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3.4.3 Number of research papers published per teacher in the Journals as notified on UGC CARE list during the last five years

NUMBER OF RESEARCH PAPERS PUBLISHED (2022-2023)

3.4.3 Number of research papers published per teacher in 2022-2023

S.No	Title of paper	Name of the author/s	Department of the teacher	Name of journal
1	Dalit movement: A Social change	B.N. Prathyusha	English	Bhava veena (UGC Care Journal)
2	Telugu kavitvamlo rekkala prasthanam	P. Nagamallika	Telugu	Auchithyam volume 3
3	Sahitya shilpi baapiraju	P. Nagamallika	Telugu	Amma nudi
4	Sense of love towards nature and children in the short stories of Ruskin Bond	B.N. Prathyusha	English	INT-JECSE International Journal of Early child hood special education (UGC Care Journal)
5	Do ESG had influence on Return on Investments of BRICS listed Stock Exchanges:An Empirical Study	Rama Durga Sirisha Reddy	Commerce	Social Science Journal
6	Depiction of children in Ruskin Bond's Short stories	B.N. Prathyusha	English	INT-JECSE International Journal of Early child hood special education (UGC Care Journal)
7	The role of ICT in English language teaching	B.N. Prathyusha	English	Lang-Lit International Journal (UGC Care Journal)
8	Spectral studies of Nd3+ doped different fluorophosphate glasses for their aptness in laser applications at 1060 nm	B. Surya narayana Devara	Physics	Physics and Chemistry of Glasses - European Journal of Glass Science and Technology
9	Study on Gender Difference in Suicidal Ideation among Adolescents	M. Suvarchala	Home Science	International Journal of Management (IJM)
10	Delving into the spectroscopic properties of dy3+in different fluorophosphate glasses for multitude of applications	B. Surya narayana Devara	Physics	International Journal of Current Advanced Research
11	The Effects of Prebiotics & Probiotics on Anxiety Depression & Suicidal ideation with Special Refercence to Adolescents A Review	M. Suvarchala	Home Science	Journal of fundamental and compartive Research
12	Potanabhagavata sambhashanulu Advaitam, Taditara ciddhanthalu	K. Madhavi	Telugu	Auchithyam

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Dalit Movement : A Social Change

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Abstract :

Dalit movement is an organized collective action of groups or lowers caste people against the upper-class people and their thought process on Brahamical thoughts to maintain an aura of empowerment and equality in the Indian society. Dalit Movement has no doubt brought a major social change in the traditional hierarchy of Indian society. It has encouraged the democratic ideals of liberty, equality and social justice among the different castes and classes of people. The Dalit movements raised the issues related to identity and reservations of government jobs and political positions. There was a strong opposition to the practice of untouchability and discrimination. The movements have brought the dalits to the mainstream politics and allowed them to hold important and administrative posts in different parts of the country. The dalit literature mobilized the dalit intellectuals to assert their rights and maintain their dignity in the hierarchical society. The Dalit movement was a direct challenge to the upper caste and class and they have been acting as a strong pressure group to the government in the mainstream politics. Thus the dalit movement has become a powerful social movement to bring a major socio-economic and political transformation in the conditions of dalits.

Keywords : empowerment, identity, hierarchy, transformation, intellectuals

Introduction :

An ideal society should be mobile, should be full of channels for conveying a change taking place in one part to other parts. In an ideal society there should be many interests consciously communicated and shared. There should be varied and free points of contact with other modes of association. In other words there should be social endosmosis. This is fraternity, which is only another name for democracy. Democracy is not merely a form of Government. It is primarily a mode of associated living, of conjoint communicated experience. It is essentially an attitude of respect and reverence towards fellowmen.....

- Dr. B.R.AMBEDKAR

The Dalit movement began as a protest movement to bring socio-political transformation in the status of dalits in India. Dalits have been ruthlessly exploited and inhumanly subjugated by the upper castes for centuries. They have been isolated, fragmented and oppressed by the hegemony of Brahmin culture. The new polity, the postmodern administrative framework, the rational judicial system, the current forms of land tenure and taxation, the new patterns of trade, the liberal education system, and the network of communications emphasized the spirit of liberty, equality and social justice for Dalits.

The Dalit movement asserts rights and privileges to the Dalits. Ruman Sutradhar (2014) writes that the Dalit Movement is a social revolution aimed for social change, replacing the age old Dalit Movements in India hierarchical Indian society, and is based on the democratic ideals of liberty, equality and social justice. He

also explains that the socio-cultural exclusion, economic deprivation and political exploitation of centuries made the Dalits break out of such kinds of age-old prejudices. Hence, they began to protest with the help of literature, or forming organizations like the Dalit Panthers, and this protest movement came to be recognized as the Dalit Movement.

The postmodern researchers, social scientists and academia have developed their interest to study the Dalit movement as it is one of the important social movements in India. Different Dalit leaders through their organization and political parties have mobilized and motivated the Dalit mass to achieve the overall objectives of creating an inclusive society. Due to stronger mobilization by the Bahujan Samaj Party, the dalits could participate in the democratic electoral process in the country and create a separate identity for themselves. The dalit leaders unleashed the movement for maintaining or increasing reservations in political offices, government jobs and welfare programmes. It is called the new political movements of dalits. Dalit movement brought a transformation in the caste structure of Indian society and emphasized the fight for self-dignity. The present reservation system is the outcome of dalit movement.

Who is a Dalit?

Dalits have different names in different parts of our country. They are called Holaya, Panchama, Chandala, Samagara, Chammar, Adikarnataka, and Adidravida etc. The word% »»%Dalit%µµ %is derived from the Sanskrit word Dal, means%µµ%ground%µµ, »»%suppressed%µµ, »»%crushed%µµ, %or% »»%broken to pieces%µµ. %It was first used by Jyotiba Phule, the founder of the Satya Shodak Samaj, a non-Brahmin movement in Maharashtra. He used the term to refer to the outcastes and untouchables as the victims of the caste-based social division of the Indian society in the nineteenth century. Victor Premasagar writes that the term expresses the Dalits%µ »»%weakness, poverty and humiliation at the hands of the upper castes in the Indian society%.µµ

The term Dalit has become a political identity, similar to the way African Americans in the United States moved away from the use of the term% »»%Negro%µµ, %to the use of% »»%Black%µµ %or% »»%African-American%.µµ %Dalits today use the term% »»%Dalit%µµ %as they believe the term is more than being broken and is in fact an identity born of struggle and assertion. The word dalit is a degraded term which was replaced by the British rulers who named it as depressed class in 1919. Gandhi lovingly called them Harijan. The British administration defined them as Scheduled castes in 1935. Again the term Dalit was popularized by the Dalit Panther Movement of Maharashtra in 1970.

In Varna Vyavastha, untouchables are placed as Panchama Varna. They occupy the lowest position in Indian society. They are the members of the menial caste and they are considered as impure and polluted and they have been regularly facing discrimination and violence which prevents them from enjoying the basic human rights and dignity promised to all citizens of India. They were denied access to roads, temples, schools, etc. to avoid% »»%pollution%µµ %of other castes. They are forced to accept polluting occupations like dis-

posing dead bodies, working with leather, cleaning toilets and sewage, etc.

The total percentage of Dalits is 16.6 percent in India. They are highly concentrated in states like Uttar Pradesh, Punjab, Bihar, West Bengal, Tamil Nadu, Andhra Pradesh, Rajasthan, Orissa and Maharastra. Dalits are mainly poor peasants, share-croppers and agricultural labourers in the rural economy. In the urban economy they basically form the bulk of the labouring population. Sutrdhar (2014) writes that Dalits began their movement against the exploitation by Brahmans, and that they have not succeeded even now. There are varied reasons why the movement could not be successful and one of the most important is that Brahmanism is deep rooted in the social structure of India.

The Arya-Brahmins, the originators of the Vedas have actually institutionalized discrimination through the institution of caste. The majority are accepting caste system because the dominant ideology is inflicted in the people%µ%s minds by the process of hegemony. Brahmanism, in order to continue discrimination has made use of Gramscian hegemony%»%through social institutions like schools, and temples, to maintain their hegemonic status. The Brahmins have very systematically deprived the Dalits of their own land and resources. The dominant Brahmanical ideology of caste is being resisted by a small group that took the shape of the Dalit Movement. A few educated Dalits organized the majority to begin the movement.

Dalit Movement in Pre-Independence India :

Bhakti Movement: This movement in 15th century was a popular movement which treated all sections of society equally and it developed two traditions of Saguna and Nirguna. The first one believed in the form of God Vishnu or Shiv relating to the Vaishnavite or Shaivaite traditions. It advocated equality among all the castes though it subscribed to the Varnashram dharma and the caste social order. The followers of Nirguna believed in formless universal God. Ravidas and Kabir were the major figures of this tradition. It became more popular among the dalits in urban areas in the early 20th century as it provided the possibility of salvation for all. It promised social equality. Through these movements Fuller argues devotionalist ethic came to be widely reinterpreted as a charter of egalitarianism. No doubt the teachings of Bhakti movement inspired and motivated scheduled castes for the beginning of dalit movement. These pro-vided the means to protest against orthodox Hinduism for future generations of Dalits.

Neo-Vedantik Movements: These movements were initiated by Hindu religious and social reformers. These movements attempted to remove untouchability by taking the dalits into the fold of the caste system. According to the pioneers of these movements, untouchability was not an essential part of Hinduism and, for that matter, of the caste system. Dayanand Saraswati, the founder of the Arya Samaj, believed that the caste system was a political institution created by the rulers% »%for the common good of society, and not a natural or religious distinction%µ. %He said%, »%in fact, any Brahman, who is disqualified for his work, becomes at once a Sudra de jure, and a Sudra, who qualifies for it, becomes at once a

Brahmana de jure; though neither can become so de facto also either by his own will or the will of others, as long as the state does not make him so°µ (°Jordens 1978: 62).

The neo-Vedantic movements and non-Brahmin movements played an important catalytic role in developing anti-caste or anti Hinduism dalit movements in some parts of the country. The Satyashodhak Samaj and the self-respect movements in Maharashtra and Tamil Nadu, the Adhi Dharma and Adi Andhra movement in Bengal and Adi-Hindu movement in Uttar Pradesh are important antiuntouchability movements which were launched in the last quarter of the 19th and the early part of 20th century. Nandini Gooptu (1993) in her study in Uttar Pradesh in the early twentieth century briefly analyses the emergence of the Adi-Hindu Movement in the urban areas of the region (2001). Like Adi-Dharma, the leaders of the Adi-Hindu movement believed that the present form of Hinduism was imposed on them by the Aryan invaders. The movement did not pose a direct threat to the caste system. It was% »%in essence, conceived as and remained a protest against the attribution of% »»»%low%µµ %roles and functions to the untouchables by means of a claim not to be Aryan Hindus; it was not developed into a full-blown, direct attack on the caste system%µ (%Gooptu 1993: 298).The Dalits began to call themselves Adi-Andhras in Andhra, Adi- Karnatakas in Karnataka, Adi-Dravidas in Tamil Nadu, Adi-Hindus in Uttar Pradesh and Adi-Dharmis in Punjab. Dalits also followed the route of conversion with a purpose of getting rid of untouchability and to develop their social and financial conditions.

Mahatma Jyotiba Phule formed the Sayta Shodak Mandal in 1873 with the aim of liberating non-Brahmins from the clutches of Brahminism. Shahu Maharaj of Kolhapur started Satya Shodak Mandal in 1912 and carried forward the movement started by Phule. In the pre-independence period, the Dalit movements comprised of a strong non-Brahman movement against Brahmanism in Maharashtra, Adi Dravidas movement in Tamil Nadu, Shri Narayan Dharma Paripalan movement in Kerala, Adi Andhras movement in Coastal Andhra and the like. Phule tried to formulate a new theistic religion.

Ambedkar%µ%s Contribution to Dalit Movement :

Ambedkar started a Marathi fortnightly, the% »»»%Bahiskrit Bharat%µµ, %in April 1927 and a weekly, the% »»»%Janta%µµ %in November 1930. In September 1927 he started the% »»»%Samaj Samta Sang%µµ %for advocating social equality among the untouchables and the caste Hindus. He supported inter-caste dinner and inter-caste marriage. He also published another paper, the% »»»%Samata%µµ %in March 1929. In December 1927 he led a Satyagrah to establish the civic rights of the untouchables to draw water from a public tank%, »%Chavadar Talen%µ, %at Mahad district Kolaba. Hindus claimed the tank as a private property and a prolonged litigation followed. Ambedkar won the case in the Bombay High Court in March 1937.

Ambedkar conducted another Satyagrah in March 1930 to establish the rights of the untouchables to enter the famous temple of Kalaram at Nasik. The Satyagrah was with-

drawn in 1934. From April 1942 to 1946, he spread his activities and formed the Scheduled Castes Federation°µ°as an all India political party. From 1942 to 1946 he was a member of the Governor General°µ°as Executive Council and took advantage of this opportunity to promote the interest of scheduled castes and scheduled tribes. He secured funds from the central Government for their education and reservation in posts in the central and provincial services for them.

Conclusion :

Untouchability has been outlawed, but unfair practices have not. Today, wearing nice clothing is not banned, but getting a decent job is. Today, socially and politically based structures of the society, in the view of reform and social betterment, set up one group against the other, creating hostility and maintaining the sense of disapproval from the past. Education is the only way to overcome such prejudice. Thus, the social reform movement will only succeed if all the Dalits unite and fight for equal rights. However, they must realise that the caste, that is, mostly popped up in people°µ°s minds, can never be eliminated. Therefore, here, the social transformation would tell us that the abolition of discrimination based practices and the attainment of rights are both required for the uprisal of society%µ%s majorly disadvantaged group, the Dalits. Dr. Ambedkar%µ%s writings are as relevant today as were at the time when these were penned. He firmly believed that our political democracy must stand on the base of social democracy which means a way of life which recognizes liberty, equality and fraternity as the principles of life. He emphasized on measuring the progress of a community by the degree of progress which women have achieved. According to him if we want to maintain democracy not merely in form, but also in fact, we must hold fast to constitutional methods of achieving our social and economic objectives. He advocated that in our political, social and economic life, we must have the principle of one man, one vote and one value.

Reference :

1. Dadawala Darshini.(2016). Dalit Literature Concept, Origin and Features, International Journal of English, Language ,Literature and Humanities, February volume --IV, Issue -- II.
2. G.S.Ghurye. (1969}. Caste and Race in India. Bombay: Popular Prakashan
3. Shah, Ghanshyam (1985) Caste Conflict and Reservations, Centre for Social Sciences, (Surat: Ajanta Publications.
4. Omvedt Gail (1976) Cultural Revolt in a colonial society: The Non-Bramhan movement in Western India,(1873- 1930) Bombay.
5. Sutradhar Ruman. (2014). Dalit Movement in India: In the light of four Dalit literatures, IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 13, Issue 4 Ver. V. (Apr. 2014), PP 91-97

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1. తెలుగు కవిత్వంలో రెక్కుల ప్రస్థానం

డా. పసుపులేటి నాగమల్లిక

తెలుగు శాఖాధిపతి, ప్రభుత్వ డిగ్రీ కళాశాల రామచంద్రపురం,
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సెల్: 7981364632, email: pnmpvs14@gmail.com

ఉపోద్ఘాతం:

ఆధునిక తెలుగు సాహిత్యంలో వచన కవిత కేవలం ప్రక్రియగా మాత్రమే కాకుండా సమాజాన్ని చైతన్యం చేయడానికి, వ్యక్తి సాధికారతకు ఊతమిస్తూ అత్యంత శక్తివంతమైన పాత్ర పోషిస్తోంది.సమాజ పక్షంగా ఆధునిక భావజాలంతో రూపొందించిన వచన కవిత్వం ప్రజాస్వామ్య కవిత్వంగా మన్ననలు అందుకుంటోంది.వస్తు వైవిధ్యాన్ని,రూప నవ్యతను కలిగి కవికి పూర్తి స్వేచ్ఛనిచ్చి సరళత్వం, ఎదలను తాకే సూటితనంతో, సమాజానికి ప్రతిబింబంగా, వాస్తవికతకు నిదర్శనంగా నిలుస్తూ ఎన్నో కొత్త కొత్త ప్రక్రియల రూపకల్పనకు మార్గ దర్శకత్వం వహిస్తూ కొనసాగుతోంది.

ఈ వచన కవితా స్రవంతిలోనే మినీ కవిత్వం, నానీలు, హైకూలు మొదలైనవెన్నో ప్రక్రియలు కొత్త ఒరవడిని సృష్టిస్తూ ప్రజా చైతన్యాన్ని కోరుకుంటూ సమాజాన్ని ముందుకు నడిపించడంలో కవి పాత్రను తెలుపుతున్నాయి. ఇలాంటి నూతన వచన కవితా ప్రక్రియల్లో రెక్కులు ప్రక్రియ ఒకటి.

ప్రక్రియ రూపకర్త:

రెక్కులు రూపకర్త ఆ నాటి పైగంబర కవి అయిన ఎం.కె. సుగమ్ బాబు. ఇందులో అల్పాక్షరాల్లో అనల్పార్థాన్నిచ్చే భావం ఇమిడి ఉంటుంది. ఈ ప్రక్రియలో ప్రాకృతిక, తాత్విక, వాస్తవిక, సామాజిక విషయాలు ప్రధానాంశంగా ఉంటాయి. రెక్కులు ప్రక్రియ రెండు భాగాలతో కూడిన రూపం. మొదటి నాలుగు లైన్లు పక్షి శరీరమైతే చివరి రెండు లైన్లు రెండు రెక్కలు. మొదటి భాగం ఒక సాధారణమైన స్టేట్మెంట్ అయితే దానికి తాత్విక వ్యాఖ్యానంగా ఉంటుంది. రెండో భాగం రెక్కులు దీన్ని సాధించే శిల్పం. సాధారణమైన స్టేట్మెంట్లో ఉండే ఒక అతి సాధారణమైన భావాన్ని ఉదాత్తపరిచి అసాధారణ పరిధిలోనికి తీసుకువెళ్లేవే రెక్కులు. దీనిలో జీవన సత్యాలు, తాత్విక భావాలు చోటు చేసుకుంటాయి. తెలిసిన విషయాల నుండి తెలియని విషయంలోకి రెక్క పట్టి నడిపించడమే రెక్కులు ప్రత్యేకతగా కనిపిస్తుంది.

రెక్కులు - లక్షణాలు:

ఈ రెక్కుల కవితా ప్రక్రియలో మొత్తం ఆరు పాదాలుంటాయి. పాదాల నియమం తప్ప పదాల నియమం, అక్షరాల నియమం లేదు. విషయ విభజన బట్టి నాలుగు ప్లస్ రెండు పాదాలు ఉంటాయి.పై నాలుగు పాదాల్లో విషయం లక్ష్యంగా ఉండి చివరి రెండు పాదాల్లో లక్షణం ప్రతిపాదించ బడుతుంది. ప్రధానంగా ఈ ప్రక్రియలో కవికి పూర్తి స్వేచ్ఛ ఉంటుంది. అందుచేతనే ఒక విషయాన్ని కవి ముందుగా చెప్పి దాన్ని సమర్థించే సిద్ధాంతాన్ని చెప్పి ముగించటం అనే ఒక ప్రత్యేక శిల్ప లక్షణాన్ని కలిగి ఉంటాడు.

ఈ రెక్కులలో చివరి రెండు పాదాలు వేమన ఆటవెలదిలో మూడో పాదంలాగా ఒక సందేశాన్ని సామాజిక దృక్పథాన్ని కలిగించి పాఠకుల హృదయాలను త్వరగా ఆకట్టుకుంటాయి. వస్తు వైవిధ్యంతో జీవిత సత్యాలను ఎన్నో కోణాల్లోంచి వీక్షించిన వినూత్న ప్రక్రియ రెక్కులు.

రెక్కులు రూపకర్త సుగమ్ బాబు 'రెక్కులు'ను హిబ్రూ యూనివర్సిటీకి చెందిన ప్రొఫెసర్ డేవిడ్ షుల్మన్ "వింగ్స్ ఆఫ్ హోప్" గా ఆంగ్లంలోకి అనువదించారు. దీని వల్ల అంతర్జాతీయ స్థాయిలో రెక్కులు ప్రక్రియకు మంచి గుర్తింపు వచ్చింది.సుగమ్ బాబు ఎందుకు ఈ కవితలు రాశారో ఇలా చెప్పుకున్నారు. "దుఃఖంలోంచే అవును దుఃఖంలోంచే రెక్కులు రాశాను. చుట్టూ వ్యాపించి ఉన్న దుఃఖాన్ని పోగొట్టాలనే రాసాను. ఏదీ ఊహించి రాయలేదు. చూసే రాసాను. అనుభవించే రాసాను. మనిషి తన పరిధులు తెలుసుకొని జీవించాలని చెప్పాను అని నొక్కి వక్కాణించారు.

రెక్కులు - మానవజీవిత చిత్రణ:

ఈ రెక్కులు చెరుగ్గడ, జయపతాక సంపుటాలలో బాబు గారు జీవితసత్యాలు, తత్వాలు, సమాజం, ప్రకృతి, వివిధ మనస్తత్వాల ప్రవర్తనల్ని, వాస్తవిక విషయాల్ని ఇలా ఎన్నో తెలిపారు.

"కొడుకైతే

కొండలు పిండి కొడతాడా

ఆడపిల్లంటే అసంతృప్తా

చిన్న బుద్ధితోనే చిన్న చూపు"

సమాజం ఎంత అభివృద్ధి సాధించినా ఆడపిల్ల విషయంలో సంకుచిత భావాలతోనే ఉన్నారని వివరించారు.

"ఎంత జాగ్రత్తగా

తొడిగినా

చిరిగిపోతుంది బట్ట

మృత్యు ఛాయ వృద్ధాప్యం"

పుట్టిన ప్రతి ప్రాణి మరణించక తప్పదు అనే తాత్వికతను చక్కగా తెలిపారు. వారి బాటలోనే యెంతో మంది ఈ ప్రక్రియను చేపట్టారు.

"ఆకాశం

నీది కాదు

నది నీది కాదు

జీవితం నీది"

అంటూ ఈ ప్రపంచంలో ఏదీ నీది కాదు జీవితం మాత్రమే నీది అన్న వాస్తవిక దృష్టి కోణాన్ని కేశవరెడ్డి ఆనందవనం రెక్కులలో చక్కగా చెప్పారు.

"అద్భుత ప్రపంచం

ఎక్కడో లేదు

నీ చుట్టూనే

దృష్టి మార్చుకో

సృష్టి మారదు"

అంటూ పద్మకళ గారు మన సమస్యల పట్ల దృష్టి కోణం మార్చితే తప్ప జీవితం మారదనే జీవిత సత్యాన్ని వివరించారు.

"ఎన్ని గాయాలను

చేసిందో ఎన్ని గాయాలను

మాన్పిందో

కాలం చమత్కారి"

అంటూ నరేందర్‌రెడ్డి 'హంసధ్వని'లో కాలం విలువను వర్ణించారు.

"రికార్డు స్థాయిలో

మద్యం పెండర్లు

డబ్బొకరికి జబ్బొకరికి"

అంటూ ఎల్లయ్య గారు రెక్కులు కవితా ప్రక్రియలో నూతన వస్తు వైవిధ్యాన్ని సాధించారు.

