനെക്കുറിച്ച് ബോധവാനായപ്പോൾ പശ്ചാത്താപ വിവശനായി അറുത്തെടുത്ത തലയുമായി ലോകം മുഴുവൻ സഞ്ചരിച്ച് തെറ്റിനെയും ശരിയേയുംകുറിച്ച് ദീർഘകാലം മനനം ചെയ്ത കാലഭരവൻ. ഈ കാലഭരവന്റെ മനസ്സിനെ മനുഷ്യനിൽ തുണിച്ചേർക്കുന്ന കഥയാണ് കാലഭരവൻ. പാപബോധത്തിന്റെ വ്യംപനവും പരിണിതഫലങ്ങളും വരച്ചുവയ്ക്കുന്ന ഈ കഥ യഥാർത്ഥത്തിൽ മനുഷ്യന്റെ വ്യസനങ്ങൾ ചിത്രീകരിക്കുന്നതാണ്. മനുഷ്യനെന്നോക്കി പാപം മാറവഹൃദയം എന്ന് അഭിസംബോധന ചെയ്യാൻ സുഗതകുമാരിയെ പ്രേരിപ്പിച്ച അതേ മാനസികഭാവങ്ങൾ തന്നെയാണ് ടി. പത്മനാഭൻ കാലഭരവനിലെ അയാളിലും സൃഷ്ടിക്കുന്നത്.

മനുഷ്യൻ സ്വയം എത്തിച്ചേരേണ്ട കാശി

കാലഭരൈവൻ കാശിയിൽ വച്ചാണത്രെ തന്റെ പാപകർമ്മത്തിന്റെ ഫലത്തിൽനിന്ന് മോചനം കിട്ടിയത്. അതുകൊണ്ട് ഇവിടെ ഇപ്പോഴും ആളുകൾ വരുന്നു, തങ്ങളുടെ പാപങ്ങൾ കഴുകിക്കളയാൻ. കാലഭരൈവൻ അതു സാധിച്ചുവെന്നു കരുതി നമുക്ക് സാധിക്കണമെന്നില്ല. ഓരോരുത്തനും തങ്ങളുടെ കാശി കൾ കണ്ടെത്തണം: ആത്മവിശുദ്ധിയുടെ കാശികൾ. വീണുപോയവന്റെ വേദനയാണ് കാലഭരൈവൻ ചിത്രീകരിക്കുന്ന ഹൃദയമനിസത്തിന്റെ കാതൽ. മനുഷ്യർവുമല്ലാത്ത തന്റെ കർമ്മത്തിന്റെ പാപഫലംപേറി ഓടിനടക്കുന്ന അയാളിൽ മാനുഷികതയുടെ അംശങ്ങൾ കോറിയിടപ്പെട്ടിട്ടുണ്ട്. അതുകൊണ്ടാവാം അയാൾ ഇങ്ങനെ പ്രതികരിക്കുന്നത്, ഇത് എന്റെ കഥയാണല്ലോ .

പാപബോധങ്ങളുടെ കെട്ടുപാടുകൾ എല്ലാവരെയും എക്കാലത്തും ബാധിച്ചെന്നിരിക്കും. അതിനൊക്കെ ഉത്തരം കാശിക്കുതരാൻ കഴിവില്ല. കാലഭരൈവൻ ലഭിച്ച, അയാളുടെ മനസ്സിലേക്കാണ് സന്ന്യാസി എത്തിനോക്കുന്നത്. അയാളുടെ മനസ്സിലെ കാശിയിലേക്ക് സ്ഥലങ്ങൾ മനുഷ്യാത്മാവിന് നൽകുന്ന പവിത്രതയേക്കാൾ മനോമുകുരത്തിൽ അവൻ തന്റെ പാപകർമ്മത്തിനനുഷ്ഠിക്കുന്ന ത്യാഗങ്ങളാണ് ശ്രേഷ്ഠം എന്ന മാനസിക വിശകലനം തന്റെ ഹൃദയമനിസത്തിന്റെ കാഴ്ചപ്പാടായി ടി. പത്മനാഭൻ കാലഭരൈവനിൽ അവതരിപ്പിക്കുന്നു. ആശ്വാസത്തിനായി അങ്ങിങ്ങ് ഓടിനടക്കാതെ തന്നിൽത്തന്നെ എളുപ്പമേണ്ട തിരുത്തലിലേക്കാണ് ഈ കാഴ്ചപ്പാടുകൾ അനുവാചകനെ ചെന്നെത്തിക്കുന്നത്. മനുഷ്യൻ അവനിൽനിന്ന് ഒളിച്ചോടേണ്ടവനല്ല. മറിച്ച്, പാപബോധങ്ങളുടെ നീർച്ചൂഴിയിൽ നിന്നു കരകയറുന്ന സ്വാതന്ത്ര്യാർത്ഥം തന്റെ ശക്തി സംഭരിച്ച ഒരു മനുഷ്യനാകാനാണ് കാലഭരൈവനിലെ മാനവിക ചിന്താധാര ഉദ്ബോധിപ്പിക്കുന്നത്.