"ఆకాశం

ఎత్తు కందాలని

కొబ్బరి మొక్క ఆశ

అందని ఆశ

నిరాశ అవుతుంది"

అని ఆశ ఉండవచ్చు కానీ నిరాశను చేకూర్చే ఆశ ఉండరాదని ఎంతో హృద్యంగా తెలిపారు నల్లా నరసింహమూర్తి గారు.

ముగింపు:

ఈ విధంగానే శ్రీనివాస్ గౌడ్, కలిమిశ్రీ, రాధాకృష్ణ, మోపిదేవి, రంగారావు, పరమేశ్వరరావు, కేతవరపు రాజ్యశ్రీ, వెంకటేశ్వర్లు, బృందావనరావు, రామచంద్ర రావు, బొల్లిముంత వెంకట రమణ రావు, వంగర పరమేశ్వరరావు, కైలాసపతి మొదలైన కవులెందరో ఈ ఆధునిక వచన కవితా ప్రక్రియ అయిన రెక్కులతో సమాజాన్ని విహంగవీక్షణం చేస్తూ తాత్విక, ప్రాకృతిక, వాస్తవికతల వైపు పాఠకులకి దిశానిర్దేశం చేస్తున్నారు. మరేందరో కవులు వారి ప్రజ్ఞాపాటవాలతో మంచి వచన కవిత్వాన్ని సృష్టించి తెలుగు సాహిత్యాన్ని సుసంపన్నం చేస్తారని ఆశిద్దాం.

ఆధార గ్రంథాలు:

1. నారాయణరెడ్డి, సి, (2001). ఆధునికాంధ్ర కవిత్వము, సంప్రదాయములు; ప్రయోగములు, విశ్వంభర విజయ్ పబ్లికేషన్స్ హైదరాబాద్.

2. సుగమ్ బాబు, ఎం.కె., (2009). చెరుగ్గడ, రెక్కుల సంపుటి, ప్రజాశక్తి బుక్ హౌస్, హైదరాబాద్.

3. సిమ్మన్న, వెలమల, (2014). తెలుగు సాహిత్య చరిత్ర, మూడో ముద్రణ, దళిత సాహిత్యపీఠం, విశాఖపట్నం.

4. రవి, తెలకపల్లి, (సం.) (2009, 2010, 2011, 2016 సంచికలు). సాహిత్య ప్రస్థానం పత్రికలు, విజయవాడ.

5. నరేందర్ రెడ్డి, ద్యావరి (2011). హంసధ్వని, రెక్కుల సంపుటి, విశాలాంధ్ర బుక్ హౌస్, హైదరాబాద్.

పసుపులేటి నాగమల్లిక
79813 64632

సాహిత్య శిల్పి బాపిరాజు

అడవి బాబిరాజు
కనువెలుగు: 8 అక్టోబరు 1895
కనుమరుగు: 22 సెప్టెంబరు 1952

మన తెలుగుజాతి గర్వించదగ్గ వారిలో శ్రీ అడవి బాపిరాజు గారు ఒకరు. ఈయన గొప్ప చిత్ర కారుడు,నవలాకారుడు, కథకుడు, నాటకకర్త, వ్యాసకర్త, వక్త, జాతీయవాది, పత్రికా సంపాదకుడు, ఉత్తమ అధ్యాప కుడు, న్యాయవాది, నటుడు, అన్నింటికీ మించి ప్రప్రథమంగా తెలుగు సినీ చలన చిత్ర రంగాన కళాదర్శకత్వం చేపట్టిన కళాతపస్వి, బహుముఖ ప్రజ్ఞాశాలి. కళారాధనకే తన జీవితాన్ని అంకితం చేసిన మహనీయుడు. కవిత్వంతోపాటు, సంగీత నాట్యాలలో కూడా పరిచయమున్న గొప్ప కళాకారుడాయన.

శ్రీ బాపిరాజు గారు 1895 అక్టోబరు 8వ తేదీన పశ్చిమ గోదావరి జిల్లా భీమవరం సమీపంలోని సరిపల్లె గ్రామంలో జన్మించారు. భీమవరం, నరసాపురంలో హైస్కూలు చదువు పూర్తయ్యాక, రాజమండ్రి ఆర్ట్స్ కళాశాలలో బి.ఏ. డిగ్రీ చేశారు. ఆనాటి కళాశాల ప్రిన్సిపాల్ ఆస్వాల్డ్ కూల్డే ఆంగ్ల భాషా కోవిదుడేకాక, ఆంగ్లంలో గొప్ప కవి, చిత్రకారుడు కూడా. శ్రీ బాపిరాజు కళాజీవితానికి నాందీ ప్రస్తావన చేసింది ఆ కళాశాల ప్రిన్సిపాల్ 'కూల్డే' అని శ్రీ బాపిరాజు పేర్కొన్నారు. ప్రిన్సిపాల్ తనపై ప్రత్యేక శ్రద్ధ కన్పరిచేవారని, ఎంతో ఆత్మీయతతో బోధిస్తూ, కళాదృష్టి ప్రసాదించారని శ్రీ బాపిరాజు అనేవారు. 'కూల్డే' ప్రోత్సాహంతోనే చిత్రకారుడిగా రాణించానని ఆయన చెప్పుకున్నారు. బి.ఏ. డిగ్రీ పూర్తయ్యాక కొంతకాలం జాతీయోద్యమంలో పాల్గొన్నారు. ఆ తర్వాత మచిలీపట్నంలోని జాతీయ కళాశాలలో చేరి శ్రీ ప్రమోద కుమార చటర్జీ వద్ద చిత్రలేఖనం అభ్యసించారు. శిల్పకళలోనూ, చిత్రలేఖనంలోనూ అనేక మెళకువలను చటర్జీ వద్ద శ్రీ బాపిరాజు నేర్చారు. ఆ తర్వాత మద్రాసులోని 'లా' కళాశాలలో న్యాయశాస్త్రంలో బి.ఎల్. పట్టా పొంది స్వగ్రామం భీమవరంలో న్యాయవాద వృత్తి చేపట్టారు. అయితే సుమారు ఏడాది కాలం మాత్రం న్యాయవాదిగా పనిచేసి, 1935లో బందరు జాతీయ కళాశాల ప్రిన్సిపాల్‌గా చేరారు. కళాశాల ప్రిన్సిపాల్‌గా తన గురువు కూల్డే మహాశయుని ఆదర్శంగా సుమారు నాల్గు సంవత్సరాలు బందరు జాతీయ కళాశాలలో పనిచేశారు.

ఆ తర్వాత తెలుగు చలనచిత్ర రంగంలో కళాదర్శకునిగా శ్రీ సి. పుల్లయ్య నిర్మించిన 'సతీ అనసూయ', 'ధ్రువ విజయం' 'మీరాబాయి' చిత్రాలకు కళాదర్శకత్వం నిర్వహించారు. ఆ రకంగా తెలుగు చలనచిత్ర రంగంలో తొలి కళాదర్శకులుగా శ్రీ బాపిరాజు మంచిపేరు సంపాదించారు. చలనచిత్ర నిర్మాణం తొలిరోజుల్లో 1930 ప్రాంతంలో ప్రత్యేకించి కళాదర్శకులంటూ వేరే ఉండేవారు కాదు.ఆ లోటును తొలిసారిగా కళానిధి శ్రీ బాపిరాజే తీర్చారు. అంతేకాదు, కళాదర్శకత్వానికి శ్రీ బాపిరాజు ఒక ప్రత్యేకస్థానం, గుర్తింపుతోపాటు, నేటి పలువురు కళాదర్శకులకు ఆదర్శంగా నిల్చారు.

అయితే, చిత్రరంగాన ఎక్కువకాలం స్థిరపడక, హైదరాబాద్ నుండి వెలువడే 'మీజాన్' దినపత్రిక సంపాదక బాధ్యతలు చేపట్టారు. తెలంగాణా ప్రాంతంలో ఆనాడు (1943) మీజాన్ పత్రికకు విశేష సంఖ్యలో పాఠకులుండేవారు. ఈ పత్రికలో 1943 నుండి1946 వరకు సంపాదకులుగా పనిచేశారు. వీరికి రచయితగా మంచిపేరు తెచ్చిపెట్టింది మీజాన్ పత్రికనే చెప్పాలి. శ్రీ బాపిరాజు తాను రాసిన నవలలు- కోనంగి, గోనగన్నారెడ్డి, నారాయణరావు, హిమబిందు, అడవి శాంతిశ్రీ, తుపాను, వీటిలో కొన్నింటిని మీజాన్ పత్రికలో సీరియల్స్ గా రాస్తూ, ఆ తర్వాత పుస్తకరూపంలో ప్రచురించారు. పత్రికారంగంలో ఎందర్నో ఉత్తమ జర్నలిస్టులుగా వీరు తీర్చిదిద్దారు. పత్రికా రచనలో నూతన విధానాలకు శ్రీకారం చుట్టారు. అయితే, నిజాం నిరంకుశపాలన, రజాకారుల దుండగాలను వ్యతిరేకిస్తూ, పత్రిక సంపాదకత్వాన్ని వదలి, గుంటూరులో కళాపీఠాన్ని నెలకొల్పారు. ఇక్కడ ఎందరికో చిత్రలేఖనంలో శిక్షణ ఇచ్చారు.

బాపిరాజుగారి చిత్రాలలో 'శబ్దబ్రహ్మ' భాగవత పురుష, సూర్యదేవ, సముద్రగుప్తుడు, రాధాకృష్ణ, గౌరీశంకరులు, శశికళ, మృత్యుంజయుడు, నటరాజు ఆనంద తాండవం, నాగనృత్యం, తిక్కన, మీరాబాయి ఇలా అనేకం ప్రముఖమైనవి. శ్రీ బాపిరాజు విశ్వనాధ వారి కిన్నెరసాని పాటలకు, నండూరి వారి ఎంకి పాటలకు చక్కని రేఖాచిత్రాలు గీసి ఆ గీతాలకు జీవం పోశారు. బాపిరాజుగారి శబ్దబ్రహ్మ చిత్రం డెన్మార్కులోని చిత్రప్రదర్శనశాలలో, పదిల పరచబడింది. భాగవత పురుష చిత్రం,తిరువాన్మూరులోనూ, సూర్యదేవ చిత్రం బీహార్‌లో, ఇలా అనేక చిత్రాలు పలు ప్రముఖుల ఇళ్ళలో అలంకరణాలుగా

తరువాయి 47వ పుటలో....

సందేహం లేదు. దీనికి తోడు భాషా సంస్కరణలో కూడా బ్రౌన్ తనదైన ముద్ర వేశాడు. బ్రౌన్ కృషి వల్ల ఆనాడు తెలుగులో ముద్రణ వికాసం చెంది ప్రజలకు అందుబాటులోకి వచ్చింది. తెలుగు భాషలో హల్లులు రాసేటప్పుడు చ – చ, జ – జ లు రాసేవారు. చంద్రుడు –చందమామ, జడ–జల్లెడ. ఈ అక్షరాలపైన 1,2 అని వేసేవారు. ఈ స్వల్ప భేదం అనవసరం అని తొలగించాడు.అలాగే ర–ఱ భేదాలు క్ర–క్ష భేదాలు సరిచేశాడు. అర్థానుస్వారము పూర్ణానుస్వార విషయంలోని క్లిష్టతను తొలగించాడు. 1836లో ముద్రితమైన రావిపాటి గురుమూర్తి శాస్త్రి తెలుగు వ్యాకరణంలోని ప్రయోగాలను సరిచేసిన దానికి పండితులు కొంతమంది విమర్శించారు. తర్వాత వాటి ఉపయోగాలను విస్మరించి వాళ్ళే సరయిన మార్గం ఎంచుకున్నారు. భాషా సంస్కరణలో ముఖ్యంగా గమనించవలసినది విరామ చిహ్నాలు. **బ్రౌన్ అనంతరమే మనకు తెలుగులో విరామ చిహ్నాలు, పుట సంఖ్యలు, అధ్యాయాలు, ఆశ్వాసాలు, భాగాలు మొదలయిన విభజన కనిపిస్తుంది.** తెలుగు వ్యాకరణ రచన 1840లో తొలిసారి అచ్చయింది. బ్రౌన్‌కి పూర్వమే ఎడి కాంబెల్ రచించిన A Grammar of the Telugu language, విలియం బ్రౌన్ రాసిన A Grammar of the Gentoo language,, బాగా ప్రసిద్ధి చెందాయి. దానికో కారణం ఉంది. ఈరెండు వ్యాకరణాలు పండితుల ప్రశంసకు పాత్రమైనవే తప్ప ప్రయోజనం అంతగాలేదు. 1814లో కేరీ ముద్రించినGrammar of the Telinga Language తెలుగు సంస్కృత జన్యమని ధంకాభజాయించాడు. అది పండితుల మన్నన కాని, ప్రజల ఆదరణకాని పొందలేదు (ఈ ప్రతి National Library కలకత్తాలో ఉంది).

ఇన్ని ప్రతికూల ప్రతుల మధ్య బ్రౌన్ వ్యాకరణం 12 భాగాలుగా విభక్తమయింది. మొదటి పదిభాగాలు వ్యాకరణాంశాలు పద కొండవభాగం ఛందస్సు. 12వ భాగం కళ, ద్రుత ప్రకృతి కావ్యాలకు సంబంధించిన ఉదాహరణలతో వివరించాడు. **బ్రౌన్ సంస్కృతాంధ్రభాషల సంబంధమే చెప్పాడు తప్ప జన్యజనక సంబంధమనలేదు. ఇంగ్లీషు వ్యాకరణాలు తొలినాళ్ళలో లాటిన్‌లోనే రాశారు. అలాగే తెలుగు వ్యాకరణము సంస్కృత విధానంలోనే వచ్చాయన్నాడు.** (A Grammar of the Telugu Language by CP Brown 1857 Page VI). దీనికి తోడు బ్రౌన్ వ్యావహారిక భాషకే పట్టం కట్టాడు. కొన్ని సందర్భాల్లో 1746లో వెలువడిన Benzamin Schultze రచనలు, 1728 షూల్జి వ్యాకరణం Grammatica Telugica లలోని ఉదాహరణలు వ్యావహారిక భాషలోనే ఉన్నాయని అది ప్రజల భాష అనీ అన్నాడు. తెలుగులో ఉన్న యతిప్రాసల ప్రస్తావన చేస్తూ గోతిక్ (Gothic) భాషలోనూ శబ్ద సౌందర్యం కోసం అక్కడక్కడా ఇలా ప్రయోగించడం సహజమన్నాడు. స్పానిష్ భాషలో కూడా ఈ పద్ధతి ఉందని పేర్కొన్నాడు. (పుటలు 314–315) అన్ని విధాలుగా తెలుగు భాషను, తెలుగు సాహిత్యాన్ని తీర్చి దిద్దిన బ్రౌన్ మహాశయుడు ఆంధ్ర బంధు, వాఙ్మయోద్ధారకుడు, ధన్యజీవి, కారణ జన్ముడు మొదలయిన బిరుదు వాచకాలు అనేవి ఇంకా తక్కువేమో.

(నవంబర్ 10 సి.పి. బ్రౌన్ జన్మదినోత్సవం. ఆయన పుట్టి 225 సంవత్సరాలు)

–తరువాయి వచ్చే సంచికలో

38వ పుట తరువాయి...

సాహిత్య శిల్పి బాపిరాజు....

శోభనిస్తున్నాయని బాపిరాజు గారి అభిమానులు పేర్కొంటారు.

బాపిరాజు గారి తిక్కన్న చిత్రం ఆంధ్ర విశ్వ కళాపరిషత్ బహుమతి పొందింది. వీరు సింహళం వెళ్ళి, అక్కడి సిగీరియా కుడ్య చిత్రాల్ని చిత్రించారు. అవి మద్రాసులోని ప్రభుత్వ మ్యూజియంలో ఉన్నాయి. కేవలం చిత్రాలు గీయడమే కాకుండా, సామాన్యులలో సైతం చిత్రకళపై అభిరుచి కలిగేలా అనేక పట్టణాలలో చిత్రకళపై ఉపన్యాసాలు ఇచ్చి, చిత్ర కళాభివృద్ధికి కృషిచేశారు. ఇందుకోసం ప్రత్యేకంగా ఒక పత్రిక స్థాపించాలని ఆశించినా, ఆ ఆశయం ఫలప్రదం కాకుండానే శ్రీ బాపిరాజు కన్నుమూశారు.

వీరి కథలు రాగమాలిక, అంజలి, తూలికానృత్యం, తరంగిణి, భోగీయలోయ తదితర కథలు భారతి, మీజాన్ పత్రికలలో ప్రచురితమయ్యాయి. కథల్లో ప్రకృతిలోని యావత్తు సౌందర్యాన్ని దర్శింపజేస్తారాయన. వీరు గేయరచయితగా 'శశికళ'ను తన ఆరాధ్యదేవతగా అనుక్షణం అన్వేషిస్తూ ఎన్నో ప్రేమ, భక్తి పూర్వక భావగీతాలను రాశారు. శశికళ గేయాలు ఆకాశవాణిలో తరచూ ప్రసారమౌతాయి. 'పాడకే నా రాణి పాడెదను నీకునై పాటలను దేవి' ఈ గేయం – ఘంటశాల వారి గళంలో సాహితీప్రియుల, ఆకాశ వాణి శ్రోతల అభిమానాన్ని చూరగొన్నది.

శ్రీ బాపిరాజు 1949–50 ప్రాంతాల్లో ఆకాశవాణి విజయవాడ కేంద్ర సలహాదారుడిగా పనిచేశారు. ఆ కాలంలో తన నవల 'నారాయణరావు' రేడియో నాటకీకరణచేసి, అందులో జమీందారు పాత్రను తానే స్వయంగా పోషించి, నటుడిగా, రేడియో శ్రోతల అభిమానాన్ని కూడా పొందారు. అలాగే శైలబాల, భోగీయలోయ, ఏరువాక, తదితర రేడియో నాటకాలను శ్రీ బాపిరాజు రూపొందించారు. **1920 తర్వాత అడవి బాపిరాజులాంటి అనన్య ప్రతిభాపాటవాలు గల మహోన్నత వ్యక్తి ఆంధ్ర సాహిత్య సాంస్కృతిక చరిత్రలో లేడని సాహిత్య పరిశోధకులు భావిస్తారు.**

అడవి బాపిరాజు గారి ఇంటిపేరు అడవి గానీ, ఆయన మాత్రం సాహిత్య నందనవనం అని ఆయన సమకాలీనుడు 'కరుణశ్రీ' ఒక సందర్భంలో బాపిరాజుగారి గురించి వ్యాఖ్యానించారు. అలాగే, శ్రీ బాపిరాజు గీసిన గీత బొమ్మవుతుంది. అతడు పల్కిన పలుకు పాటవుతుందని ప్రముఖ కవిపండితులు శ్రీ విశ్వనాథ సత్యనారాయణ అన్నారు. కల్లాకపటం, మాయామర్మం ఎరుగని వాడుగా, మిత్రులందరికీ తలలో నాల్కలా, పిల్లల్లో పిల్లవాడిగా, పెద్దల్లో పెద్దగా, ఆత్మీయుడిగా అందరిచేత 'బాపిబావ'గా పిలిపించుకుంటూ అందరివాడుగా జీవితం గడిపిన శ్రీ బాపిరాజు తన కళాప్రపంచాన్ని వదలి 1952 సెప్టెంబరు 22న గుండెపోటుకు గురై కీర్తిశేషులైనారు. తెలుగు సాహిత్య, సాంస్కృతిక చరిత్రలో సుస్థిరస్థానం సంపాదించిన శ్రీ బాపిరాజు రాసిన గ్రంథాలు,గీసిన చిత్రాలు మాత్రం కళాభిమానులకు, కళాకారులకు ఎంతో ఆదర్శం.ఇంతటి కీర్తి గడించిన వీరు తెలుగు వారికి సదా చిరస్మరనీయులు.

వ్యాసరచన– తెలుగు శాఖాధిపతి, ప్రభుత్వ డిగ్రీ కళాశాల,
రామచంద్రపురం, కోనసీమ జిల్లా.

ఈ సంచిక మూడవ అట్ట(51వ పుట) కూడా చూడండి

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Sense of love towards nature and children in the short stories of Ruskin Bond

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Abstract:
The portrayal of child characters in the hilly areas of Dehradun by thewriter Ruskin Bond has become his trade mark. He describes childhood alongwith the naturein such a beautifulway that the readers become mesmerized with is writings. He talks about nature, about life and the difficulties which are faced by the people in the mountainous villages. There is lack of opportunity for the youth and they are bound to live in a limited means withoutany development. People have to migrate to outside cities for their livelihoodleaving behind their childhood and their families alone. The emotional distancewhich is created by the separation of working members and the children of thefamilyisverypainful.RuskinBondraisesthiskindofissueswiththehelpofhisstoriesandnovels. His words are very simple as well asharsh in certain situations. He deals with his plots in such a way that the outputsituations isfelt favorable to the readers and doesjustice to his characters. Hehas never let his child and youth characters down are being carried away by theinfluence of others. He sees throughout the story that his characters win over theill situations and lead a happy life in the future. The love for Ruskin Bond towards children is seen in most of his novels.Most of the senior writers don't give much emphasis to characters of children. But, Rusk in Bond gives a special importance to children and thoroughly explains their character and their thought process which is very innocent. All petty activities related to children like jumping in stay water on the road, climbing a tree to pluck a mango, wandering in the streets and observing others and nature etc. are described in detail. This tickles the funny bone of the readers who have had similarly thoughts in their childhood. The feeling of childhood helps people to hold themselves fromthe effects of ill post-modernism. The nature of children is universal all over the world. Rusk in Bond has shown the habits of children that are equalinevery part of the world.

Keywords*: mesmerized, innocent, wandering, emphasis*

Introduction: Ruskin Bond is one of the most popular recent Indian writers in English. Ruskin bond is truelove of nature. Nature and ecology is one of the dominant themes in his works. One findsWordsworth's pantheistic philosophy in Ruskin Bondthat is presence of life or spirit in every object of nature like trees, plants, rivers. He lives in Mussoorie, at the foothills of the Himalaya. The region is blessed with an abundance of natural beauty, flora and fauna. Bond is worried about destroy of the natural environment in the name of development. His deepconcerned is depicted his short stories. Writing with love, his pure, innocent characters represent his lovefor nature. They interact with animals, trees andflowers; they reflect his concern and his effort topreserve the environment through tree plantation.The stories highlight the duty and responsibility tothe environmentthe aim of this paper is to highlight how Ruskin Bond has expressed his concern for nature which has been exploited by human beings in the name of urbanisation and modernisation and how the harmful effects of humans' exploitation of nature directly affect human life and living space.
Ruskin Bond shows exceptional talent in writing about nature and children. His enchanting stories are woven with splendid Himalayas as the background against which human activities depict themselves. He writes about ordinary people living in small towns of Himalayas and his stories deal with simple things in life. His description of Indian bazaars of the early post independent period is a mirror reflecting the social setting, culture and traditions of the people of small towns. The child protagonists and other prominent child characters are woven around these settings and locales in a semi – humorous and compassionate manner to form a rich fabric of fascinating stories like the Adventures of Rusty and his friends in the novels ***The Room on the Roof*** *(1956)* and The ***Young***

***Vagrants** (1981).* Bond's works clearly show his love for animals and nature. Nature has been a great strength and a source of solace and comfort for Bond. He derives inspiration form nature.

The Cherry tree is a simple story that unleashes an enormous love for nature. The story revolves around Rakesh – a small boy living with his grandfather in Mussoorie. One day, he plants a cherry seed in his garden and forgets about it. One day, he notices that the seed has just sprouted and begins to protect the plant from various disasters; alongside the multiple seasons and climatic changes, he shields the plant and showers his love. When Rakesh turns 9, the plant gives its first fruit as the most significant gift.The story strives to emphasize that hard work and perseverance never fail. It also nurtures the quality of love towards nature. Your kid will learn to work hard and not depend on shortcuts.

Ghost trouble is a story about a naughty ghost – pret who lives in a peepal tree. Pret plays random mischievous pranks over the people who come around. One fine day, the peepal tree is cut down in the name of commercialization and development. That is when Pret gets stranded as a refugee and enters a house. Pret builds a bond with a small boy in the house and starts playing pranks with the people in the house.Though initially, the people of the house get scared, gradually they understand that Pret has no intentions to harm anyone and accept him as one among them in the family. This story drives the wild imaginations of your kids, where they imagine and picture. Pret and his naughty pranks.It also teaches us the most important lesson about how bad it could be to damage nature in the name of development.

Cricket for the Crocodile is a hilarious plot where Ruskin Bond explains how important it is for human beings to coexist with wildlife. The story is about a lazy crocodile in a village called Nakoo, and he never likes being disturbed by human beings. The boys in the city and village, along with a few other characters, play cricket near the river banks in which Nakoo resides. When Nakoo gets disturbed by the game of humans, it comes out to play its own game with humans. The plot portrays not only hilarity but also empathy towards fellow living species.

Dust On the Mountain is about a simple young boy Binsu, who loves nature and his village. He takes different odd jobs from other places to support his family. He meets different people alongside the travel, makes new friends, and always stays optimistic.Once he comes across the limestone quarry that destroys nature in the name of development and commercialization, he realizes his inbound love for nature and the need to protect it. He has to either stay in the city to support his family or return home to protect nature. This story again emphasizes the need to preserve our mother nature. It also builds within the kids the perseverance and optimistic character to build upon to stay positive throughout the obstacles that they may face in life.

The high moral code present in the child characters of Ruskin Bond, their strugglefor survival and undaunted spirit makes these child characters an inspiration for the young andold alike. The deeply embedded sense of honesty, sensitivity and maturity makes their storydidactic and a lesson in philosophy of life. Through their ordinary experiences these charactersdisplay extra-ordinaryqualities of head and heart. These characters are not entirely fictitious for the children he came across in villages, their everyday experiences suggested themes for his stories.

The Blue Umbrella begins with the story of a girl named Binya who lives with her mother and elder brother Bijju in a beautiful village along the hillside of Himachal Pradesh. One day, Binya found a Blue Umbrella owned by a group of Japanese tourists who had been to the valley. She was fascinated by the umbrella and was overwhelmed when the tourist offered to trade the umbrella for her leopard-claw pendant.

The Blue umbrella caught the eyes of an envious local shopkeeper, Ram Bharosa, who plans to steal the umbrella. How he steals the umbrella and what happens at the end will melt the reader's heart. The story carries us over to the beautiful valley of Himachal Pradesh. It also teaches us the ill effects of being envious and how being kind and caring help a person stand out and succeed in life.

The Thief is another short story all about a 15-year-old boy, a thief who happens to be the story's narrator. Accidentally he meets a man – Arun – in a wrestling match. Arun makes an effort to provide the thief with a good life. The thief begins to live with Arun and does all the household chores. Arun, in return, teaches the thief to read and write. One fine day, the thief robs Arun and tries to run away. But the love and trust that Arun had immensely poured into the thief brings him back home. That is when the author makes us realize the power of trust and love that changes the people around us.

From ***Rusty, The Boy from the Hills***Rusty is a famous fictional character created by Ruskin bond. The books consist of several short stories about Rusty, who lives with his grandparents. He is sensitive, docile, and an adventurous boy who encounters unusual experiences. This book gives the kids a roller coaster ride that kindles the kids' imagination to think outside the box—from the pet python, surviving an air crash, encountering a ghost, and many more experiences that never fail to touch the tip of our children.

The Angry Riverexplores the courage and high moral values of a young twelve year old girl'Sita' who lives on an isolated island with her grandparents surrounded by the river. The courage displayed by the young girl as her hut gets washed away in the torrent when she is all alone. Herundaunted spirit makes her fight the floodand save herself. She does not give in to her fears eventhough she is afraid. She shares her fears with her only companion her doll which she calls'Mumta'. Her faith in the divine remains unshakable as she believes that just as she created'Mumta'and would always protect her similarly, God created her and will always look after her.On finally being united with her grandfather she understands with great sensitivity thatgrandmother has not survived and that 'it would be on her shoulder that grandfather would haveto lean in the years to come.

Dust in the Mountain is yet another poignant story of a young boy Bisnu, twelve, who takes on the responsibility of the man of the house. He comes to Mussoorie to work at a tea kiosk for a meagre fifty rupees, sleeps in the verandah in the cold winter nights. 'I will go to Mussoorie to find work. There is money to be made there, if not I will come home. I can walk back over the Naag Tibba Mountain. It will take only two and half days and I will save the bus fare'. He faces many hardships but does not quit. His moral values make him take on the responsibility of providing for his mother and younger sister. His maturity in the end makes him go back to his village as he realizes after working at the lime quarry that it is more fun to create, grow than to destroy. 'I will work on my land. It's better to grow things on land than to blast things out'. His sensible and mature makes him an inspiration for the boys of his age.

The Guardian Angel explores the individuality of children in judging the people around them. They do judge people by the adult perceptions. They have their own moral parameters. Despite knowing about his Aunt's less than moral ways of living the author still recalls of her as the very special guardian 'Angel of my childhood'9 unlike adults children do not judge a book by its cover. The narrator does not think of his aunt in a bad light because he knows how to distinguish profession from personal. Despite her shady profession Aunt Marian's love for him was pure and unadulterated.

Conclusion:

Ruskin Bond's characters are more factual than fictional. He draws liberally from his observations. His fascination with the hills particularly Mussoorie and its simple inhabitants makes him create characters that are so real that the reader can easily identify with them. This paper intends to explore the high moral values and strong will power, the undaunted spirit and courage exhibited by these child characters that make them stand apart in the crowd despite their humble and modest upbringing. Their struggle to survive in the hostile environs without compromising on their integrity and honesty makes them extra-ordinary.Bond's fiction resembles inhaling a lungful of new mountain air, His relationship with Nature is extremely intimate. He is a lover of Nature. In Nature he can feel warmth of his parents' affection, his companion's love, children's care and latent quality. Everything in Nature rouses him whether it is a sweet sounding winged animal or harsh throated frog, blooms or clear sky or rainfall, chill winter or singing heat, fields or barren lands. For Bond each aspect of Nature is fascinating. He doesn't deal with social issues, psychological break downs or political scams in his compositions yet centers around the celestial beauty of the slopes. His fictional canvas is brimming with the drawing of the enchanting dales of Garhwal. Indeed, even the glamor of London, attraction of its streets, charm of the skyscrapers, its alluring social life couldn't keep him from coming back to the small slope town Mussoorie in India.

Bond is a strong votary of individual opportunity. According to him opportunity is necessary not just for human being however for natural life also. He does not appreciate tampering with nature in the name of progress. In stories like "My Father's Trees in Dehra", "Sita and the River", he raises his voice against deforestation and destruction of the landscape. He feels that a person should stay in contact with nature to retain the basic human values like sympathy and love.

References:

- Bond, Ruskin. ***Dust in the Mountains***. New Delhi. Penguin Book India Pvt.Ltd.2009.Print.

- Bond, Ruskin .***Rain in the Mountains***. New Delhi. Penguin Book India Pvt.Ltd.1993.Print.
- Bond, Ruskin. ***Our Trees Still Grow in Dehra***. New Delhi. Penguin Book India Pvt.Ltd.1991.Print.
- Bond, Ruskin. ***The Adventures of Rusty***. Living Media Publication.1981.Print
- Bond, Ruskin. ***Scenes from a Writer's Life***. New Delhi. Penguin Group India.1997.Print.
- Khorana, G. Meena. ***The Life and Works of Ruskin Bond***. United States of America.2003.Print.
- Singh, K. Prabhat. ***The Creative Contours of Ruskin Bond***: *An Anthology of Critical* Writings. Pencraft Publications.1995.Print
- Bond, Ruskin: Children's Omnibus, New Delhi: Rupa Publications India Pvt. Ltd, 1995, pg. 40. Print.
- Aggarwal, Amita : Fictional World of Ruskin Bond Sarup& Sons, 2005, pg.88. Print.
- Sahoo Kumar, Prafulla: Treatment of child in the Short Stories of Ruskin Bond, 2014, pg. 473. Print.
- Bond, Ruskin: Children's Omnibus, New Delhi: Rupa Publications India Pvt. Ltd, 1995, pg. 98. Print.
- Ritu, Dr. : The charmed world of childhood in Ruskin Bond's Fiction, 2014, pg. 36. Print.

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Do ESG had influence on Return on Investments of BRICS listed Stock Exchanges:An Empirical Study

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Abstract

Objective: The current study aimed to identify which factor of ESG influences on return on investment of the select BRICS nations during pandemic. Method: To attain the proposed objective, the total population of BRICS nations listed in the Refinitiv Model Conversion Tracking Sheet was considered. Out of the 150 BRICS nations listed, 122 companies (81%) were selected for the study. Secondary data from the Refinitiv Eikon database for 2021-22 was used. PLS Algorithm was applied to investigate the relationship between ESG and its correlation to financial performance. Results: The results suggest that the ESG factors influence the financial performance of the selected BRICS nations during the COVID-19 period. Further, the Combined ESG score and Controversies influenced the financial performance measured on the Return on Sales (ROS). Conclusion: ESG goals have become ever more predominant during COVID-19 in every economy but identifying which factor of ESG is influencing the performance of listed BRICS companies is yet to be investigated. The current study addresses this gap by identifying the ESG factors affecting financial performance during the COVID-19 period.

Keywords: ESG performance, Sustainable Development, Return on Investment.

1. Introduction

The term "ESG''or "Sustainable Development Goals"has been an area of interest in identifying their influence on financial performance, including the corporate board meetingsfor the past two decades (Peiro-Signes, A., Segarra-oria, M., Mondejar-Jimenez, J., Vargas-Vargas, M., 2013). The relationship between Environment, Social, and Governance (ESG) and financial performance plays a vital role in investing in ESG factors, especially for the corporate companies listed in the BRICS index to have rewarding returns on social issues. Over the past one and half decades, there has been a shift in the notion of businesses from improving financial improvement to meeting shareholders'priorities. Further, this will influence factors like the P/E ratio, market capitalisation, environmental, social, and governance (ESG) factors.

The impact of the COVID-19 pandemic globally became a significant turning point for

ESG investing by policymakers, companies, and investors. In addition, the governments globally stimulated sustainable revolution by including ESGs in crisis management (J.P. Morgan, 2020). Thestakeholders of the companies listed on stock exchangesworldwidealso have beenpaying more attention to implementing corporate environmental,social,and governance responsibilities to protect the stakeholder's social issues and earn returns.Studies on ESG also have become a scorching issue, especially concerning the impact of ESG performance on corporate value, which has engrossed wide attention on the environmental (Gerged, A .M., Beddawela, E., & Cowton, C.J. (2021) and social factors (Albuquerque, R., Durnev, A., Koskinen, Y. (2018). Corporate governance performance on the financial performance of the companies selected for the sample (Drakos, A.A., & Bekiris, F.V., 2010). The findings of past studies proved that improving ESG performance would improve corporate market value. While the contemporary era, in the face of financial and non-financial risks, the net worth of companies that perform well in ESG is reasonably stable, and their prices are more flexible (Broadstock, D.C., Chan, K., Cheng, L.T.W., & Wang, X. (2021).

BRICS are the developing countries in the world.BRICS occupy around 27% of the geographical land area, 42% of the global per capita income, and 24% of the world's gross domestic product. The BRICS countries are poised to experience economic growth in terms of GDP and have huge growth potential in all demographic factors. In the coming50 years, BRICS will focus on providing more inclusive, representative, and participatory financial instruments of global governance. This study emphasizes analysis of the environment, social, and governance magnitude of the BRICS countries to justify the possible impact of these sustainability indicators on financial performance in all-inclusive terms that relates to the ESG-FP (Environment, Social,& Governance–Financial performance).It has been classified into three categories, environmental, social, and governance. ESG has become ever more predominant in every economy but identifying which factor of ESG is influencing the performance of listed BRICS companies is yet to be investigated. The current study seeks to formulate the following research questions to address the gap.

1. Does ESG have any impact on financial performance in the BRICS countries?
2. Which ESG variable in specific is improving the financial performance in terms of returns to sales in the BRICS countries?
3. Do controversies have any impact on ESG in the BRICS countries?

2. Review of literature and Hypotheses Development

Theoretical Framework

The BRICS CSR (Corporate Social Responsibility) model considered in the study represents the intersecting model stated by Geva (2008). All the functions of ESG, resembling overlapping rather than individual impact, influence the firm's financial performance (See Figure 1). CSR is a voluntary contribution to sustainable development beyond legal requirements. But, due to statutory mandates by respective countries' regulatory bodies, CSR activities have seen an upsurge. Hence, the study attempted to determine the individual ESG factors and the combined effect of ESG on the financial performance of BRICS during the COVID-19 period.

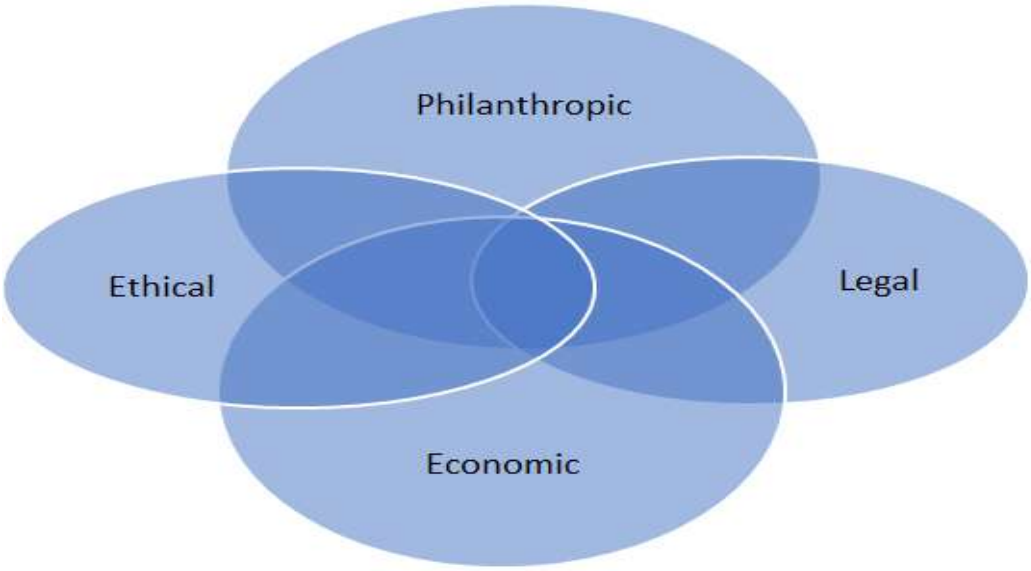

Figure 1: *CSR Intersecting Model*

Social, Environment, Governance and Financial Performance

Past studies on social factors of ESG found a negative and significant effect on market indicators and a negative but insignificant effect on financial performance for accounting indicators (Mardini, G. H., 2022). Further, they opined that the social factors affect a firm's competitive edge adversely and the overall credibility of the firm (Mardini, G. H. (2022). Socially responsible policies positively influence corporate performance (Ionescu, G.H., Firoiu, D., Pirvu, R., & Vilag, R.D., 2019; Landi, G., Sciarelli, M., 2018;Chitra Sriyani De Silva Lokuwaduge & Kumudini Heenetigala, 2017), thus providing several advantages. They minimise the fixed costs, lessen financial risks, enhance core competencies, advance corporate identity and increase consumer loyalty (Peiro-Signes, et al, 2013; Morrison, R., 2021; Albuquerque, R., et al, 2018; Wang, J., Song, L., & Yao, S., 2013;Shaukat, A., Qiu, Y. & Trojanowski, G., 2016; Whelan, T. Atz, U., Van Holt, T., Clark, C., 2021; Velte, P., 2017; Luo, X., Bhattacharya, C.B., 2008). In the same vein, studies (J.P. Morgan, 2020) highlighted that companies engaging in irresponsible or illegal behaviors cause inconvenience to shareholders. Further, studies also found that to enhance corporate value, socially accommodating behaviors to the law are required (Cardillo, G., Bendinelli, E., & Torluccio, G., 2022). It is predominant to highlight that not all studies agree upon the relationship between social responsibility policies and corporate performance.

Economically established companies can afford to upgrade with technical skills for disclosing CSR information which is knit with social and environmental performance (Clifford, G.H., C.P., Randall, S.K. & Dennis, P.S., 1999; Horvathova, E., 2010; Inoue, Y., & Lee, S., 2010). Past studies identified that top-level management would devise conceptual strategies to establish a relationship between ESG and a firm's performance for large corporate. Further, they found that top management's positive involvement enhanced transparency and accountability and maximised stakeholder trust. The top-level management has the legitimate power to improve the ESG effect, responsibility, employee trust, and customer loyalty, safeguarding social concerns and putting ESG into practice. In the past, contrary studies found a relationship between ESG performance and the presence of women on the board of directors (Velte, P., 2017), despite a positive and no significant relationship between management gender diversity and ESG disclosure (J.P. Morgan, 2020). Further, studies researched the relationship between corporate governance and corporate finance and found that firms with

more substantial shareholder rights had higher firm value, higher profits, and higher sales (Gompers, P., Ishii, J., & Metrick, A., 2003).

Hence, the first, second, and third hypotheses of the study are:
H1: The social factor does not have any significant impact on financial performance.
H2: A positive relationship exists between governance and a firm's financial performance.
H3: Environment does not significantly impact a firm's performance.

Controversies, Profit-to-Book Value, ESG and Financial Performance

Past studiesopined that the effect of CSR on CFP (Corporate Financial Performance) might vary as per the time horizon. CSR's impact on CFP may be positive in the long term and negative in the short term. Hence, they stated that long-term financial planning would help the active favorable outcomes to shareholders . Further researchers found inverse curvilinear relations for short-term and medium-term investment horizons. Based on the sample chosen for study and socially responsible investment diversification, CSR effects in the short term may be positive and negative in the medium to long term . In the relation between CSR and performance analysis,size is a significant variable to be measured. On the contrary,few studies argue that firm size does not significantly influence this field of study. Further, studies advocate that the effects of CSR policies carried out by stock-listed companies show more real consequences than those of non-stock-listed ones.

The empirical analysis ofthe financial performance of ESG will enter the lexicon of investors, managers and other stakeholders in a significantway. ESG has been a surrogate for assessing the influencing factors on financial performance. There is an urge of BRICS-listed companies to be informative about the ESG influencing factors on financial performance,as it has a direct contribution to the GDP growth of every country.Several studies have investigated an existing direct causal relation between ESG and financial performance (Landi, G., Sciarelli, M., 2018; De Silva Lokuwaduge, C.S. & Heenetigala, K., Peiro-Signes, et al, 2013; 2017; Morrison, R., 2021; Albuquerque, et al, 2018). Yet, investigations could not univocally exemplify that ESG factors might affect their respective corporate results either positively or negatively (Shaukat, A., Qiu, Y. & Trojanowski, G., 2016; Whelan, et al, 2021; Velte, P., 2017). Several studies have analysed the impact of responsible corporate behaviours and non-financial information (sustainability disclosure) on business performance but have no consensus.

Further, the findings of past studies on ESGs and financial performance are inconclusive and lack consensus. The lack of consensus amongst various studies might be due to the period chosen (the first quarter of 2020), the geographical region taken for research and the economic strategies and type of economic agents and strategies considered (Cardillo, G., Bendinelli, E., & Torluccio, G., 2022).Hence, the current study addresses this gap by identifying the ESG factors affecting the financial performancein terms of returns to sales of BRICS nations in COVID-19 during 2021-22.

Hence, our fourth, fifth, sixth, seventh and eighth hypotheses:
H4: Controversies do not have any significant impact on ESG
H5: Controversies negatively influence a firm's financial performance.
H6: Profit-to-Book value has no significant effect on the firm's financial performance.
H7: ESG positively influences the financial performance of a firm.
H8: Combined ESG positively influences a firm's financial performance.
To test the above hypotheses, the ESG and financial performance model (for the COVID

period, 2021-2022) was proposed and presented in Figure 2.

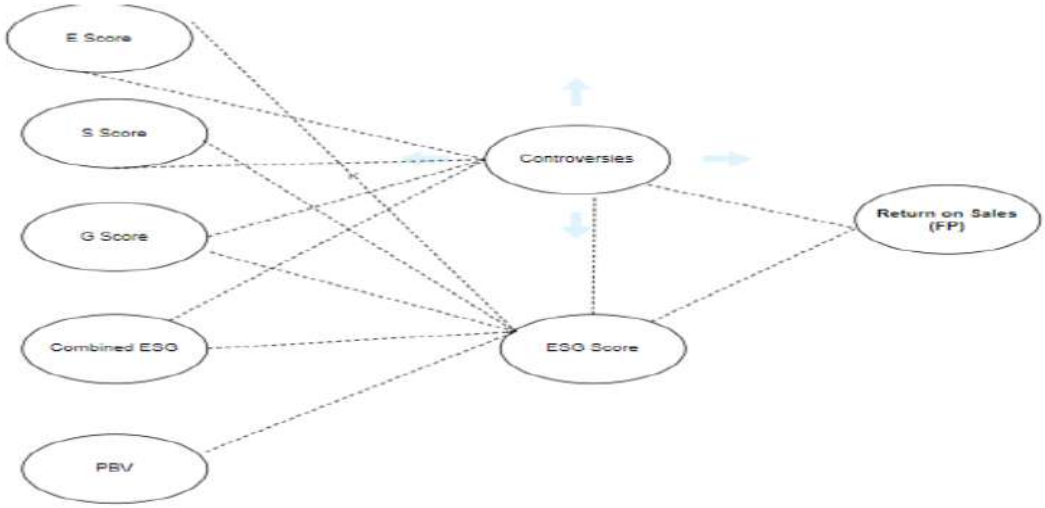

Figure 2. *Proposed Model for ESG Influence on Financial Performance*

The above model (See Figure 2) attempts to explain the Environment,Social, Governance, and other factors, namely combined ESG and Profit-to-Book Value (PBV),that influence the financial performance of sales. PLS-SEM is a path analysis technique developed to construct a model which establishes a relationship between ESG & other components' impact on financial performance.The sample data advocates that ESG and ESG components positively influence financial performance.

3. Method

The total population of BRICS nations listed in the Refinitiv Model Conversion Tracking Sheet is collected. Out of those 122 companies (81%), data from 150 companies was used. The null parameter was exercised and hence, the model was constructed with 122 companies only. Secondary data from the Refinitiv Eikon database for 2021-22 was extracted. PLS Algorithm is used for the proposed model to investigate the relationship between ESG and its correlation to financial performance. Findings indicate that ESG funding is not a mere investment but an investment avenue to convert into assets/claims to earn an economic advantage. The results suggest that the ESG factors influence the financial performance of the selected BRICS nations. Further, the Combined ESG score and Controversies influenced the financial performance measured on the Return on Sales (ROS).