ആ നിമിഷം മുതൽ അയാൾ വെന്തുരുകാൻ തുടങ്ങി. മനസ്സിനെ യേശുക്കോടെ കാണാൻ തുടങ്ങുന്നത് ആ നിമിഷം മുതലാണ്. ആ മനസ്സിൽ നിന്നാണ് തനിക്ക് രക്ഷകിട്ടേണ്ടത്.. തന്റെതന്നെ മനസ്സിന്റെ കുറ്റപ്പെടുത്തലുകളിൽനിന്ന് രക്ഷനേടാൻ വെന്തുന്ന കഥാസായകന്റെ വ്യഗ്രതകളാണിവ. പ്രേമത്തിന്റെ വിശുദ്ധിയിൽ ജീവി

ക്കാൻ ആശ്വഹിച്ച അയാൾക്ക് പ്രേമിച്ചിരുന്ന പെൺകുട്ടിയിൽ നിന്നുണ്ടായ അപ്രതീക്ഷിത ആഘാതം ശക്തമായ പ്രതികരണങ്ങൾ ഉണ്ടാക്കി. പ്രേമത്തിന്റെ ഇടയിൽ അപസ്ഥങ്ങൾക്കു സ്ഥാനമില്ലെന്ന നിലപാടാണ് അദ്ദേഹത്തെ ആ പാപകർമ്മത്തിലേക്കു നയിച്ചത്. നരഹത്യയിൽ കലാശിക്കുമായിരുന്നുവെന്നല്ലാതെ താൻ ഒരിക്കലും നരഹത്യ ചെയ്തിട്ടില്ലെന്നാണ് അദ്ദേഹം ഇതേക്കുറിച്ച് പ്രതികരിച്ചത്. സംഘർഷഭരിതമായ ജീവിതാവസ്ഥകളിൽ മനസ്സിന്റെ ഉയർച്ചതാഴ്ചകളെ അടയാളപ്പെടുത്തുന്നതിൽ ടി. പത്മനാഭൻ വിജയിക്കുന്നുണ്ട്. ഇങ്ങനെ നടക്കുന്ന മാനസികാപഗ്രഥനത്തിലൂടെ മനുഷ്യന്റെ യഥാർത്ഥ ഗുണങ്ങളെയും കഴിവുകളെയും അവന്റെ വൈകാരികതലങ്ങളെയും നിജപ്പെടുത്തി മനസ്സിലാക്കാനും സാധിക്കുന്നു. സന്ന്യാസി പറയുന്ന വാക്കുകൾ മേൽപ്പറഞ്ഞ സന്ദർഭത്തിന് യോജിച്ചതാണ് അശാന്തിയുടെ ബീജങ്ങൾ മുളയ്ക്കുന്നത് മനസ്സിൽത്തന്നെയാണ്. അശാന്തിയുടെ കലുഷിതമായ കാറ്റു വീശുന്നതും മനസ്സിൽത്തന്നെ. തെറ്റുകളുടെ ഭീമാകാരമായ വ്യൂഹത്തിനകത്താണ് താനെന്ന സാദൃശ്യം മനുഷ്യനെ ഒറ്റപ്പെടുത്തുകയും ഒളിച്ചോടാൻ പ്രേരിപ്പിക്കുകയും ചെയ്യും. ഇതും മനസ്സിന്റെ ഒരുതരത്തിലുള്ള ആന്ദോളനമാണ്. ആവേശമവസാനിക്കുമ്പോൾ തെറ്റും ശരിയും തിരിച്ചറിയുന്നതും ഈ മനസ്സുതന്നെ .

സുരക്ഷാസങ്കേതമെന്ന് കരുതുന്ന സ്ഥലങ്ങൾ അരക്ഷിതമെന്നും മനസ്സ് പറയും. സുരക്ഷിതമെന്ന തോന്നൽ ഒരിക്കൽ മനസ്സിൽവന്നാൽ അത് ഓടാൻ പ്രേരിപ്പിച്ചുകൊണ്ടേയിരിക്കും. കാലഭരൈവന്റെ കഥാപ്രമേയത്തിൽ ഈ വസ്തുത കാണപ്പെടുന്നുണ്ട്. കാലഭരൈവന്റെ കഥയിൽ അങ്ങനെ ഒരു കാശിയുണ്ട്. എന്നാൽ ഇവിടെ ഇത് മനസ്സെന്ന കാശിയാണ്. ഓടിയൊളിക്കാൻ ആശ്വഹിക്കുന്ന മനസ്സിൽത്തന്നെ ഓരോരുത്തനും തിരിച്ചെത്തണം. അവിടെയാണ് പരിഹാരകർമ്മങ്ങൾ അനുഷ്ഠിക്കപ്പെടേണ്ടത്. അതുകൊണ്ട് കഥ അവസാനിക്കുന്നത് ഇങ്ങനെയാണ് എങ്ങോട്ടോ പോയ സന്ന്യാസിയുടെ കൂടെയല്ല അയാൾ പോകുന്നത്. അവിടെ നിന്നും പോയി. പക്ഷേ, അതു കാശിയിലേക്കല്ല, മറിച്ച്, അയാൾ തന്റെ മനസ്സിന്റെ കാശിയിലേക്ക് പോയി.