The total population of BRICS nations listed in the Refinitiv Eikon is collected. 122 companies out of 150 companies' data were considered for the study. Using the NULL parameter,the model was constructed with 122 companies. This comprises of eighty-one percent of the data for the analysis, taken fromRefinitiv Eikon database for the year, 2021-22.

Both absolute and relative sustainability measurements were used for each BRICS-listed company. Finally,the‘ESG influence on Return on sales (FP) customised using the quotient of BRICS sample data which provides a rounded and inclusive evaluation of a company's ESG performance based on the reported information was shown. The ESG scores were calculated to transparently and objectively measure a company's relative ESG performance. ESG controversies commitment and effectiveness with Profit to Book Value, which is well known, refers to the relatively higher performance of the selected sample. PLS-SEM was used to test the proposed model. The results of the PLS output for the proposed

hypotheses are shown in Figure 3.

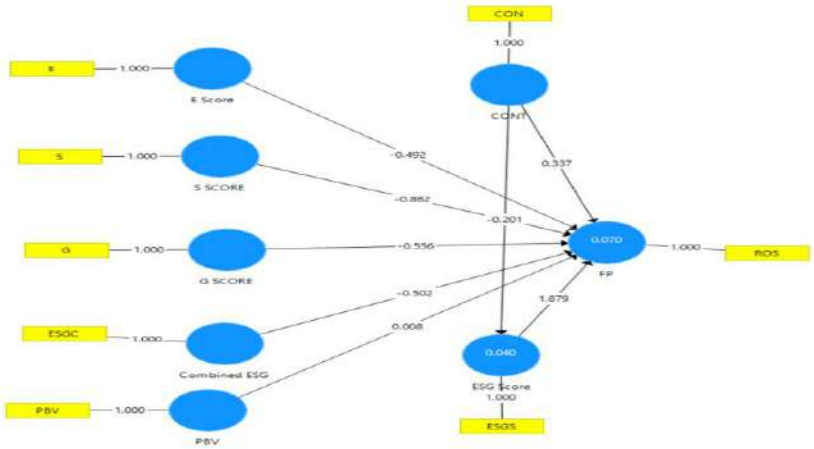

Figure 3. *PLS Output on PLS Algorithm used for proposed model*

From the above modelpresented in Figure 3, the independent variables considered in the study are E Score, S Score, G Score, Combined ESG Score, Profit to Book Value, Controversies and ESG Score to find the impact of the financial performance of BRICS selected sample in the form of Return on Sales. Return on Sales has been taken as a dependent variable because it measures how efficiently a company turns sales into profits. Returns on Sales are only applicable when comparing companies in the same line of business and of roughly the same size. Hence,all BRICS-listed companies' return on sales was thedependent variable on ESG.

The acceptable validity and reliability of any model, the derived should be greater than 0.7. In the proposed model, all the values are one, which implies that the model is valid and reliable. It means that ESG and other ESG-related components influenced the financial performance of the sample BRICS data from Table 1.

Table 1: *Validity and Reliability of ESG on Financial Performance*

Particulars	Cronbach's Alpha>0.07	rho_A	Composite Reliability>0.7	Average Variance Extracted (AVE)>0.5
CONT	1	1	1	1
Combined ESG.	1	1	1	1
E Score	1	1	1	1
ESG Score	1	1	1	1
FP.	1	1	1	1
G SCORE	1	1	1	1
PBV.	1	1	1	1
S SCORE	1	1	1	1

Discriminant validity was used to test the distinctiveness of the variables used in the study. Each variable is correlated to other variables to identify their competencies. According to the analysis, in the discriminant validity test, each variable value should be less than 0.9. For instance, the discriminant variable, financial performance, has positive and negative values, but all those values are less than 0.9. From the results, it was found that the competitive variables in the study are not too highly correlated and have their identity. To assess discriminate validity, the HTMT criterion was employed. From Table 2, it is clear that all the

variables are less than 0.90; hence, the individual variables have their individual identify).

Table 2: *Discriminant Validity of the proposed model*

Particulars	CONT	Combined ESG.	E Score	ESG Score	FP.	G SCORE	PBV	S SCORE
CONT	1							
Combined ESG_	0.487	1						
E Score_	-0.2	0.515	1					
ESG Score	-0.201	0.709	0.747	1				
FP	0.011	-0.032	0.007	0.012	1			
G SCORE	-0.74	0.453	0.204	0.624	0.028	1		
PBV	-0.063	-0.014	0.081	0.032	0.006	-0.006	1	
S SCORE	-0.182	0.605	0.54	0.846	0.054	0.273	0.027	1

Findings indicated that for the Controversies and ESG Scores, the P values are 0.026 and 0.03, which are less than 0.05, which signifies that these variables influence financial performance when considering economic, social, and environmental scores. Individual economic and environment scores had p values of more than 0.05. It implies that these variables are less significant in influencing the financial performance of the selected BRICS sample. In addition, profit to book value is also not affecting the sample's performance in terms of scale returns. Further findings indicated that social controversies and combined ESG scores have a limited impact on the firm's financial performance as they are significant at 10% significance levels (P value <0.10). The results are presented in Table 3.

Table 3: *Path Analysis of the Proposed Model*

Variables	Original sample (o)	Sample Mean(M)	Standard Deviation (STDEV.)	T Statistics (IO/STDEVI)	P Values
CONT->ESG Score	-0.201	-0.199	**0.09**	**2.232**	**0.026**
CONT->FP	0.337	0.341	**0.188**	**1.795**	**0.073**
Combined ESG_->FP	-0.502	-0.515	**0.27**	**1.857**	**0.064**
E Score_ ->FP	-0.492	-0.478	**0.411**	**1.198**	**0.232**
ESG Score_>FP	1.879	1.852	**0.879**	**2.138**	**0.033**
G Sore->FP	-0.556	-0.544	**0.343**	**1.622**	**0.105**
PBV->FP	0.008	0.015	**0.052**	**0.147**	**0.884**
S SCORE ->FP	-0.862	-0.835	**0.497**	**1.734**	**0.084**

4. Results and Discussion

Results indicated that ESG factors influenced the financial performance of the study. Two variables, such as ESG score and ESG Controversies,significantly influenced the financial performance of any listed BRICS countries. Individual scores of Environment (E), Social(S) and Governance(G) have no significant impact on the financial performance in terms of Returns on Sales (RoS).Even Profit-to-Book value, though it is an economic variable, it is not show any significant impact on ESG influence on financial performance for BRICS listed companies. Even the Combined score of ESG does not significantly influence the financial

performance and ESG scores. This may be due to a company's exposure to long-term environmental, social, and governance risks often overlooked during traditional financial analysis. The ESG Controversy Category Score is calculated based on 23 ESG controversy topics and measures a company's exposure to environmental, social,and governance controversies and negative events reflected in global media. Therefore, the Controversy ESG score and Combined ESG score had an impact on attainingthe financial advantage of BRICS-listed companies.

5. Managerial Implications

ESG information benefits investors,companies,the government, and all other society stakeholders due to its significant role in financial performance. The social responsibility/ESG is not only the responsibility of the public sector but also the social responsibility of the private companies, irrespective of their scale of operations. Recently, Corporate Social Responsibility has been renamed Environment, Social, and Governance variables to provide information to investors. Firm investors, managers, and other stakeholders had a significant role in increasing the firm's value. By investing ESG components into the managerial strategies of the firm, a firm can reduce risk. This study investigated the influence of ESG on the financial performance of the BRICS firms. It was found thatESG scores and ESG Controversies are significant factors for an active investor in the global market. As known, the world has become a global village, and each company may focus on the three variables as Environment, Social, and Governance factors together for the financial benefit ofthe individual investor, retail investor, corporate companies, government, and society.

6. Justification of level of significance

Justification of Hypothesis at 90% and 95% level significance	95% Significance	90% Significance	Accepted / Rejected
H1: The social factor does not have any significant impact on financial performance.	Nil	0.084	Accepted
H2: A positive relationship exists between governance and a firm's financial performance.	0.105	Nil	Rejected
H3: Environment does not significantly impact a firm's performance.	0.232	Nil	Rejected
H4: Controversies do not have any significant impact on ESG	0.026	Nil	Accepted
H5: Controversies negatively influence a firm's financial performance.	Nil	0.073	Accepted
H6: Profit-to-Book value has no significant effect on the firm's financial performance.	0.084	Nil	Rejected
H7: ESG positively influences the financial performance of a firm.	0.033	Nil	Accepted
H8: Combined ESG positively influences a firm's financial performance.	Nil	0.064	Accepted

From the above table,at a 95 percent level of significance, the variables like the social factor had a significant impact on financial performance and the Combined ESG hada positive

influence on a firm's financial performance. From the above table,at a 90 percent level of significance, the variables like the social factor had a significant impact on financial performance. Controversies had a negative influence on a firm's financial performanceand the Combined ESG had a positive influence on the firm's financial performance.

7. Conclusion

This study finally derived a model establishing a relationship between ESG and the financial performance of listed companies of BRICS. The ESG variables help to contribute to Sustainable Development Goals (SDGs) in any economy. The proposed model of the study emphasises focusing on ESG Score and Controversies to improve the financial performance of the selected sample. Hence, this study is a proven model that investing in ESG companies influences the respective sample's return on sales (FP). Further, studies may be conducted on sustainable investing because sustainable investing is more about the long-term influence on ESG issues, which in turn responds to the financial performance and returns. Thefuture study aims to invest money in areas and businesses that promote positive societal and climate impact, responsible corporate governance, and inclusive policies while taking a long-term view on financial returns for BRICS nations or G-20 Countries or developed economies.

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References

Albuquerque, Rui, Yrjo Koskein, Chendi Zhang (2021), Corporate Social Responsibility and Firm Risk: Theory and Empirical Evidence, Management Science, Vol:65,Issue:10,ISSN:1526-5501

AI-Tuwaijri, S.A., Christensen, T.E.,& Hughes, K.E. (2004).The relations among environmental disclosure , environmental performance, and economic performance: A simultaneous equations approach. Accounting , Organisations and Society , 29(5-6) , 447-471. https://doi.org/10.016/S0361-3682(03)00032-1

Ball, RJ, &Brown, p.(1968). An empirical evaluation of accounting income numbers. Journal of Account Research, 6(2), 102-140.

Baron , R.M., & Kenny , D.A. (1986). The moderator –mediator variable distinction in social psychology research: Conceptual , strategic and statistical considerations. Journal of Personality and social Psychology , 51 , 1173-1182. https://doi.org/10.1037/0022-3514.51.6.1173

Barth, M.E., Beaver, W.H., & Landsman, W.R.(2001). The relevance of the value relevance literature for financial accounting standard setting: Another view , Journal of Accounting and Economics,31(1),33-104. https://doi.org/10.1016/S0165-4101(01)00019-2

Beaver,W.H.,Landsman, W.R., & Wright, C.(1979). The association between unsystematic security terms and the magnitude of earnings forecast error. Journal of Accounting Research, 17, 136-241 https://doi.org/10.2307/2490507

Bernard , V .L., & Stober , T.L. (1989) . The nature and amount of information in cash flows and accruals. The Accounting Review, 64(4),624-652.

Broadstock, D.C., Chan, K., Cheng, L.T.W., & Wang, X. (2021). The role of ESG performance

during times of financial crisis: Evidence from COVID-19 in China. Finance Research Letters, 38, 101716. https://doi.org/10.1016/j.frl.2020.101716

Brooks , D . C., Oikonomou, I. The effects of environmental , social and governance disclosures and performance on firm value : A review of the literature in accounting and finance . Br. Account . Rev. 2018

Chen, J., Hong, H., &Stein, J. C. (2001). Forecasting crashes : Trading volume , past returns, and conditional skewness in stock prices . Journal of Financial Economics, 6(3), 345-381. https://doi.org/10.1016/S0304-405X(01)00066-6

Cochran .P. L., & Wood , R. A. (1984). Corporate social responsibility and financial performance. The Academy of Management Journal, 27(),42-56

Crossref Web of science @ Google Scholar

D .S. Dhaliwal , O.z.,Li, A. Tsang, and Y . G.Yang. "Voluntary non financial disclosure and the cost of equity capital: The imitation of corporate social responsibility reporting," The Accounting Review, vol.86, no.(1),pp.59-100,2011

Drakos, A.A., & Bekiris, F.V., (2010). Corporate performance, managerial ownership and endogeneity: A simultaneous equations analysis for the Athens stock exchange. Research in International Business and Finance, 24(1), 24-38. https://doi.org/10.1016/j.ribaf.209.1.002

Eamhart, D., & Lizal, L. (2007). Does better environmental performance affect revenues, cost or both? Evidence from a transition economy. William Davidson Institute Working paper, No.856. https://doi.org/10.2139/ssrn.969038

Fama, E. F . (1970). Efficient capital markets-a review of theory and empirical work .journal of finance, 25(2), 383-417. https://doi.org/10.2307/2325486

Fatemi, A.,Glaum, M., & Kaiser, S. (2018). ESG performance and firm value. The moderating role of disclosure. Global Finance Journal, 38, 45-64 . https://doi.org/10.1016/j.gfj.2017.03.001

Feldman, G . A (1997). Performance measure congruity and diversity in multi-task principal/agent relations. Accounting Review, 69(3),429-45.

Friede, G.: Busch, T .; Bassen , A . ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. J . Sustain. Finance Invest. 2015, 5 , 210-233 . [CrossRef] Sustainability 2019 , 11, 1738 24 of 26

Galbreath, J. ESG in focus; The Australian evidence. J. Bus 2013,118 ,529-541. [CrossRef]

Gracia, A.S.; Mendes-Da-Silva, W., Orasto, RJ. Corporate Sustainability, Capital Markets, and ESG Performance. In individual Behaviours and Technologies for Financial Innovations; Springer International Publishing AG; Cham, Switzerland,2006; pp.287-309

Gerged, A.M., Beddawela, E., & Cowton, C.J. (2021). Is corporate environmental disclosure associated with firm value? A multicountry study of Gulf Corperation Council firms. Springer International Publishing AG; Cham, Switzerland, 2006; pp.287-309

Hoepner , A., Cojoianu, T ., Ascui, F., Clark, G., & Wojcik, D. (2020).Does the fossil fuel divestment movement impact new oil & gas fundraising . Journal of Economic Geography, 21, 1-33. https://doi.org/10.1093/jeg/lbaa027

Hoepner , A. GF;McMillan, D.G. Research on 'Responsible Investment'; An Influential Literature Analysis Comprising a Rating, Characterisation , Categorisation and Investigation; University of St.Andrews; St . Andrews, UK.2009

Clifford, G.H., C.P., Randall, S.K. & Dennis, P.S. (1999). Were the Good Old Days That Good? Changes in Managerial Stock Ownership Since the Great Depression. Journal of Finance, 54(2), 435-469. https://doi.org/10.1111/0022-1082.00114

Horvathova, E. (2010). Does environmental performance affect financial performance? A

meta-anaysis. Ecological Economics, 70(1), 52-59. https://doi.org/10.1016/j.ecolecon.2010.4.004

Inoue, Y., & Lee, S. (2010). Effects of different dimensions of corporate social responsibility on corporate financial performance in tourism-related industries. Tourism Management, 32(4), 790-804. https://doi.org/10.1016/j.tourman.2010.06.019

Ionescu, G.H., Firoiu, D., Pirvu, R., & Vilag, R.D. (2019). The impact of ESG factors on market value of companies from travel and tourism industry. Technological and Economic Development of Economy, 25(5), 820-849. https://doi.org/10.3846/tede.2019.10294

Landi, G., Sciarelli, M. (2018). Towards a more ethical market: The impact of ESG rating on corporate financial performance. Social Responsibility Journal, 15(1), 11-27. https://doi.org/10.1108/SRJ-11-2017-0254

De Silva Lokuwaduge, C.S. & Heenetigala, K. (2017). Integrating Environmental, Social and Governance (ESG) Disclosure for a Sustainable Development: An Australian Study. Business Strategy and the Environment, 26(4), 438-450. https://doi.org/10.1002/bse.1927

Peiro-Signes, A., Segarra-oria, M., Mondejar-Jimenez, J., Vargas-Vargas, M. (2013) Influence of the environmental, social, and corporate governance ratings on the economic performance of companies: An overview. International Journal of Environmental Research,7(1), 105-12. DOI: 10.22059/IJER.2012.590.

Morrison, R. (2021). Environmental, Social, and Governance Theory; Defusing a Major Threat to Shareholder Rights. https://cei.org/wp-content/uploads/2021/05/Richard-Morrison-ESG-Theory.pdf

Albuquerque, R., Durnev, A., Koskinen, Y. (2018). Corporate Social Responsibility and Firm Risk: Theory and Empirical Evidence. Management Science, 65(10), 1-19. DOI:10.2139/ssrn.1961971

Wang, J., Song, L., & Yao, S. (2013). The Determinants of Corporate Social Responsibility Disclosure: Evidence From China. Journal of Applied Business Research, 29(6), 1833–1848. https://doi.org/10.19030/jabr.v29i6.8220.

Shaukat, A., Qiu, Y. & Trojanowski, G. (2016). Board Attributes, Corporate Social Responsibility Strategy, and Corporate Environmental and Social Performance, Journal of Business Ethics, 135(3), 569-585. DOI: 10.1007/s10551-014-2460-9

Whelan, T. Atz, U., Van Holt, T., Clark, C. (2021). ESG and Financial Performance: Uncovering the Relationship by Aggregating Evidence from 1,000 plus studies published between 2015-2020. https://www.stern.nyu.edu/sites/default/files/assets/documents/NYU-RAM_ESG-Paper_2021%20Rev_0.pdf

Velte, P. (2017). Does ESG performance have an impact on financial performance? Evidence from Germany. Journal of Global Responsibility, 8(2),169-178. https://doi.org/10.1108/JGR-11-2016-0029

Luo, X., Bhattacharya, C.B. (2008). The Debate over Doing Good: Corporate Social Performance, Strategic Marketing Levers, and Firm-Idiosyncratic Risk," Journal of Marketing, 73(96), 198-213. https://doi.org/10.1509/jmkg.73.6.198

J.P. Morgan (2020). Why COVID-19 Could Prove to be a Major Turning Point for ESG Investing. https://www.jpmorgan.com/insights/research/covid-19-esg-investing

Cardillo, G., Bendinelli, E., & Torluccio, G. (2022). COVID-19, ESG investing, and the resilience of more sustainable stocks: Evidence from European firms. Business Strategy and the Environment. https://doi.org/10.1002/bse.3163

https:// onlinelibrary.wiley.com/doi.org/10.1002/bse.3163

Geva, A. (2008). Three models of corporate social responsibility: Interrelationships between

theory, research, and practice. Business and society review, 113(1), 1-41.
https://doi.org/10.1111/j.1467-8594.2008.00311.x
Mardini, G. H. (2022). ESG factors and corporate financial performance. International Journal of Managerial and Financial Accounting, 14(3), 247-264.
https://www.inderscienceonline.com/doi/pdf/10.1504/IJMFA.2022.123895
Kim S, Li Z. Understanding the Impact of ESG Practices in Corporate Finance. *Sustainability*. 2021; 13(7):3746.
https://doi.org/10.3390/su13073746
Gompers, P., Ishii, J., & Metrick, A. (2003). Corporate governance and equity prices. The quarterly journal of economics, 118(1), 107-156.
https://www.jstor.org/stable/25053900

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Depiction of Children in Ruskin Bond's Short Stories

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Abstract
Ruskin bond, an iconic children's author in Indian literature; for his diverse work in literature, he was conferred with Padma Shri Award in 1999. When a little boy was going through a series of events like loneliness and failure of family bonding, writing became his only way of catharsis. Even though life has given him thousands of bitterness, he somehow was able to see the light at the end of a dark tunnel. His optimism towards life has given him the strength amidst his loneliness and isolation. Having been born to Anglo-Indian parents, Bond found a home in the lap of Himalayas, and he also said that his love for India comes from the deep core of his heart. It is the atmosphere of the Himalayas that fulfils his soul and makes him able to give an imaginary vision. The remarkable blending of the literary traditions of Indian and English literature is noticeable feature of Bond's creativity. He is living in Mussoorie for last 5 decades. Since then he has been ceaselessly jotting down with his pen the inexhaustible mysteries of life in a sizeable canon of his creative literature. In his writings, he focuses the individuality of children, their dreams and their adventures like English children's writing. He captures the innocence of children in his fiction like Indian authors.

Key words: Iconic, catharsis, optimism, imaginary, blending, decades

Introduction:

Ruskin Bond, the name is an amalgamation of mountains, nature, rain, people, emotion, Indian customs and rituals, God, and Indian festivals. He paid a visit to every alley to make his work rich for his readers and found hope and life everywhere. We get numerous works where he mentioned about Indian customs and rituals of North India. He has profound knowledge when it comes to Indian culture and community, and he also said the dark side of it as well. We find all the details from the dressing style of Indian women from the pre-independent era to post-independence. His literary work is not devoid of Indian festivals like Holi. In his first novel, 'The Room on the Roof,' he mentioned the north Indian festival Holi. Besides that, he also mentioned festivals like Janmashtami. He even did not step back to saying the Indian Gods while writing. He portrays Indian Gods by mentioning their importance in human lives.

He depicted God with metaphor in many of his writings. While describing the colonial period, he mentioned the presence of Sadhus and snake charmers. Due to his love and knowledge for the country made him no less than any Indian writer. On his journey to literary works, he found simplicity from daily life, his power to see through life enables him to create some magnificent literary works.

Ruskin Bond is considered a pioneer of children literature in India. Ruskin Bond came close to children's literature. Since Ruskin Bond liked his boyhood very much therefore all his children stories whether autobiographical or semi- autobiographical expressed his longing for a happy childhood. Ruskin Bond likes children because they are more frank, open minded and emotional. According to Ruskin Bond two children can become good friends merely by exchanging a piece of marble, a coin, a doll and bangles. Children do not like the restraints put on them by their elders. Ruskin Bond loves children because they are not deceptive. All children love freedom, jumping in pools, climbing on trees, and are always curios to know about their surroundings so Ruskin Bond is

more close to children of the world.

Ruskin Bond portrays children as frank, open minded and emotional. In his stories children are innocent, love freedom and environment and are always curious to know about their surroundings. Ruskin Bond's portrayal of children may seem naïve by today's literature.

The stories like '*The Angry River'* and '*The Blue Umbrella'* brilliantly amalgamate the traditions of Indian and English Children's literature. **Sita**, the young heroine of '*The Angry River'* bravely fights the destructive forces of nature. Binya, the vivacious girl of "The Blue Umbrella" successfully overcomes the self-seeking attitude towards life. The readers are motivated in witnessing the indomitable spirit of both the heroines, Sita and Binya, as they fight the external and internal forces of life.

Bond's acumen could well be observed in his projection of life-like children. His child protagonists appeal enormously for their love, adventures and inquisitiveness to know the things around them. They pester the adults, at time their friends, with unending and mind boggling questions. They frequently tell lies which are invented truths of their imagination, tease each other, befriend again forgetting the scuffle of one minute before and show concern for peer interests.

The child characters of Bond act and behave as the children do in any part of the world. In their appearance and attire, Bond's children could differ from the children of the world but not in their attitude and temperament. If Tom Sawyer of Mark Twain steals jam from a pot in the Adventures of Tom Sawyer, Ranji, Koki and Teju of Bond steal guavas in the story "When Guavas are Ripe." Tom befools Aunt Polly and so do these three children play tricks on Gopal, the watchman of the guava orchard. Aunt Polly punishes Tom by asking him to whitewash the fence. Tom shows excessive interest and indulgence in whitewashing with the intention to allure his friends to complete his work. His trick works. The gullible friends of Tom not only whitewashed the fence but also enriched Tom by gifts for allowing them whitewashing. Teju, Koki and Ranji flatter Gopal, an ex-wrestler and the keeper of an orchard. They praise his prowess and physique and listen to dull stores of his bravery with the sole interest of procuring guavas in return. The old and lonely Gopal was immensely impressed by children's flattery. He treated them with the grand feast of guavas from his orchard. Tom and Huck love adventures. They enjoy hunting and fishing and go for expedition to Jackson's Island. Laurie, Anil and Kamal of *The Hidden Pool* enjoy themselves the secrete pool on the mountain site. At the pool they fish, build dams, take midnight dips, wrestle and ride buffaloes. They go for trekking up to Pindari Glacier at 12,000 feet above sea level, where no one from their town has gone before. Rusty in *The Room on the Roof* runs away from his apathetic and strict guardian, Kishen in Vagrants in the Valley from his drunken father, Daljit and Rusty from school. Thus Bond children follow the trend of running away from home or work like Oliver Twist, David Copperfield, Kim and Huckleberry Finn.

In *The Last Tonga Ride* the child narrator enjoys the company of a tonga-driver, Bansi Lal. He feels rejuvenated and much more important on being called dost (friend) and enjoys his raised status: "He did not call me 'chota sahib', or 'baba,' 'but dost' and this made me feel much more important. Not every small boy could boast of a tonga driver for his friend!"[22] . The boy loves the thrill of free tonga ride with Bansi. He accompanies him even though being scolded by his granny and ayah.

Bond presents two kinds of adult characters: one who acts as possible catalyst and the other who creates hindrance. In general, the adults in Bond's stories are considerate and contact with them exposes children to new vista and a better perspective. They love and rescue innocent and naïve kids from troubles like the fairy Godmother of Cinderella. The good natured strange woman who gives treat to a lonely child in *The Woman on Platform No. 8,* caring Aunt Mariam who takes care of an orphan nephew, in *The Thief* are thoughtful adults who by their positive attitude and loving approach take care of the children and guide them during trouble. They receive deep reverence of children. They pass on their wisdom to children and enable them to gain confidence and assume responsibilities. The invigorating relationship of children with adults paves the way toward happy selfhood.

The story *A Guardian Angel* invokes the loving bond between an aunt and her six-year-old orphan nephew. Aunt Mariam assures the child by her warmth, worldliness and carefree chatter when his mother passes away. The child enjoys on enjoys on being called ladla (dear) by her. Mariam is an

outcaste for her family because of bringing disgrace to it by becoming a mistress but for the child, she is an angel. The child is unable to understand why his mother was cold and indifferent towards such a friendly and cheerful person, Aunt Mariam. It is only Mariam who comes to rescue the child with great readiness when his mother dies. Her tenderness and selfless approach fills the void in the life of the child. The boy characteristically recalls her personality. For him, she was a "joyous, bubbling creature – a force of nature rather than a woman – and every time I think of her I am tempted to put down on paper some aspect of her conversation, or gestures, or her magnificent physique"

The story *Getting Granny's Glasses* focuses on the attachment between a grandmother and his grandson Mani. Mani offers to accompany his grandmother on a two-day journey to Mussoorie where the nearest eye hospital is located, so that she can get a new pair of glasses. The atmosphere of this Himalayan region during monsoon is charmingly described as the two set off on their adventure. They walk through field and forests, up and down mountains, see a river rushing swiftly, pass a mule-driver singing a romantic song and admire a flock of parrots and the hills. The glasses renew Granny's zest for life. She buys gifts for the whole family, including a bell for the cow. With her improved vision, Granny excitedly rediscovers the beauty of her surrounding but her greatest joy is seeing what a fine boy Mani has grown up to be.

Majority of adult characters of Bond are portrayed in positive vein. But still there are some characters like Mr. Harrison, the strict guardian of Rusty, drunkard Mr. Kapoor, indifferent towards the need of his son and caring wife, in *The Room on the Roof*; Mrs. Bhushan a nosey and overbearing lady in Vagrants in the Valley; Satish mother a domineering and imposing lady in *The Woman on the Platform no. 8*. The adolescent characters are shown in clashes with adults. They defy the authority and break the conventional rules. Adolescence is a period in one's life when one becomes very sensitive and opposes protractions, rules and codes of conduct which one cannot absorb. Rusty in *Room on the Roof* rebels against the restriction of his guardian Mr. Harrison. He defied the rigid social codes of the English which do not allow him to mix with the natives. Harrison beats him for playing Holi (an Indian festival) with his friends. Rusty repulses the attack of his guardian, beats him on the rebound and runs away.

Ruskin Bond had published many casual short stories for children in magazines and newspapers in India and abroad, but he started to write regularly for children when he uprooted himself from Delhi to Mussorie. After moving to Ivy Cottage, as a grandfather to Prem Singh's children he is constantly writing children stories, to amuse his adopted grandchildren, Rakesh, Mukesh, and Savitri. Through writing children's stories he also fulfilled his own unfulfilled wishes and longings as a child. He writes in *Scenes from a Writer's Life* that *"I don't suppose I would have written so much about childhood or even about other children if my own childhood had been all happiness and light"*.

Ruskin Bond got success as a writer for adults, and then he became interested in writing stories about children. In his introduction to *The Night Train at Deoli and other Stories* he writes that in the 1970s, when he was facing all kind of problems, his stories relating to children coped with the difficult situation. Earlier he had written a few stories for children and published in magazines and newspapers in India and abroad, but while in Mussorie, after shifting to his new home, Ivy Cottage he started writing more frequently for children as he played the role of grandfather to Prem Singh's children. He was always thinking of new stories to tell Rakesh, Mukesh and Savitri. His innovation was to make children protagonist in his stories. Also these stories satisfied his own urge and desire to write about his lost childhood. He writes in 'Scenes from a Writer's Life' to the following effect:

"I don't suppose I have written so much about children if my own childhood had been all happiness and light. I do not find that those who have contended, normal childhood, seldom remember much about them; nor do they have much insight into the world of childhood".

CONCLUSION:

Fortunately, his trauma was channelized toward children's classics, which gave an outlet to his own agonies. Ruskin Bond found a resemblance with David Copperfield who sustained himself in an unfriendly world. The thought that children are rarely given attention by their elders, made him more sympathetic towards them. The children he came across in villages, their everyday experiences suggested themes for his stories. Ruskin Bond always enjoyed their company. Ruskin Bond's children stories can be put into two categories: "personal and impersonal ones". Personal stories are

autobiographical or semi- autobiographical in tone, where he records his own reflections, unfulfilled passions and small adventures. These are stories like “My Father’s Trees in Dehra”, The Funeral, When I can’t Climb Anymore, The Tiger in the House, The Playing Fields of Shimla, Life with Uncle Ken, the Cherry Tree, The Last Tonga Ride, Coming Home to Dehra, All Creatures Great And Small, The Tree Lover. These stories show young Ruskin Bond’s affinity with trees and pets and his love for the town, Dehra. He was deeply attached to the places where he spent his childhood; hence his stories are nostalgic and vivid bringing to life and charming little places, colonial bungalows and fruit laden orchards where he wandered about as a boy. His stories for children reflect his rich imagination.

Bond’s love for children and his dual British and Indian heritage lend depth to his writing. He selects his style and subjects with the child reader in mind. His first person narrative helps the young audience to identify easily with the narrator child. He displays a fresh outlook while projecting he world of children, their dreams and high spiritedness. He has consolidated the notion of the child as cherished and valued members of the society who has his own aspirations to follow and dreams to pursue. Bond has the uncanny capacity of going straight into the heart of reader and unveiling the layers of childhood – universal in its romanticism. His stories have marked the trail for the future writers.

The cultural code and family matrix of Indian and western society differ entirely. Hence literature, a replica of the milieu in which it is created, is bound to differ. Commenting on the difference between the attitudes of an Indian writer in relation to a western one, VrindaNabar points out:

The importance of individualism in distinguishing between the two world outlooks, the Westren and the Indian, cannot be undermined. In spite of a marginal literary move in the Indian languages toward the western mood canon in this respect, both Indian literature and culture have remained largely impervious to its message.

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References:

1. *"Can't Run Out Of Stories In India": Ruskin Bond Celebrates 88th Birthday". NDTV.*
2. ^ *"Padma Awards" (PDF). Ministry of Home Affairs, Government of India. 2015. Retrieved 21 July 2015.*
3. ^ Jump up to: *Khorana, Meena G. (2003). The Life and Works of Ruskin Bond. Praegar, Greenwood. p. 1–10. ISBN 9780313311857.*
4. ^ *Pant, Neha (19 May 2015). "At 81, Ruskin Bond's tryst with his tireless pen continues". Hindustan Times. Retrieved 22 October 2015.*
5. ^ Jump up to: *Mishra, PrachiRaturi (19 May 2014). "The name is Bond, Ruskin Bond". Hindustan Times. Retrieved 21 October 2015.*
6. ^ *Sinha, Arpita (18 May 2010). "The name is Bond, Ruskin Bond". Archived from the original on 7 October 2011. Retrieved 3 March 2011.*
7. ^ *Bond, Ruskin (24 November 2012). "Walk the Talk with Ruskin Bond" (Interview). Interviewed by Shekhar Gupta. Delhi: NDTV. Retrieved 18 July 2013.*
8. ^ *Dhir, L. Aruna (2 April 2018). "The interview that Ruskin Bond called his finest". DailyO.in. Retrieved 13 January 2020.*
9. ^ Jump up to: *Kumar, Ramendra (10 December 2010). "A Landour day with Ruskin Bond". Business Line. The Hindu. Archived from the original on 8 January 2016. Retrieved 20 October 2015.*
10. ^ *Zachariah, Preeti (2 December 2019). "How Ruskin Bond keeps the magic of boyhood alive". The Hindu. ISSN 0971-751X. Retrieved 13 January 2020. Though 'Children's Author' is a tag that he is usually associated with, Bond began writing for children only in his forties. "I was always good at writing about children. But I wrote those stories without a reader in mind",*
11. ^ *"My writings reflect my lonely childhood: Ruskin Bond – Firstpost". Firstpost. 9 April 2014. Retrieved 22 October 2015.*
12. ^ *Bond, Ruskin (29 August 2017). Scenes from a Writer's Life. Penguin UK. ISBN 978-81-8475-450-6.*
13. ^ *"Ruskin Bond to do a cameo in 'SaatKhoon..'". The Times of India. IANS. 24 January 2011. Archived from the original on 28 January 2011.*

14. ^ *Adya@Youngbookreporters (21 March 2016). "Room on the Roof by Ruskin Bond – review". The Guardian. ISSN 0261-3077. Retrieved 30 May 2017.*
15. ^ *"The Room on the Roof by Ruskin Bond". The Hindu. 23 April 2013. Retrieved 30 May 2017.*
16. ^ *Singh, Tanaya (3 January 2016). "Ruskin Bond Brings Back Rusty. After More than a Decade". The Better India. Retrieved 30 May 2017.*
17. ^ *"5 popular books by Ruskin Bond you shouldn't miss : Art and Culture". India Today. 18 May 2016. Retrieved 30 May 2017.*
18. Bond, Ruskin. *Panther's Moon and Other Stories.Illus*. SuddhasattwaBasu. New Delhi: Puffin, 1991. pp. 83.
19. Aggarwal, Amita. *Fictional World of Ruskin Bond*. Sarup& Sons, 2005. Print.
20. Bond, Ruskin. The Night Train at Deoli and Other Stories. New Delhi: Penguin Books Pvt. Ltd. 1988. Print.
21. Bond, Ruskin. *The Best of Ruskin Bond.*New Delhi: Penguin Books, India. 1994. Print.
22. Heyman, Michael. The Life and Works of Ruskin Bond. Children's Literature Association Quarterly, vol. 28, 2009, pp. 253-254.
23. Sinha, M., Jauhari, R. and Dave, N. Ruskin Bond: *A Critical Evaluation. 1st ed. New Delhi: Atlantic Publishers. 2012. pp 1*

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THE ROLE OF ICT IN ENGLISH LANGUAGE TEACHING

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ABSTRACT:

The ability to acquire and understand English is now recognized on a global scale because it is regarded as a universal language. English has evolved into a business, academic and most significantly communication tool. We must incorporate ICT (Information and Communication Technology) with present teaching methodologies in order to enhance the entire experience of learning the English language. ICT has been found to be a very effective instrument for educational reform and change. It has been proven to be a great way of improving the teaching and learning process. This is the technology era, and these days even a toddler is familiar with the use of computers and laptops. This is major reason as to why technology has come up with the idea of ICT enabled learning methodology, which could help the children of today's generation in a better way and enhance their skills. We live in the Digital era today, and this is the age of technological learners. These technological learners know well how to use technological tools without any formal instruction as such. Even if they require instruction, they are able to use it. In this paper presentation it has been explained that ICT enabled language learning can help one to improve the efficiency and effectiveness of their learning process.

Keywords: Communication, acquire, efficiency, enhance, incorporate

Information and communication technology, or ICT, is now utilized in almost every aspect of living, including education. Computer technology has become so crucial to schooling that it is now included in the curriculum by the government. Language learning has lately begun to make significant progress thanks to the use of ICT in education. It has been used from preschool through university and has grown to be a significant problem in the field of education. It could aid both students and teachers in the process of teaching and learning. ICT has received attention as one of the most potent enablers of educational change and transformation. The use of ICTs has changed the pace of teaching strategies to fit the objectives of a teacher's materials and the needs of his students, even though a successful EFL teacher is not necessary limited to one approach or another. English language teachers now favour communicative teaching and learning over traditional ELT approaches that prioritise the teacher-centered strategy and undervalue the communication skills of the students. The learner's memory is primarily relied upon in the teacher-centered method, and the genuine use of language was unimportant. The students, on the other hand, have

numerous chances to practice their English both inside and outside of the classroom thanks to ICTs. Modern technologies give them the freedom and opportunity to comprehend, consider, and analyse what they have been exposed to. These students interact and speak with others primarily through electronic channels like email, the internet, etc. Electronic tools have become a vital part of their everyday lives because they are the primary source of information for them.

Computers are an important part of the learning process, particularly when acquiring a language. As stated by Hartoyo (2008) in his book, a computer is an instrument and medium that aids individuals in learning a language, though the success of the learning process is entirely dependent on the users. This generation's technology has advanced in terms of both quality and effectiveness. Without any restrictions, they are moving quickly with every offering. The need for technological innovation has sped up the development of technological applications in education and learning as well as the revolution in communication. According to Hartoyo (2008), the pursuit of the "one best method" for teaching English has had an impact on the way the language is taught. The efforts of the teaching profession have been shaped by a desire to find "a" better way to teach students, regardless of whether the focus of instruction has been reading, the grammatical rules and vocabulary of the target language (e.g. Grammar Translation Method), speaking (how to communicate in the target language), or other issues (e.g. The Total Physical Response Method).

Furthermore, the ICTs present a strong foundation for effective instruction. To develop effective teaching techniques that will improve the process of learning the English language, we now need to use modern technologies in a better blended way of delivery. Because they assist students in learning a language that has been specifically created to achieve predetermined objectives, ICTs are extremely inspiring.

There are many more advantages to using ICT as a tool for language acquisition in a classroom. It provides motivation to complete duties that students might otherwise put off. The students in an ICT-enabled language learning class would perform the activities on the computer software platform without any hesitation or inhibition. It would add interest to monotonous chores and have content that could be in multimedia formats. Instead of being an instructor, the job of the teacher will now be a coordinator. With the aid of ICT-enabled English Language Teaching, a methodology of autonomous, self-paced learning is being promoted.

Without the use of information and communication technology, schooling today is unimaginable. It has facilitated the sharing of views, ideas, experiences, and feelings. Many people can receive both education and training concurrently and at a low cost with the aid of ICT. Today, ICT is used in every facet of schooling. Utilizing computers, the Internet, television, radio, projectors, mobile phones, e-mail, online audio and video conferencing, as well as new apps, has made teaching, learning, and training appealing and practical. Saving time, energy, and money are additional benefits. We can therefore conclude that ICT is playing the most significant and crucial part in the teaching and learning process. Consequently, it is also essential to learning.

The modern era is referred to as the "epoch of knowledge explosion." The development of science and technology has made this growth possible. Every element of human existence has

been impacted by science and technology. The use of science and technology in communication has fundamentally altered the course of history. ICT (Information and Communication technology) has grown as a result of the application of modern technological instruments. Agriculture, fashion creation, textiles, games and sports, transportation, education, and health are just a few of the industries that now use ICT. Thanks to ICT, we can share a lot of knowledge from all over the world with just one click.

The changing methodology: the new roles of language teachers

Teachers typically teach facts from books when using conventional language teaching methodologies. The students view their instructors as being their primary source of information. On the other hand, the new educational approaches put the emphasis on imparting knowledge of how to select the information that is necessary. The instructors' responsibilities are to act as mentors or facilitators in order to help students become proficient in choosing, accessing, evaluating, organizing, and storing information. To manage massive amounts of knowledge, these strategies are crucial. Along with managing time and classes, teachers must also build knowledge on their own in online learning groups. The teacher not only fills this new position but also inspires students throughout the entire learning process and can lead stimulating group discussions. The teacher not only plays this new position but also inspires students to learn and can lead stimulating group discussions. The teacher must critically consider the students, the methods (which differ from those used in the classroom), the students' needs, their own computer literacy (hardware, software, and technical support needed), and other issues relating to digital literature. The context of learning must be considered as well, as it is mediated by technology. The benefits of online education are numerous. Up-to-date information is available on the Internet. It can simply and quickly retrieve the enormous amount of data that is stored there.It offers text in real language for language learning purposes instead of the artificial language most books use. With the aid of technology, the instructor can impart more knowledge to more students in less time. To create a learning atmosphere that will broaden students' perspectives, educators must contribute. Zepp (2005) emphasises that instructors should link educational objectives to efficient ICT use. In other words, teachers need to be conscious of how technology is affecting education and the necessary adjustments to improve their instruction. In order to fit into this new ICT environment, they must modify their instructional methodology. In an ICT environment, a teacher's job is to facilitate learning rather than to impart information. This switch from the previous to the new method of knowledge delivery is a universal occurrence.

Advantages and Disadvantages of Using ICT in language classes:

The computer is a device, not a process, to begin with. In some respects, the world of online communication is like books, print, or libraries; it is a vast new medium. Whether using a book or a library is helpful for language learning has never been the subject of study, as far as we are aware. It is also pointless to try and draw comparable broad conclusions about how the Internet or computers affect society. The second and most significant point is that modern communications technologies are a part of the larger ecological context of living at the turn of the century. A large portion of what we read, write, and communicate now occurs on screens instead of in other media like paper or telephone. Instead of teaching foreign language learners to write essays and read magazine articles as we did a generation ago, we

now need to teach them how to compose emails and do online research. This insight led to a method that emphasises the value of new information technologies as valid communication mediums in and of themselves, as opposed to just being tools for instruction. In conclusion, the benefits of utilising new technologies in language instruction can only be understood in light of the evolving objectives of language education as well as the shifting circumstances in post-industrial society. Today's language teachers focus more on assisting students in becoming apprentices in new discourse communities than on merely (or even primarily) imparting grammar principles to them.This is achieved by giving students the resources for their own social, cultural, and linguistic exploration, and by offering chances for genuine and meaningful interaction both inside and outside the classroom. The computer is an effective tool for this process because it gives students access to online platforms for foreign communication. We can better prepare students for the types of international cross-cultural interactions that are increasingly necessary for success in academic, professional, or personal life by utilizing new tools in the language classroom.

Some of the important ICT tools and applications used in the field of English Language:

Social Media: Social media is now a crucial instrument for communication. It offers a forum for exchanging views. It is used to create blogs. Students can join the English language study groups and benefit from information sharing by adding themselves. It offers access to numerous social media platforms, including Facebook, Twitter, Instagram, and others. Learning situational English is greatly facilitated by it.

Internet: It is the most significant networking tool. This is the means of all contemporary contact. It has improved the transmission facility's speed, practicality, affordability, and attractiveness. On the internet, there are numerous communication tools accessible.

Computers: The most vital piece of information and communication technology and the foundation of contemporary living are computers. Without the use of computers, all current communication processes are unfeasible. It is useful for gathering, organizing, and preparing data for communication. It supports the growth of speech and listening abilities. It improves hearing and speaking abilities in English.

Television: In addition to providing entertainment, television is also helpful for instruction. It has been found to be extremely motivating as well as useful for acquiring situational language and improving listening skills. Understanding the jargon of the media is made much easier by this. The television programmes may concurrently be beneficial to many students. Such institutions as the Indira Gandhi National Open University and the Maulana Azad National Urdu University, among others, broadcast their instructional programmes on television. It serves as a crucial instrument for audio-visual conferencing. This is how talks and training are broadcast live.

Online facilities for English language learning: For the advancement of language abilities, the internet offers a wealth of online resources. Some of them are e-guidance, e-tutoring, e-teaching, e-journals, e-magazines, e-books, e-library, online training, virtual courses etc.

Feature Films in Teaching English: The education of the English language can use movies. Documentary, instructional, and entertainment-based films are all possible. These have a strong capacity to inspire drive. It produces a learning experience that is incredibly gratifying.

Radio: It is a great tool for rural students' instruction and training. Radio is used to carry out numerous distance learning and open enrolment initiatives. Additionally, it helps with audio meetings. Radio programs, particularly dialogues and dramas, are beneficial for the development of language skills.

Projector: A projector is a crucial tool for simultaneously showing procedures and information to many people. It can be applied to staff training and education. Prepared forms of information are simple to display with the aid of overhead projector.

Conclusion: The growth of teachers' careers is aided by ICT. With the aid of information and communication tools, a teacher can pick up a variety of linguistic abilities. He is able to enrol in a variety of certification courses for teaching English as a second language offered by renowned universities like Cambridge University and the British Council, among others. These tools assist in improving his ability to instruct English as well as in making his subject matter simple, affordable, and easier to comprehend. The use of e-journals, e-magazines, and e-libraries, which are only possible with the aid of ICT, can help an instructor broaden the scope of his knowledge of the English language. Through audio and video conferencing, he can also take part in conversations and conferences with the subject matter experts in his field of English language instruction, which will help him to advance his knowledge and abilities in ELT.The use of ICT also aids in the curriculum-design for learning English. To learn about the advantages and disadvantages, difficulties, and sociological and psychological problems relating to English language learners, he can examine the ELT curricula of various nations. He uses all of these resources to create a programme that enables him to accomplish the goals and objectives of teaching English. The aforementioned discussions make it abundantly obvious that ICT tools have altered the paradigm of English language teaching and learning. In order to accomplish the goals of English language instruction, it is crucial for a teacher to be knowledgeable about contemporary ICT tools and know how to use them effectively.