മാനവികതയിലൂന്നിയ ദർശനസമഗ്രത

ടി. പത്മനാഭൻ തന്റെ കഥകളിലൂടെ അനുവാചകർക്ക് പരിചയപ്പെടുത്തിയ ഹ്യൂമനിസത്തിന് ഒരു നവീനതലം ഉണ്ട്. മനുഷ്യർ തമ്മിലുള്ള ബന്ധങ്ങളെപ്പോലെതന്നെ മനുഷ്യനും പരിസരങ്ങളും പ്രകൃതിയും തമ്മിലുള്ള പാരസ്പര്യത്തിന് പത്മനാഭൻ വിലകൽപ്പിക്കുന്നുണ്ട്. പ്രകാശം പരത്തുന്ന പെൺകുട്ടിയിലെ കഥാനായകൻ കഥ പറഞ്ഞു തുടങ്ങുന്നത് വരിവരിയായിനിൽക്കുന്ന കാറ്റാടിമരങ്ങളിലൊന്നിന്റെ ചുവട്ടിൽ നിന്നാണ്. സന്ധ്യയും മരച്ചുവടും ഇരുട്ടുമൊക്കെ മനുഷ്യനോട് സംവദിക്കുന്ന പാരസ്പര്യം പത്മനാഭൻ ഇവിടെ ആവിഷ്കരിക്കുന്നു. സൂര്യപ്രകാശവും പനിനീർപ്പൂക്കളുമുള്ള ലോകത്തെയും പാറക്കെട്ടിലിട്ട് ചിന്നിച്ചിതുന്ന കാട്ടുചോലയുമൊക്കെ അദ്ദേഹം തന്റെ കഥയുടെ മാനവികതയോട് ചേർത്തുവയ്ക്കുന്നു. ഹ്യൂമനിസത്തിന്റെ നവീനതലങ്ങൾ ശബ്ദ ട്രിയിലും ചെരുപ്പിലും പൂച്ചക്കുട്ടികളുടെ വീട്ടിലും മഞ്ഞ നിറമുള്ള റോസാപ്പൂവിലും ചേർത്തുകെട്ടാൻ നടത്തുന്ന ശ്രമം കഥാകാരന്റെ നവ ഭാവുകതാ സൃഷ്ടിയാണ്.

മനുഷ്യന്റെ മഹത്വം ജീവിതം കൊണ്ട് തിരുച്ചറിയപ്പെടേണ്ടതാണെന്ന ആഹ്വാനം ടി.പത്മനാഭൻ മുന്നോട്ടു വയ്ക്കുന്നുണ്ട്. പ്രകാശം പരത്തുന്ന പെൺകുട്ടിയിലെ നായകനോടും കാലഭൈരവനിലെ പ്രധാന കഥാപാത്രത്തോടും ജീവിക്കാനാണ് കഥാകാരൻ ആവശ്യപ്പെടുന്നത്. മരണത്തിന്റെ ആശ്വാസമെന്ന തെറ്റായ ധാരണ അവരുടെ സിരാപടലങ്ങളിൽ പടർന്നു കയറുമ്പോൾ തിരിച്ചറിവിന്റെ ഒരു നിമിഷാർദ്ധസമയം ജീവിക്കാനുള്ള പ്രേരണയായി വച്ചുനീട്ടാൻ കഥാകാരൻ താത്പര്യം കാണിക്കുന്നു.

മനുഷ്യന്റെ സ്വാതന്ത്ര്യത്തെക്കുറിച്ചുള്ള വ്യാഖ്യാനങ്ങളും ടി.പത്മനാഭന്റെ കഥകളിലുണ്ട്. ആത്മഹത്യ ഒരു സ്വാതന്ത്ര്യമാണെന്ന ചിന്തയെ മറികടന്ന് നന്മയുടെ ജീവിതമാണ് യഥാർത്ഥ സ്വാതന്ത്ര്യം എന്നു പറിപ്പിക്കുന്ന ഒരു ശക്തനായ ഹ്യൂമനിസ്റ്റിനെ ഇവിടെ ദർശിക്കാനാവും. സ്വജീവിതത്തിലും അന്യജീവിതത്തിലും നന്മയെ സ്വീകരിക്കുന്നവരും കൊടുക്കുന്നവരുമായിത്തീരാൻ ടി. പത്മനാഭന്റെ കഥകൾ ഉദ്ബോധിപ്പിക്കുന്നു. തന്നോടും സഹജീവികളോടും പ്രകൃതിയോടും ചേർന്നു നില്ക്കുന്ന മാനുഷികതയാണ് യഥാർത്ഥസവാതന്ത്ര്യത്തിലേക്കു മനുഷ്യനെ നയിക്കുന്നത്. ഈ ദർശന സമഗ്രതയാണ് ടി. പത്മനാഭന്റെ കഥകളിൽ കാണാൻ കഴിയുന്നത്.

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