REFERENCES:

1. Ahmad, Jameel (2010). Media Technology and English Language Teaching. A.P.H. Publishing corporation page: 1 2. Antony, A. (1993).
2. Teaching of English as a Second Language in India. Prakash book Depot, Bareilly Page: 131, 133, 134.
3. Pramela, K. 2006. Factors affecting the online delivery of English Language courses in a virtual learning environment. Unpublished PhD thesis, University Putra Malaysia.
4. Queiroz, V. 2003 Roles and competencies of online teachers. The Internet TESL Journal. IX (7), July. http://iteslj.org/Articles/QueirozOnlineTeachers.html. (14 November 2005).
5. Warschauer, M. & Healey, D. (1998). Computers and language learning: An overview. Language Teaching, 31: 57-71
6. Zepp, R.A. 2005. Teachers perceptions on the roles on educational technology. Educational Technology & Society. 8 (2): 102-106

7. Munch. (2008) *ELT in India*. URL://www.teachingenglish.org.uk downloaded on 3/26/2011
8. Pathak, P. D. (2005) *Aspects of English Language Teaching in India.* Downloaded on 3/26/2011 from URL://www.contentwriter.in

Spectral studies of Nd^{3+} doped different fluorophosphate glasses for their aptness in laser applications at 1060 nm

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Neodymium doped fluorophosphate (FP:Nd^{3+}) glasses with different chemical compositions (59$NH_4H_2PO_4$+15ZnO +15BaF_2+10X+1·0NdF_3 (X=LiF, NaF, CaF_2, SrF_2, AlF_3)) were prepared by melt quenching. Their structures and spectroscopic properties were studied using x-ray diffraction, FTIR, FT-Raman and ^{31}P, ^{27}Al MAS NMR techniques. Various structural groups were identified using FTIR and FT-Raman spectra. The depolymerisation of metaphosphate chains are described by the decrease of Q^2 tetrahedral sites allowing the formation of pyrophosphate groups revealed by ^{31}P MAS NMR spectroscopic studies. Optical properties were studied using absorption and photoluminescence spectroscopy. Judd–Ofelt intensity parameters Ω_λ (λ=2, 4 and 6) were estimated from absorption spectra. Radiative parameters such as transition probabilities (A), radiative lifetimes (τ_R), integrated absorption cross-sections (Σ) and branching ratios (β_R) were calculated. Two emission lines at 1060 and 1330 nm were observed for Nd^{3+} in all the fluorophosphate glasses. From the emission spectra, emission characteristics were studied via optical band gains ($\sigma_e \times \tau_R$) and gain bandwidths ($\sigma_e \times \Delta\lambda_{eff}$). Fairly large numerical values for peak emission cross-sections (σ_e) and branching ratios (β) for $^4F_{3/2} \rightarrow {}^4I_{11/2}$ transition of Nd^{3+} ion doped calcium fluorophosphate glass were observed. These results are rosy for NIR laser application at 1060 nm.

1. Introduction

Glasses are a boon to humanity. They give a lot of leverage to experimenters due to their lack of long range order. Their properties are isotropic; they can be doped with rare earth elements to high degrees of concentration with excellent homogeneity. Glasses can be made into a wide variety of sizes and shape. Rare earth element doped glasses have been meeting the requirements of mankind upon their probing by inquisitive minds. Ever since the invention of laser action in neodymium doped glasses by Snitzer in the 1960s, commendable research activity was done on the spectroscopic and laser properties of lanthanides in general and neodymium in particular. Trivalent neodymium (Nd^{3+}) is central to laser action in different hosts, both crystalline as well as amorphous. Due to its ability to produce strong infrared fluorescence radiation, this ion is a good contender for research in high power (of order 10^{12} W) laser applications, optical amplifiers and fibre amplifiers in broadband telecommunications, storage and Faraday rotators.[1–6]

There are many ways in which the stimulated emission characteristics of trivalent rare earth ions can be affected by the surrounding host glass matrix.[7–8] The surrounding ligand field perceptibly impacts the optical absorption cross-section, stimulated emission cross-section, fluorescence decay and other laser parameters. For practical applications, like laser amplifiers, it is crucial that nonradiative processes, such as multiphonon relaxation, are minimised to ensure high yield. Phosphate glasses have many advantages over silicates, borates and fluorides. Addition of fluorides to the phosphates pave the way for the reduction of OH absorption by forming HF.[8] This results in low phonon energy.[9–11] Fluorophosphates have many favourable qualities such as minimal dispersion, good rare earth ion dispersal homogeneity and high emission cross section.[12–13] ZnO is a well-known glass former, it acts against crystallisation and has a non-hygroscopic nature[14–15]

To understand phosphate glasses, one needs to think of their structures as a polymerisation by tetrahedra, since for most compositions, fortified P–O bonds are present. Structures of phosphate glasses can be characterised as polymeric compounds containing sturdy phosphate tetrahedra and frail O–M–O bonds where M being an alkali positive charge. The sturdy P–O–P bonds connecting the tetrahedra that make up the polymers and the weak M–O bonds binding the polymers can be attributed to large thermal expansion coefficients of these materials.[15] The structure of phosphate glass is understood with [PO_4] tetrahedra. Here two pentavalent phosphorus

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atoms are linked with three oxygen atoms by σ-bonds which are bridging oxygens B–O and one oxygen is bonded to one phosphorus by a $\sigma+d_{\pi}-p_{\pi}$ double bond, i.e terminal oxygen O_T. Neutron diffraction at high resolution was used by Hoppe to determine the bond lengths of the P–O bonds in the $[PO_4]$ tetrahedron. This has enabled a clear separation between the P–O bond lengths having terminal oxygens (1·43 Å) and those of bridging oxygens (1·58 Å).[16]

As fluoride group's vibrational frequencies are lower, rare earth elements doped fluoride glasses have become interesting materials to laser research specialists.[17] Several fluorides derived from alkali and alkaline earths were used in fluorophosphate glasses as network moderators since they prevent devitrification, improve structural properties, and reduce OH-bonds.[18–19] Many studies have been carried out on Nd^{3+} ion spectroscopy in a range of glassy environments, which include phosphate, borate, telluride fluoride, sulphate and chalcogenides.

Recently Meisong Liao[20] highlighted the effect of alkali and alkaline earth fluoride on thermal stability and structure of fluorophosphate glasses. Ghose *et al*[21] studied relaxation in mixed alkali fluoride glasses. Zhao & Sakka[22] reported properties of mixed alkali fluoride glasses in the ZrF_4+PbF_2+AlF_3+*R*F (*R*=Li, Na, K) system. Damodaraiah *et al*[23] investigated the spectral studies of Nd^{3+}doped different bismuth phosphate glasses for laser applications. Vijayalakshmi *et al*[13] studied structural, dielectric and photoluminescence properties of Nd^{3+} doped multifunctional optical glasses for solid state laser applications. Flórez *et al*[24] studied the effect of P_2O_5 on emission properties and in turn laser applications of fluorophosphate glasses. Kumar & Ratnakaram[4] studied the role of TeO_2 coordination on structural and emission properties of Nd^{3+} in fluorophosphate glasses. Rajagukguk *et al*[25] reported optical gain of the same ion. There is enough literature available on the studies of concentration variation of rare earth doped glasses and there by various properties. In the present work, the authors aimed at understanding the effect of composition variation (alkali, alkaline earth and post transition metals) on lasing action of neodymium ion doped phosphate glasses.

2. Experimental

2.1. Glass preparation

A series of five ($59NH_4H_2PO_4$+15ZnO+15BaF_2+10*X* +1·0NdF_3) different fluorophosphate (*X*=LiF, NaF, CaF_2, SrF_2, AlF_3) glass systems were prepared by melt quenching. Analar grade chemicals $NH_4H_2PO_4$, ZnO, BaF_2, LiF, NaF, CaF_2, SrF_2, AlF_3 and NdF_3 of highly purified (99·9%) were used in the glass preparation. The glass compositions each of the 15 g pre-weighed amounts of chemicals were rigorously pulverised in an agate mortar to mix its constituents. After this process the fine powder is taken in a porcelain crucible which can withstand at high temperatures and melted in an electric furnace at a temperature range of 1100–1130°C for an hour. The melted mixture was stirred and allowed to equilibrate by the release of gas bubbles. After homogenisation, the molten chemical was quickly transferred into hot square brass plates to ensure glass formation. After casting, the samples were annealed at 300°C for about 120 min to remove any thermal stress that might exist in the samples. Then the samples were taken to room temperature slowly. The glasses were polished properly for characterisation of their physical and optical measurements. Basing on cation change, the prepared glasses are named as follows:

$59NH_4H_2PO_4$+15ZnO+15BaF_2+10LiF+1·0NdF_3 — LFPNd

$59NH_4H_2PO_4$+15ZnO+15BaF_2+10NaF+1·0NdF_3 — NFPNd

$59NH_4H_2PO_4$+15ZnO+15BaF_2+10CaF_2+1·0NdF_3 — CFPNd

$59NH_4H_2PO_4$+15ZnO+15BaF_2+10SrF_2+1·0NdF_3 — SFPNd

$59NH_4H_2PO_4$+15ZnO+15BaF_2+10AlF_3+1·0NdF_3 — AFPNd

2.2. Measurements and analysis of samples

Mass densities of the synthesised glasses were measured using Archimedes' principle which in fact calculates relative density. Refractive indices (*n*) were estimated by Abbe refractometer. The XRD spectra were recorded on INEL C120X-ray diffractometer using Cu K_α radiation of wavelength 1·79 Å. This instrument scanned the glass samples in the range 2θ with scan rate of 2°/min. The x-ray generator was operated at 40 kV and 20 mA. Absorption phenomenon was performed using JASCO V–570 spectrophotometer. The measured spectral absorptions were normalised using sample thickness *l* (cm) and doping concentration, *C* (mol%). The modified spectra were used for calculation of oscillator

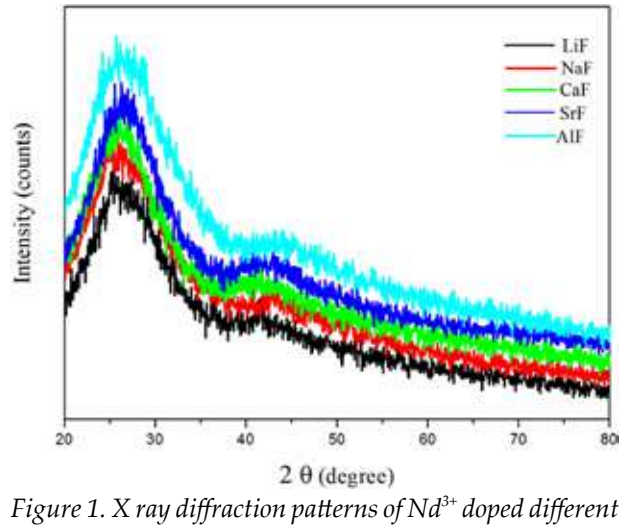

Figure 1. X ray diffraction patterns of Nd^{3+} doped different fluorophosphate glasses [Colour available online]

Table 1. Physical properties of Nd^{3+} doped different fluorophosphate glasses

S. No.	Physical quantity	Glass LFPNd	NFPNd	CFPNd	SFPNd	AFPNd
1	Density, ρ (g/cm^3)	3·378	3·382	3·426	3·599	3·472
2	Refractive index, n	1·646	1·644	1·643	1·641	1·640
3	Molar volume, V_m (cm^3/mol)	32·853	33·290	33·915	33·605	33·635
4	Ion concentration, N_i (10^{22} ions/cm^3)	0·304	0·300	0·294	0·298	0·297
5	Thickness (cm)	0·352	0·358	0·343	0·344	0·370

strengths, intensity parameters Ω_λ, spontaneous emission transition probabilities branching ratios, radiative lifetimes, and peak emission cross-sections. FTIR spectra were obtained using Bruker Alpha-II spectrometer and FT-Raman spectra by Bruker RFS 27: FT-Raman spectrometer (scan range: 200–2200 cm^{-1}, 2 cm^{-1} resolution) to get the structural details. To delve deep into the structural properties, ^{31}P MAS NMR spectra were recorded using JOEL ECX 400 MHz NMR spectrometer.

3. Results and discussion

3.1. XRD

Figure 1 represents XRD patterns of Nd^{3+} doped different fluorophosphate glasses recorded in the range $20° \leq 2\theta \leq 80°$. The lack of any sharp peaks certified the glassy state of the prepared specimens. The glass densities, refractive indices, molar volumes, ion concentrations and thicknesses of Nd^{3+} doped different phosphate glasses of the present investigations are given in Table 1.

3.2. Raman Spectra

FT Raman spectra which give irrefutable evidence about the structural parameters of host glass matrix are shown in Figure 2. The spectra were recorded over 200–2200 cm^{-1} range. Six distinctive bands were noticed at ~338, 502, 710, 1034, 1152 and 1846 cm^{-1}. The band at 338 cm^{-1} is due to F–PO_3 scissoring mode. The band at 502 cm^{-1} is attributed to distortion mode of P–O and P–F vibrations. The band at 710 cm^{-1} is due to $(P–O–P)_{sym}$, stretching. The bands at 1034 cm^{-1} and 1152 cm^{-1} are assigned to balanced stretching of non-bridging oxygen on Q^2 tetrahedron and are also due to $(P–O–P)_{asym}$ characteristic of vibrational movement of phosphate and the motion of cationic polyhedral. Existence of this band shows that various metal cations function as network modification agents in fluorophosphate glass formation. The band at 1152 cm^{-1} is the most intense one for all the glass compositions. Hence we conclude that addition of alkali and alkaline earth fluorides increases the $(P–O–P)_{asym}$ in the glass matrix.

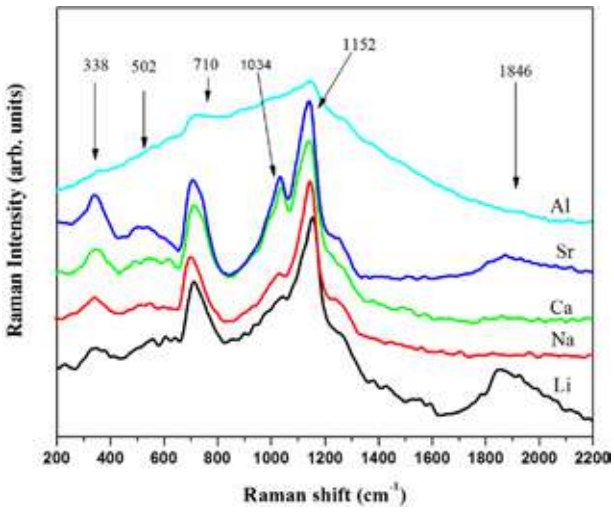

Figure 2. FT-Raman spectra of Nd^{3+} doped different fluorophosphate glasses [Colour available online]

3.3. FTIR Analysis

FTIR spectra of 1·0 mol% Nd^{3+} doped different FP glasses were recorded and shown in Figure 3. The spectra of these glass matrices are studied in the range 500–3500 cm^{-1}. Each spectrum divulged various absorption bands localized at 597, 730, 1065, 1246, 1462, 1608, 1827, 2362 and 3164 cm^{-1}. Based on the comparison between our results and literature data, the following observations were made regarding the attribution of the absorption bands. The band at 597 cm^{-1} was due to bending vibrations of O–P–O linkages. The band at 730 cm^{-1} was identified to be due to symmetry arises due to elongation vibra-

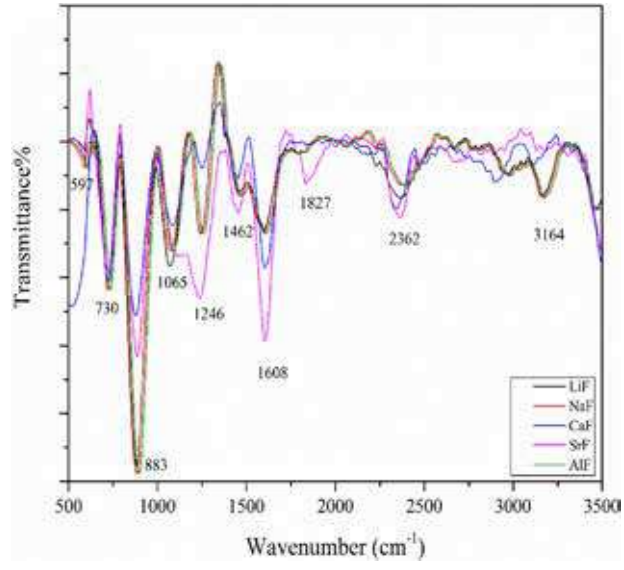

Figure 3. FTIR spectra of Nd^{3+} doped different fluorophosphate glasses [Colour available online]

tions of P–O–P linkages. The band at 1065 cm^{-1} was related to the asymmetric stretching vibrations of P–O–P linkages. The band at 1246 cm^{-1} was due to the asymmetric stretching due to P=O. The bands at 1462 and 1608 cm^{-1} were given to bending vibrations of O–H groups. The band at 1827cm^{-1} was related to H_2O bending vibrations. The band at 2362cm^{-1} was due to hydrogen bonding. Band at 3164 cm^{-1} range is due to fundamental stretching of OH groups.[23–25]

3.4. Magic angle spin nuclear magnetic resonance (MAS NMR) analysis

^{31}P magic angle spinning nuclear magnetic resonance is an indispensable tool to analyse phosphate type glasses. The technique adopted in this process is 'measuring the radio frequency required to excite the nuclei of the sample from one spin quantum state to another in the presence of an external magnetic field'. The fractional differences from the standard values are called shift. This shift is sensitive to even an iota of change in the local chemical composition.[29] This is due to the fact that electrons in the neighbourhood of investigated nucleus shield it by varying degree. ^{31}P NMR study of the glass samples have shown that the degree of polymerisation can be quantified with ^{31}P chemical shift. It paves the way to fathom out the number of phosphorous atoms bound by oxygen bridges to a specific tetrahedron [PO_4].

The phosphate bonding is analysed and understood via Q^n models. Here the superscript *n* stands for the number of bridging oxygens per tetrahedron. Based on the count of bridging oxygens with the adjoining tetrahedra, the classification is made. It is possible to identify three types of tetrahedral models. They are Q^1 – phosphate tetrahedra with one bridging oxygen, Q^2 and Q^3 with two and three bridging oxygens. The crosslinked Q^3 tetrahedron is rudimentary block for the structure of phosphate glass in which the positively charged ions get randomly inserted in to it.[30] However, this situation gets changed with the change of network modifier cations. Q^3 breaks into Q^2 and then further reduces to Q^1 and Q^0 units. These units were usually identified in ^{31}P NMR spectra with a $Q^3 \rightarrow Q^1$ shift. Fluorine anions form nonbridging bonds.

Figure 4 depicts the ^{31}P MAS NMR spectra of fluorophosphates glasses with various alkali, alkaline and post transition metal cations. In the case of Li, Ca and Sr glass matrices, strong signals at −8·74, −9·34 and −8·65 ppm were observed and may be associated with Q^1 polymer like metaphosphate structural units. In the case of Na and Al glass matrices, dominant signals present at −22·825 and −23·69 ppm, respectively, could be assigned to Q^2 tetrahedra units. The unique feature is that except for AFPNd glass, rest of the glass matrices have side shoulders consistently. In the case of LFPNd, CFPNd and SFPNd glasses, the intensity is high for Q^1 whereas for NFPNd glass, the dominant peak is observed at −22·825 ppm with side shoulder at −8·65 ppm. In case of AFPNd glass no such side shoulder is recorded. The ^{27}Al MAS NMR spectra for the glass shows three peaks nearly at +39·3, +7·5, and −16·1 ppm. They were designated to $Al(OP)_4$, $Al(OP)_5$ and $Al(OP)_6$ sites, respectively.[31] This indicates the structural changes in the glass matrix with different cations.

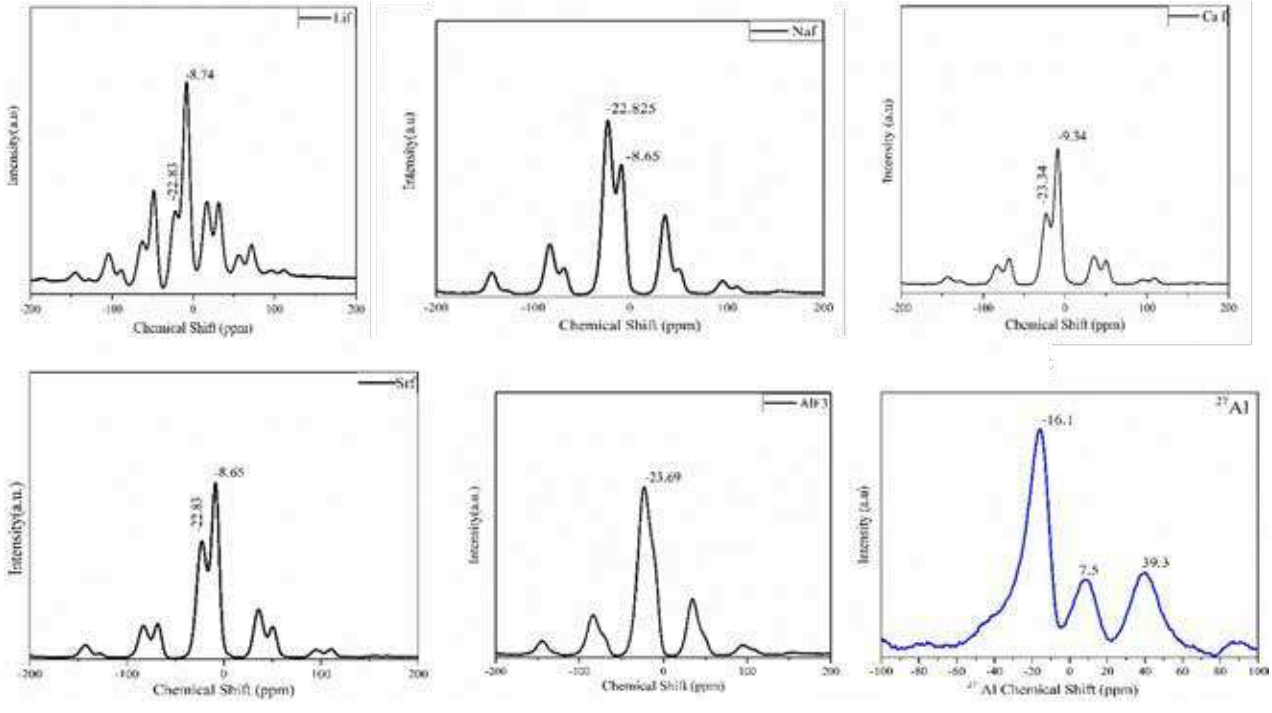

Figure 4. ^{31}P and ^{27}Al MAS NMR spectra of Nd^{3+} doped different fluorophosphate glasses [Colour available online]

3.5. Optical bandgap energy and Urbach energy

The complexity of the behaviour of electrons in disordered structures such as glasses can be obtained with the help of calculation of optical bandgap energies and Urbach tail energies. This knowledge is essential for employing these materials in opto-electronic applications. The variation of absorption coefficient with the variation of photon energy paves the way to identify three distinct regions. The first zone is more or less unvarying due to exciton–phonon close interaction. The second zone is known as Tauc region. It is a region corresponding to high absorption. The optical bandgap calculation is feasible with this region. The last region is in exponential form called Urbach region. The absorption tails and the Urbach energies are related by the expression $\alpha=\alpha_0 \exp(h_v/E_u)$ here α_0 here is constant, is energy possessed by impinging radiation, and refers to the band tail width. Those values give a sign of disorderliness in the material, and any change in those values indicates the formation of defects in the glasses. The localised states produced by these defects in the glass result in decrease in the width of the localised states, which causes the increase in optical bandgaps. The procedure for obtaining the optical bandgaps are taken from elsewhere.[28,29] The direct bandgap energy values which are obtained from $(\alpha h\nu)^2$ versus $(h\nu)$ graphs for different experimental glasses LFPNd, NFPNd, CFPNd, SFPNd and AFPNd are found to be 3·85, 3·79, 4·12, 4·02 and 4·54 eV, respectively. The indirect bandgap energy values which are obtained from $(\alpha h\nu)^{1/2}$ versus $(h\nu)$ graphs for these glasses are found to be 3·42, 3·33, 3·63, 3·53 and 3·47 eV, respectively. It is observed that the direct band gaps are lower in sodium phosphate glass and higher in aluminium phosphate glass. The indirect band gap values are also lower in sodium phosphate glass and higher in calcium phosphate glass. These values are tabulated in Table 2. The graphs showing the variations corresponding to direct and indirect transitions are shown in Figures 5(a) and (b).

Table 2. Direct and indirect band gap energies (eV) of Nd^{3+} doped different phosphate glasses

Glass	*Direct*	*Indirect*	E_U
LFPNd	3·85	3·42	0·43
NFPNd	3·79	3·33	0·46
CFPNd	4·12	3·63	0·49
SFPNd	4·02	3·53	0·49
AFPNd	4·54	3·47	1·07

3.6. Optical absorption spectra and Judd–Ofelt analysis

The absorption spectra of 1·0 mol% Nd^{3+} doped LFPNd, NFPNd, CFPNd, SFPNd, and AFPNd glasses were a group of inhomogeneously broadened bands

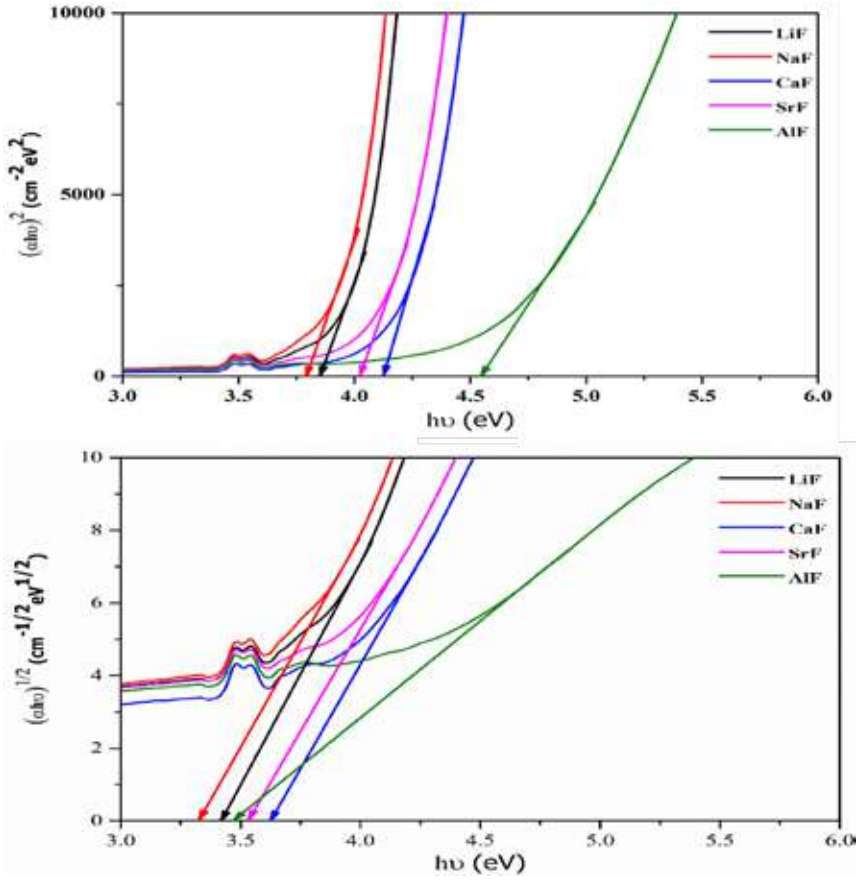

Figure 5. (a) Variation of $(\alpha h\nu)^2$ with $(h\nu)$ and (b) variation of $(\alpha h\nu)^{1/2}$ with $h\nu$ in Nd^{3+} doped different fluorophosphate glasses [Colour available online]

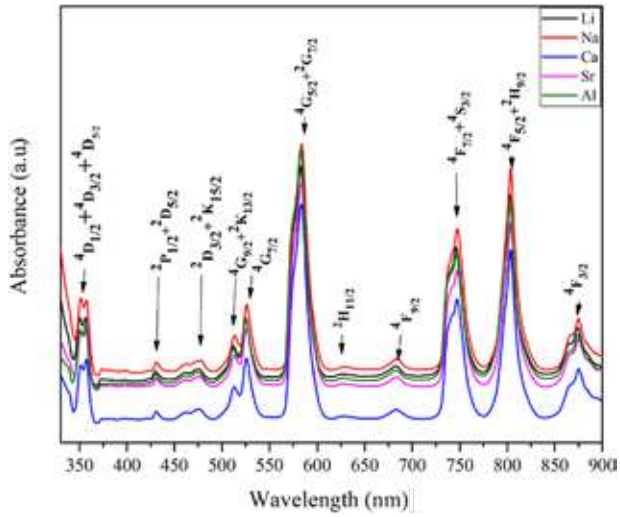

Figure 6. Optical absorption spectra of Nd^{3+} doped different fluorophosphate glasses [Colour available online]

in the UV-VIS and NIR regions which are showing the characteristics of $4f^3$–$4f^3$ transitions pertaining to Nd^{3+}. Absorption spectra of Nd^{3+}-doped various fluorophosphate glasses originate from the ground state $^4I_{9/2}$ to different excited states. In the present work, 11 distinctly different peaks are observed for all the glass matrices The noted spectra were similar for different compositions. However, intensities of individual spectra will vary for different modifier fluorides by its corresponding ligand field and the shapes of spectral peaks of some transitions also change.[34] The absorption peaks are identified as $^4D_{1/2}+^4D_{3/2}+^4D_{5/2}$, $^2P_{1/2}+^2D_{5/2}$, $^2D_{3/2}+^2K_{15/2}$, $^4G_{9/2}+^2K_{13/2}$, $^4G_{7/2}$, $^4G_{5/2}+^2G_{7/2}$, $^2H_{11/2}$, $^4F_{9/2}$, $^4F_{7/2}+^4S_{3/2}$, $^4F_{5/2}+^2H_{9/2}$ and $^4F_{3/2}$ states observed at different wavelengths, 350, 429, 475, 509, 525, 582, 628, 684, 746, 803 and 874 nm, respectively.[35] The recorded absorption spectra of all the Nd^{3+} doped phosphate glasses are shown in Figure 6 along with the spectral transitions. Among all the absorption bands, the band corresponding to the transition $^4I_{9/2}\rightarrow{}^4G_{5/2}+^2G_{7/2}$ shows more intense when compared to other transitions.

The experimental spectral intensities (f_{exp}) of various observed transitions and the calculated spectral intensities (f_{cal}) which are obtained from Judd–Ofelt theory[33–35] are listed in Table 3 along with their rms deviations. It is evident from the table that f_{exp} and f_{cal} values are in reasonable agreement. Among the five glass matrices studied, f_{exp} values are higher in calcium fluorophosphate glass for most of the transitions. Higher spectral intensity indicates lower symmetry around the rare earth ion, strong covalent nature between the ligands. For Nd^{3+} ion $^4I_{9/2}\rightarrow{}^4G_{5/2}+^2G_{7/2}$ is the hypersensitive transition (HST).[36,37] This transition follows the selections rules $\Delta L\leq 2$, $\Delta J\leq 2$ and $\Delta S=0$. It has characteristic of higher values of reduced matrix elements $\|U^{\lambda}\|^2$. The wavelength and the intensity of this transition will be influenced by the surroundings of the doped rare earth ion. The spectral intensities of the hypersensitive transition were observed to be highest in CFPNd glass (24·326) and it is close contender to AFPNd glass (24·25). These values for LFNd, NFNd and SFPNd glasses were 21·718, 23·089 and 22·510, respectively.

In the present work, since HST is prone to the chemical environment around Nd^{3+} with the replacement of modifier fluorides it is observed that, diverse variation of intensity has been found for different glass matrices whereas there is no change in the wavelength. Same trend of divergences have been observed in f_{exp} values and also in Ω_λ (where λ=2, 4 and 6) values which show the divergent magnitudes. This distinction shows the effect of modifier in the ligand field and thereby influencing the spectroscopic properties. The Judd–Ofelt intensity parameters (Ω_λ, where λ=2, 4 and 6) were obtained from the experimental spectral intensities following the standard least square fitting procedure[37,38] and are presented in Table 4. These parameters obtained in the present work are compared with the parameters in other glass matrices in Table 4. Some absorption bands usually consist of a multiplicity of states. This may be attributed to the fact that the crystal field experienced by the doped ions (Nd^{3+}) in glassy material is different for different ions. This is in contrast to the local crystal-field felt by the Nd^{3+} ion in crystalline hosts where it is uniform. This feature leads the inhomogeneous widening of the absorption spectra of RE^{3+} in amorphous media. Due to this fact some

Table 3. Experimental and calculated spectral intensities ($f\times10^{-6}$) of observed absorption bands of Nd^{3+} doped different fluorophosphate glasses

S. No.	Transition from $^4I_{9/2}$	LFPNd		NFPNd		CFPNd		SFPNd		AFPNd	
		f_{exp}	f_{cal}	f_{exp}	f_{cal}	f_{exp}	f_{cal}	f_{exp}	f_{cal}	f_{exp}	f_{cal}
1	$^4D_{1/2}+^4D_{3/2}$	9·114	7·344	8·527	9·080	10·324	9·293	8·961	7·724	7·843	7·301
2	$^2P_{1/2}+^2D_{5/2}$	0·494	0·818	0·887	1·027	0·566	1·067	0·513	0·871	0·547	0·817
3	$^2D_{3/2}+^2K_{15/2}$	1·440	0·749	1·826	0·896	2·046	0·892	1·736	0·765	0·503	0·732
4	$^4G_{9/2}+^2K_{13/2}$	2·608	2·564	3·739	2·951	3·693	2·868	3·519	2·554	2·907	2·516
5	$^4G_{7/2}$	4·762	4·595	6·322	5·410	6·430	5·472	4·429	4·757	4·545	4·724
6	$^4G^{5/2}+^2G_{7/2}$	21·718	21·702	23·089	23·868	24·326	24·467	22·510	22·502	24·250	24·242
7	$^2H_{11/2}$	0·264	0·193	0·138	0·219	0·763	0·205	0·239	0·187	0·193	0·184
8	$^4F_{9/2}$	0·778	0·703	0·609	0·794	0·769	0·739	0·698	0·682	0·514	0·673
9	$^4F_{7/2}+^4S_{3/2}$	8·995	8·903	9·398	9·888	8·972	9·028	8·316	8·497	8·213	8·424
10	$^4F_{5/2}+^2H_{9/2}$	8·813	8·739	9·878	10·038	9·500	9·554	8·778	8·602	8·680	8·417
11	$^4F_{3/2}$	2·162	2·798	2·804	3·434	2·575	3·498	2·191	2·930	2·349	2·770
	δ_{rms}	±0·72			±0·70	±0·82		±0·73		±0·34	

Table 4. Judd–Ofelt intensity parameters (Ω_λ, $\times10^{-20}$ cm^2), spectroscopic quality factors (Ω_4/Ω_6) and their trends in different phosphate glasses

Glass	Ω_2	Ω_4	Ω_6	Ω_4/Ω_6	Trend	Reference
LFPNd	2·719	3·108	3·502	0·89	$\Omega_6>\Omega_4>\Omega_2$	Present work
NFPNd	2·687	3·933	3·864	1·02	$\Omega_4>\Omega_6>\Omega_2$	Present work
CFPNd	2·741	4·111	3·500	1·17	$\Omega_4>\Omega_6>\Omega_2$	Present work
SFPNd	2·783	3·348	3·330	1·00	$\Omega_4>\Omega_6>\Omega_2$	Present work
AFPNd	3·303	3·137	3·316	0·95	$\Omega_6>\Omega_2>\Omega_4$	Present work
Flourophosphate	4·63	2·55	6·79	0·375	$\Omega_6>\Omega_2>\Omega_4$	13
Fluorosilicate	8·14	2·04	2·26	0·90	$\Omega_2>\Omega_6>\Omega_4$	34
Fluorogermanate	5·41	1·89	1·92	0·98	$\Omega_2>\Omega_6>\Omega_4$	34
Chalcogenide	9·2	2·5	1·2	2·083	$\Omega_2>\Omega_4>\Omega_6$	35

bands get superimposed.

Among the three Judd–Ofelt parameters, Ω_2 parameter is a measure of asymmetrical environment around Nd^{3+} ions, Ω_4 and Ω_6 values refer to bulk properties such as rigidity and viscosity. In the present work, it is found that the magnitude of Ω_2 parameter is higher in aluminium phosphate glass. Large value of Ω_2 was due to the moderately higher value of spectral intensity of the hypersensitive transition. It is known that the parameter Ω_2 is a measure of the covalency of the RE–O bond in the glass matrix. Here in the present context, the higher value of Ω_2 in aluminium phosphate glass indicates a strong covalence and a low ionic nature of metal–ligand bond. It can also infer that for AFPNd glass there is less centro-symmetric coordination among the five glasses studied.

In the present work, the Ω_2 values follow the order Al>Sr>Ca>Li>Na (3·303, 2·783, 2·741, 2·719, 2·687) indicating lower value in NFPNd glass and higher value in AFPNd glass. It is also observed that in the present work Ω_2 value is increasing with the increase of valency of constituent elements. In the present work, Ω_4 parameter is higher in calcium phosphate glass ($4·111\times10^{-20}$) indicating higher rigidity of the glass matrix and lower in lithium phosphaste glass ($3·108\times10^{-20}$) indicating lower rigidity of the glass matrix.

3.7. Radiative properties

Radiative properties like effective bandwidths ($\Delta\upsilon$), electric dipole linestrengths (S_{ed}), radiative transition probabilities (A), total radiative transition probabilities (A_T), radiative lifetimes (τ_R) and branching ratios (β) of different Nd^{3+} ion transitions were estimated and are presented in Tables 5 and 6 for all the glass matrices studied. These parameters have been derived using the standard formulae given in Rao *et al*.[43] The network formers and modifiers of the glass matrix will have substantial influence on the radiative properties of rare earth ion, Nd^{3+}. It is pertinent to note here, that the radiative relaxation of an excited state to all its lower levels depends primarily upon radiative transition rates. The radiative lifetimes which are the reciprocals of total radiative transition probabilities, A_T ($T_r=1/A_T$) are calculated and are tabulated in the above tables. It is observed that the order of magnitude of radiative lifetimes for different excited states

Table 5. Effective bandwidths ($\Delta\upsilon_{eff}$, cm^{-1}) electric dipole linestrengths (S_{ed}), radiative transition probabilities (A, s^{-1}), total radiative transition probabilities (A_T, s^{-1}) and branching ratios (β) of different Nd^{3+} doped fluorophosphate glasses

Glass	Transition	Δ_υ	S_{ed}	A_R	β_{cal}	β_{exp}
LFPNd	$^4F_{3/2}\rightarrow{}^4I_{15/2}$	5093·0	9·8	9·5	0·004	-
	$^4F_{3/2}\rightarrow{}^4I_{13/2}$	7318·0	73·3	210·5	0·089	0·154
	$^4F_{3/2}\rightarrow{}^4I_{11/2}$	9425·0	187·2	1148·3	0·487	0·839
	$^4F_{3/2}\rightarrow{}^4I_{9/2}$	11441·0	90·4	992·0	0·420	-
				A_T=2360·3		-
NFPNd	$^4F_{3/2}\rightarrow{}^4I_{15/2}$	5080·8	10·8	10·3	0·004	-
	$^4F_{3/2}\rightarrow{}^4I_{13/2}$	7305·0	80·9	230·2	0·084	0·149
	$^4F_{3/2}\rightarrow{}^4I_{11/2}$	9412·1	213·7	1300·4	0·473	0·844
	$^4F_{3/2}\rightarrow{}^4I_{9/2}$	11428·6	112·2	1211·4	0·440	-
				A_T=2752·3		
CFPNd	$^4F_{3/2}\rightarrow{}^4I_{15/2}$	5093·8	9·8	9·4	0·004	-
	$^4F_{3/2}\rightarrow{}^4I_{13/2}$	7318·0	73·3	209·2	0·078	0·145
	$^4F_{3/2}\rightarrow{}^4I_{11/2}$	9425·1	201·4	1228·2	0·458	0·849
	$^4F_{3/2}\rightarrow{}^4I_{9/2}$	11441·6	113·2	1235·0	0·460	-
				A_T=2681·8		
SFPNd	$^4F_{3/2}\rightarrow{}^4I_{15/2}$	5107·0	9·3	9·0	0·004	-
	$^4F_{3/2}\rightarrow{}^4I_{13/2}$	7331·2	69·7	199·2	0·084	0·150
	$^4F_{3/2}\rightarrow{}^4I_{11/2}$	9438·3	183·6	1119·9	0·474	0·843
	$^4F_{3/2}\rightarrow{}^4I_{9/2}$	11454·8	94·9	1034·8		-
				A_T=2362·9		
AFPNd	$^4F_{3/2}\rightarrow{}^4I_{15/2}$	5080·8	9·3	8·8	0·004	-
	$^4F_{3/2}\rightarrow{}^4I_{13/2}$	7305	69·4	195·8	0·086	-
	$^4F_{3/2}\rightarrow{}^4I_{11/2}$	9412·1	180	1086·4	0·480	0·841
	$^4F_{3/2}\rightarrow{}^4I_{9/2}$	11428·6	90	972·5	0·430	0·152
				A_T=2263·5		

Table 6. Radiative lifetimes (τ_R) (μs) of certain excited states of Nd^{3+} doped different fluorophosphate glasses

S. No.	Excited state	LFPNd	NFPNd	CFPNd	SFPNd	AFPNd
1	$^4G_{9/2}$	110	98	97	108	103
2	$^4G_{7/2}$	126	114	112	123	116
3	$^4G_{5/2}$	135	139	142	146	136
4	$^2H_{11/2}$	3862	3460	3398	3877	3580
5	$^4F_{9/2}$	173	186	197	219	180
6	$^4F_{5/2}$	136	151	153	173	140
7	$^4F_{3/2}$	423	363	373	423	442

is $^2H_{11/2}$>$^4F_{3/2}$>$^4F_{9/2}$>$^4F_{5/2}$> $^4G_{5/2}$>$^4G_{7/2}$>$^4G_{9/2}$ for all the glass matrices. Among various excited states, $^2H_{11/2}$ shows higher value and $^4G_{9/2}$ shows lower value showing similar trend in other glass matrices.[44]

Jacobs & Weber[45] propounded the concept of spectroscopic quality factor (χ) (Ω_4/Ω_6) to characterise the emission intensity/efficiency of $^4F_{3/2}\rightarrow{}^4I_{11/2}$ transition. Radiative properties of Nd^{3+}glasses mainly depend on the Ω_4 and Ω_6 parameters as the matrix elements $^4F_{3/2}\|U^\lambda\|^2\,{}^4I_J$ are all zeros. Figure 7 depicts the variation of χ and Ω_λ values with the variation of glass matrix. The omega values and the spectroscopic quality factors of different glasses, i.e flourophosphate,[14] fluorosilicate, fluorogermanate glasses,[46] chalcogenide glasses[47] have been compared with the present work for better understanding. The trend observed in AFPNd glass of the present work resembles the glass given in Vijayalakshmi *et al*.[13]

Smaller the spectroscopic quality factor more is the intensity. Among all the phosphate glass matrices studied, CFPNd glass matrix has shown higher χ (>1) value. For LFPNd and AFPNd glasses, χ value came out to be less than one. In the present work, the range of χ values observed in different glass matrices is 0·89–1·17. Generally χ values for Nd^{3+}glasses range from 0·22 to 1·5. It is in conformity with points discussed in Choi.[48] It is possible that the levels that have relatively large transition rates, branching ratios, and energy gaps between them will exhibit laser action.

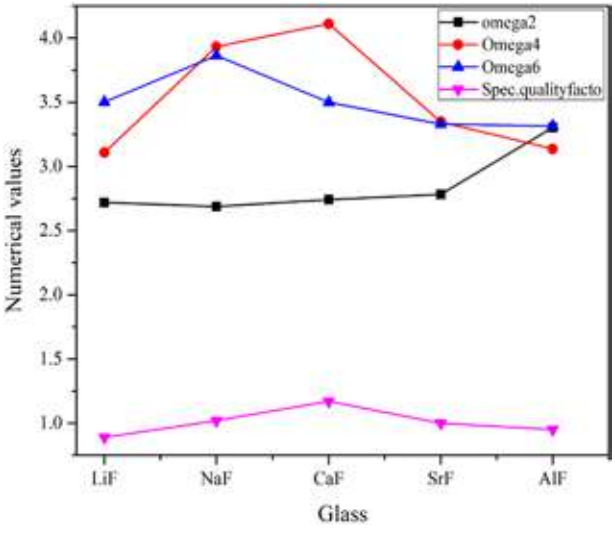

Figure 7. Variation of spectroscopic quality factor (χ) and (Ω_λ, λ=2, 4, 6) parameters with the variation of glass matrix [Colour available online]

3.8 NIR emission

The near infrared emission (NIR) spectra of various Nd^{3+} doped fluorophosphate glasses at room temperature are recorded in the range 950–1450 nm using 808 nm as an excitation wavelength. This excitation takes the Nd^{3+} ions to $^4F_{5/2}$+$^2H_{9/2}$ level. From that level, the ions reach to $^4F_{3/2}$ which is a meta stable state as described. The energy gap between $^4F_{5/2}$ and $^4F_{3/2}$ levels is very narrow; it is of the order ~1000 cm^{-1}. The lower level i.e metastable state, $^4F_{3/2}$ is populated through multi phonon relaxation. The energy gap, ΔE between the $^4F_{3/2}$ level and the levels $^4I_{11/2}$ and $^4I_{13/2}$ is big enough to have radiative emission rather than non-radiative emission. In the present work, two emission bands were observed in the emission spectra nearly at 1060 nm and 1330 nm as shown in Figure 8 for all the glass matrices. From the spectra, it is noted that the fluorescence intensity of $^4F_{3/2}\rightarrow{}^4I_{11/2}$ transition is higher than the $^4F_{3/2}\rightarrow{}^4I_{13/2}$ transition for all compositions. So, $^4F_{3/2}\rightarrow{}^4I_{11/2}$ transition at 1·06 μm is the dominant laser emission in the synthesised fluorophosphate glasses.

Experimental branching ratios (β_{exp}) are obtained by measuring the areas of observed emission peaks. It is observed that the NIR emission transition, $^4F_{3/2}\rightarrow{}^4I_{11/2}$ at 1060 nm possess higher magnitudes of β_{exp} than the $^4F_{3/2}\rightarrow{}^4I_{13/2}$ emission transition at 1330 nm for all the synthesised glass matrices. Among various phosphate glasses studied, CFPNdglass shown higher branching ratio (84·9%) and the LFPNd glass shows lower branching ratio (83·9%) as shown in Table 5. Higher values of β is a favourable factor for lower threshold and higher gain of lasers.[49] In order to evaluate the efficiency of the prepared glasses for laser applications, some important laser parameters such as stimulated emission cross sections (σ_e), effective bandwidths($\Delta\lambda_{eff}$), optical gains ($\sigma_e\times\tau_{exp}$) and gain bandwidths ($\sigma_e\times\Delta\lambda_{eff}$) have been calculated and

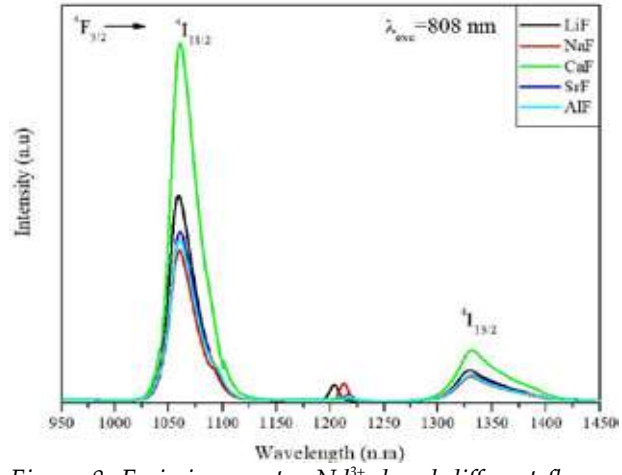

Figure 8. Emission spectra Nd^{3+} doped different fluorophosphate glasses [Colour available online]

Table 7. Certain emission properties of Nd^{3+} doped different fluorophosphate glasses for the observed transitions ((peak emission wavelengths, λ_p(nm), effective bandwidths, $\Delta\lambda_{eff}$ (nm), stimulated emission crosssections, σ_e (10^{-24} cm^2), optical gains, $\sigma_e \times \tau_{exp}$ (10^{-27} $cm^2 s$) and optical gain bandwidths, $\sigma_e \times \Delta\lambda_{eff}$ (10^{-28} cm^3))

Glass	$^4F_{3/2} \rightarrow {}^4I_{11/2}$					$^4F_{3/2} \rightarrow {}^4I_{13/2}$				
	λ_p	$\Delta\lambda_{eff}$	σ_e	$\sigma_e \times \tau_{exp}$	$\sigma_e \times \Delta\lambda_{eff}$	λ_p	$\Delta\lambda_{eff}$	σ_e	$\sigma_e \times \tau_{exp}$	$\sigma_e \times \Delta\lambda_{eff}$
LFPNd	1059	283	2·213	938	626	1329	266	0·679	287	180
NFPNd	1060	287	2·478	899	711	1330	285	0·694	251	197
CFPNd	1061	265	2·535	943	671	1331	277	0·651	242	180
SFPNd	1061	310	2·117	895	656	1331	306	0·562	237	171
AFPNd	1060	294	2·019	892	593	1330	301	0·560	247	168

are presented in the Table 7.

The stimulated emission cross section (σ_e) values for the prepared glasses are 2·213, 2·478, 2·535, 2·117 and 2·019 for LFPNd, NFPNd, CFPNd, SFPNd and AFPNd glasses, respectively. The σ_e value is found to be higher in CFPNd glass and lower in AFPNd glass. The optical gain parameter which is the product of stimulated emission cross section and radiative lifetime (τ_{exp}) values were computed to be 938·3, 899·5, 943·0, 895·4 and 892·3 for LFPNd, NFPNd, CFPNd, SFPNd and AFPNd glasses, respectively. All these values are reported in Table 7. The density and molar volume increase with an increasing cation radius. Exceptions are the Mg^{2+} and Zn^{2+} glasses, which show the same and comparably high molar volume, indicating a more constrained glass structure, as the displacement of the basic structure is limited. The variety of structural units and the rearrangement of the glass network, caused by the strong M–O interactions, create a local lanthanide environment with comparably low symmetry which results in a good emission properties. Along with optical gain band widths, emissions cross section times lifetime of the laser transition is called as optical gain of the transition. The optical gain values have been calculated and are presented in the Table 7. and they are found to be 938, 899, 943, 895 and 892 for LFPNd, NFPNd, CFPNd, SFPNd and AFPNd glasses, respectively, for $^4F_{3/2} \rightarrow {}^4I_{11/2}$ transition. The highest value of optical gain is found to be 943 in CFPNd glass. Among all the glasses studied, the CFPNd glass shows along with high σ_e, value, high optical gain and gain bandwidths in the context of modifier combination. Hence the calcium fluorophosphates glass doped with Nd^{3+} ions can be used as a lasing material.

4. Conclusions

Nd^{3+} doped different fluorophosphate glasses with systematic change in glass composition were prepared using melt quenching technique. The glass samples were analysed for structural characteristics with FTIR, FT Raman, XRD and ^{31}P NMR studies. Optical absorption and fluorescence measurements were carried out. From the optical absorption spectra and Judd–Ofelt theory, J-O intensity parameters (Ω_λ, λ=2, 4, 6) are calculated and certain radiative properties are studied. In the present work, the higher value of Ω_2 parameter in aluminium phosphate glass indicated strong covalence of metal–ligand bond. Ω_4 parameter is higher in calcium phosphate glass indicated higher rigidity of glass matrix. The spectroscopic quality factor is higher in calcium phosphate glass among all the glasses studied. Branching ratio is also higher in calcium phosphate glass for $^4F_{3/2} \rightarrow {}^4I_{13/2}$ transition. In the emission spectra, two emission lines were observed nearly at 1060 and 1330 nm under 808 nm excitation for all the prepared fluorophosphate glasses. The higher magnitudes of branching ratio, peak stimulated emission cross-section, optical gain and gain bandwidth for $^4F_{3/2} \rightarrow {}^4I_{13/2}$ transition CFPNd glass suggests that this glass composition is suitable for the efficient commercial laser emission at1060 nm.

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References

1. Hu, L. *et al.*, Research and development of neodymium phosphate laser glass for high power laser application. *Opt. Mater.*, 2016, **62**, 34–41. doi: 10.1016/j.optmat.2016.09.038
2. Balakrishnaiah, R., Babu, P., Jayasankar, C. K., Joshi, A. S., Speghini, A. & Bettinelli, M. Optical and luminescence properties of Nd^{3+} ions in K–Ba–Al-phosphate and fluorophosphate glasses. *J. Phys. Condens. Matter*, 2006, **18** (1), 165–79. doi: 10.1088/0953-8984/18/1/012
3. Ratnakaram. Y. C., Babu, S., Bharat, L. K. & Nayak, C. Fluorescence characteristics of Nd^{3+} doped multicomponent fluoro-phosphate glasses for potential solid-state laser applications. *J. Lumin.*, 2016, 175, 57–66. doi: 10.1016/j.jlumin.2016.02.009
4. Kumar, M. & Ratnakaram, Y. C. Role of TeO_2 coordination with the BaF_2 and Bi_2O_3 on structural and emission properties in Nd^{3+} doped fluoro phosphate glasses for NIR 1·058 μm laser emission. *Opt. Mater.*, 2020, **112**, 20, p. 110738, doi: 10.1016/j.optmat.2020.110738
5. SuhisaTanabe, S. Rare-earth-doped glasses for fibre amplifiers in broadband telecommunication. *Comptes Rendus Chim.*, 2002, **5** (12), 815–24. doi: 10.1016/S1631-0748(02)01449-2
6. Linganna, K. *et al.* Thermal and optical properties of Nd^{3+} ions in K–Ca–Al fluorophosphate glasses. *J. Lumin.*, 2015, 166, 328–34. doi: 10.1016/j.jlumin.2015.05.024
7. Kolobkova, E., Yasukevich, A., Kuleshow, N., Nikonorov, N. & Babkina, A. Concentration dependence of spectroscopic properties and energy transfer analysis of the fluorophosphate glasses with small phosphates content doped with Nd^{3+} ions. *J. Non-Cryst. Solids*, 2019, **526**, 119703. doi: 10.1016/j.jnoncrysol.2019.119703
8. Auzel, F. Rare earths in fluoride glasses. *Mater. Sci. Forum*, 1991, **67–68**, 489–502. doi: 10.4028/www.scientific.net/msf.67-68.489
9. Tian, Y., Xu, R., Hu, L. & Zhang, J. 2·7 μm fluorescence radiative

dynamics and energy transfer between Er^{3+} and Tm^{3+} ions in fluoride glass under 800 nm and 980 nm excitation. *J. Quant.Spectrosc. Radiat. Transfer*, 2012, **113**, (1), 87–95. doi: 10.1016/j.jqsrt.2011.09.016

10. Jayasankar, C. K., Balakrishnaiah, R., Venkatramu, V., Joshi, A. S., Speghini, A. & Bettinelli, M. Luminescence characteristics of Nd^{3+}-doped K–Ba–Al-fluorophosphate laser glasses. *J. Alloys Compounds*, 2008, **451** (1–2), 697–701. doi: 10.1016/j.jallcom.2007.04.068
11 Choi, J. H., Margaryan, A., & Shi, F. G. Optical transition properties of Yb^{3+} in new fluorophosphate glasses with high gain coefficient. *J. Alloys Compounds*, 2005, **396** (1–2), 79–85. doi: 10.1016/j.jallcom.2004.10.076
12. Kumar, G. A., De la Rosa-Cruz, E., Martinez, A., Unnikrishnan, N. V. & Ueda, K. Influence of borate content on the radiative properties of Nd^{3+} ions in fluorophosphate glasses. *J. Phys. Chem. Solids*, 2003, **64** (1), 69–76. doi: 10.1016/S0022-3697(02)00213-5
13. Vijayalakshmi, L., Naveen Kumar, K., Bhaskar Kumar, G. & Hwang, P. Structural, dielectric and photoluminescence properties of Nd^{3+} doped Li_2O–LiF–B_2O_3–ZnO multifunctional optical glasses for solid state laser applications. *J. Non-Cryst. Solids*, 2017, **475**, 28–37. doi: 10.1016/j.jnoncrysol.2017.08.024
14. Tian, Y., Zhang, J., Jing, X. & Xu, S. Optical absorption and near infrared emissions of Nd^{3+} doped fluorophosphate glass. *Spectrochim. Acta A*, 2012, **98**, 355–8. doi: 10.1016/j.saa.2012.08.047
15. Kirkpatrick, R. J. & Brow, R. K. Nuclear magnetic resonance investigation of the structures of phosphate and phosphate-containing glasses : a review. *Solid State Nucl. Magn. Reson*., 1995, **5** (1), 9–21.
16. Hussin, R., Holland, D. & Dupree, R. A MAS NMR structural study of cadmium phosphate glasses. *J. Non-Cryst. Solids*, 2002, **298**, 32–42.
17. Wan, J. *et al.* Composition-dependent spectroscopic properties of Nd^{3+}-doped tellurite-germanate glasses. *Phys. B: Condens. Matter*, 2010, **405** (8), 1958–63. doi: 10.1016/j.physb.2010.01.051
18. Suratwala, T. I., Steele, R. A., Wilke, G. D., Campbell, J. H. & Takeuchi, K. Effects of OH content, water vapor pressure, and temperature on sub-critical crack growth in phosphate glass. *J. Non-Cryst. Solids*, 2000, **263**, 213–27. doi: 10.1016/S0022-3093(99)00680-8
19. Bai, G., Ding, J., Tao, L., Li, K., Hu, L. & Tsang, Y. H. Efficient 2·7 micron emission from Er^{3+}/Pr^{3+} codoped oxyfluorotellurite glass. *J. Non-Cryst. Solids*, 2012, **358** (23), pp. 3403–6. doi: 10.1016/j.jnoncrysol.2012.08.016
20. Liao, M., Sun, H., Wen, L., Fang, Y. & Hu, L. Effect of alkali and alkaline earth fluoride introduction on thermal stability and structure of fluorophosphate glasses. *Mater. Chem. Phys*., 2006, **98** (1), 154–8. doi: 10.1016/j.matchemphys.2005.09.006
21. Ghosh, S. & Ghosh, A. Relaxation in mixed alkali fluoride glasses. *J. Non-Cryst. Solids*, 2007, **353**, 13–15. doi: 10.1016/j.jnoncrysol.2006.09.047.
22. Zhao, X. & Sakka, S. Properties of mixed alkali fluoride glasses in the ZrF_4–PbF_2–AlF_3–RF (R=Li, Na, K) system. *J. Non-Cryst. Solids,* 1988, **103** (1), 93–100.
23. Damodaraiah, S., Prasad, V. R. & Ratnakaram, Y. C. Investigations on spectroscopic properties of Nd^{3+} doped alkali bismuth phosphate glasses for 1·053 μm laser applications. *Opt. Laser Technol*., 2019, **113**, 322–9. doi: 10.1016/j.optlastec.2019.01.010.
24. Flórez, A., Ulloa, E. M. & Cabanzo, R. Optical properties of Nd^{3+} and Er^{3+} ions in fluoro-phosphate glasses: effects of P_2O_5 concentration and laser applications. *J. Alloys Compounds*, 2009, **488** (2), 606–611. doi: 10.1016/j.jallcom.2009.09.046
25. Rajagukguk, J., Situmorang, R., Djamal, M. & Rajaramakrishna, R. Structural, spectroscopic and optical gain of Nd^{3+} doped fl uorophosphate glasses for solid state laser application. *J. Lumin*., 2019, **216**. doi: 10.1016/j.jlumin.2019.116738
26. Babu, S., Seshadri, M. Balakrishna, A., Reddy Prasad, V. & Ratnakaram, Y. C. Study of multicomponent fluoro-phosphate based glasses: Ho^{3+} as a luminescence center. *Phys. B: Condens. Matter*, 2015, **479**, 26–34. doi: 10.1016/j.physb.2015.09.023
27. Yunming Li, Xiaofeng Liang, Guangfu Yin, Shiyuan Yang, Junxia Wang, & Haixiang Zhu Infrared spectra of iron phosphate glasses with gadolinium oxide. *J. Mol. Struct.*, 2011, **1004** (1–3), 188–92. doi: 10.1016/j.molstruc.2011.08.003
28. Morsi, R. M. M. & Ibrahiem, S. Effect of Li_2O on the structure, electrical and dielectric properties of xLi_2O·(20–x)CaO·30P_2O_5.30V_2O_5.20Fe_2O_3 glasses. *Phys. B: Condens. Matter*, 2011, **406** (15–16), 2982–9. doi: 10.1016/j.physb.2011.04.043
29. Tiwari, B., Pandey, M., Sudarsan, V., Deb, S. K. & Kothiyal, G. P. Study of structural modification of sodium aluminophosphate glasses with TiO_2 addition through Raman and NMR spectroscopy. *Phys. B: Condens. Matter*, 2009, **404** (1), 47–51. doi: 10.1016/j.physb.2008.10.016
30. Djouama, T., Poulain, M., Bureau, B. & Lebullenger, R. Structural investigation of fluorophosphate glasses by ^{19}F , ^{31}P MAS-NMR and IR spectroscopy. *J. Non-Cryst. Solids*, 2015, **414**, 16–20. doi: 10.1016/j.jnoncrysol.2015.01.017
31. Karabulut, M., Metwalli, E. & Brow, R. K. Structure and properties of lanthanum ± aluminum ± phosphate glasses. *J. Non-Cryst. Solids*, 2001, **283** (1–3), 211–19.
32. Mott, N. F. & Davis, E. A. Conduction in non-crystalline systems V. Conductivity, optical absorption and photoconductivity in amorphous semiconductors. *Philos. Mag*., 1970, **22** (179), 903–22. [Online]. Available: https://doi.org/10.1080/14786437008221061
33. Abdelghany, A. M., Elbatal, H. A. & Marei, L. K. Optical and shielding behavior studies of vanadium-doped lead borate glasses. *Radiat. Effects Defects Solids*, 2012, **167** (1), 49–58. doi: 10.1080/10420150.2011.629418
34. Ratnakaram, Y. C., Vijaya Kumar, A., Tirupathi Naidu, D. & Chakradhar, R. P. S. Absorption and emission properties of Nd^{3+} in lithium cesium mixed alkali borate glasses. *Solid State Commun*., 2005, **136** (1), 45–50. doi: 10.1016/j.ssc.2005.06.016
35. Carnall, W. T., Fields, P. R. & Rajnak, K. Electronic energy levels of the trivalent lanthanide aquo ions. IV. Eu 8+. *J. Chem. Phys*., 1968, **49** (10), 4424–42. doi: 10.1063/1.1669893
36. Hemantha Kumar, G. N., Rao, J. L., Ravindra Prasad, K. & Ratnakaram, Y. C. Fluorescence and Judd-Ofelt analysis of Nd^{3+} doped P_2O_5–Na_2O–K_2O glass. *J. Alloys.Compounds*, 2009, **480** (2), 208–215. doi: 10.1016/j.jallcom.2009.02.033
37. Eyring, L. & Gschneidner, K. A. *Handbook on the Physics and Chemistry for Rare Earths.* Elsevier, 1999, **Vol. 26**.
38. Babu, S., Balakrishna, A., Rajesh, D. & Ratnakaram, Y. C. Investigations on luminescence performance of Sm^{3+} ions activated in multicomponent fluoro-phosphate glasses. *Spectrochimica Acta A*, 2014, **122**, 639–48. doi: 10.1016/j.saa.2013.11.102
39. Reisfeld, R. & Jørgensen, C. K. Chemical Bonding and Lanthanide Spectra. In *Lasers and Excited States of Rare Earths*. Springer, Berlin, 1977, **Vol. 1**, 123–56. doi: 10.1007/978-3-642-66696-4_3
40. Ratnakaram, Y. C., Srihari, N. V., Kumar, A. V., Naidu, D. T. & Chakradhar, R. P. S. Optical absorption and photoluminescence properties of Nd^{3+} doped mixed alkali phosphate glasses-spectroscopic investigations. *Spectrochim. Acta A*, 2009, **72** (1), 171–7. doi: 10.1016/j.saa.2008.09.008
41. Judd, B. R. Optical absorption intensities of rare-earth ions. *Phys. Rev*., 1962, **197** (3), 750.
42. You, A., Be, M. A. Y. & In, I. Intensities of crystal spectra of rare-earth ions. *J. Chem. Phys*., 1962, **511**. doi: 10.1063/1.1701366
43. Rao, K. V., Babu, S., Venkataiah, G. & Ratnakaram, Y. C. Optical spectroscopy of Dy^{3+} doped borate glasses for luminescence applications, *J. Mol. Struct*., 2015, **1094**, 274–80. doi: 10.1016/j.molstruc.2015.04.015
44. Balakrishna, A., Rajesh, A., Rajesh, D. & Ratnakaram, Y. C. Structural and optical properties of Nd^{3+} in lithium fluoro-borate glass with relevant modifier oxides. *Opt. Mater*., 2013, **35** (12), 2670–6. doi: 10.1016/j.optmat.2013.08.004
45. Jacobs, R. R. & Weber, M. J. Dependence of the $^4F_{3/2}$→$^4I_{11/2}$ induced-emission cross section for Nd^{3+} on glass composition. *IEEE J. Quant. Electron*., 1976, **12** (2), 102–11. doi: 10.1109/JQE.1976.1069101
46. Ryba-Romanowski, W., Dominiak-Dzik, G., Solarz, P. & Lisiecki, R. Transition intensities and excited state relaxation dynamics of Dy^{3+} in crystals and glasses: A comparative study. *Opt. Mater*., 2009, **31** (11), 1547–54. doi: 10.1016/j.optmat.2009.04.013
47. Tang, G., Yang, Z, Luo, L. & Chen, W. Optical properties and local structure of Dy^{3+}-doped chalcogenide and chalcohalide glasses. *J. Rare Earths*, 2008, **26** (6), 889–94. doi: 10.1016/S1002-0721(09)60027-2
48. Choi, J. H., Margaryan, A., Margaryan, A., Shi, F. G. & Van Der Veer, W. Fluorescence and nonradiative properties of Nd^{3+} in novel heavy metal contained fluorophosphate glass. *Adv. OptoElectron*., 2001, **39892.** doi: 10.1155/2007/39892
49. Mahraz, Z. A. S. *et al.* Spectroscopic investigations of near-infrared emission from Nd^{3+}-doped zinc-phosphate glasses: Judd-Ofelt evaluation. *J. Non-Cryst. Solids*, 2019, **509**, 106–14. doi: 10.1016/j.jnoncrysol.2018.05.013

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STUDY ON GENDER DIFFERENCE IN SUICIDAL IDEATION AMONG ADOLESCENTS

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ABSTRACT

The teenage years are challenging for teens and their parents. Adolescents face many new pressures and may not always react in the healthiest ways to the problems they encounter. Social difficulties, stress, financial crisis, academic pressures, and other concerns facing teens may contribute to suicidal ideation. The World health organization has acknowledged that suicidal behavior is a major public health problem in every country. Suicide rates gradually increasing in India. So, this study aims to find out gender difference between suicidal ideation among adolescents. Total 50 sample were selected for this study and suicidal ideation scale was used for this study. The study results revealed that there were significant differences between boys and girls with respect to suicidal ideation. Girls scored high mean score when compare to boys. It can be conclude that external and internal factors make them to more vulnerable to have suicidal thoughts in adolescents.

Keywords: Gender Difference, Suicidal, Adolescents, World health organization

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INTRODUCTION

Adolescence is the phase of life between childhood and adulthood, from ages 10 to 19. It is a unique stage of human development and an important time for laying the foundations of good health. Adolescents experience rapid physical, cognitive and psychosocial growth. This affects how they feel, think, make decisions, and interact with the world around them.

Suicidal ideation, sometimes referred to as suicidal thoughts, describes thoughts, fantasies, ideas or images related to committing suicide. Contrary to common belief, depression and suicidal thoughts are not limited to adults, but symptoms and warning signs are often different in teens.

Suicidal ideation in teens is often caused by untreated depression or drug misuse and always needs to be taken seriously. Suicidal thoughts and depression often have many causes. Social difficulties, stress, academic pressures, and other concerns facing teens may contribute to suicidal ideation.

The role that gender plays as a risk factor for suicide has been studied extensively. While females show higher rates of non-fatal suicidal behavior and suicide ideation (thoughts),and reportedly attempt suicide more frequently than males do, males have a much higher rate of suicide. As of recent World Health Organization (WHO) releases, challenges represented by social stigma, the taboo to openly discuss suicide, and low availability of data are still, to date, obstacles leading to poor data quality for both suicide and suicide attempts: "given the sensitivity of suicide – and the illegality of suicidal behaviour in some countries – it is likely that under-reporting and misclassification are greater problems for suicide than for most other causes of death."

Many researchers have attempted to find explanations for why gender is such a significant indicator for suicide. A common explanation relies on the social constructions of hegemonic masculinity and femininity. According to literature on gender and suicide, male suicide rates are explained in terms of traditional gender roles. Male gender roles tend to emphasize greater levels of strength, independence, risk-taking behavior, economic status, and individualism. Reinforcement of this gender role often prevents males from seeking help for suicidal feelings and depression.

REVIEW OF LITERATURE

Afroza. B (2021) Studied Social Determinants of Suicidal Ideation among Adolescents in Rural Bangladesh. This Study showed that lifetime prevalence of suicidal ideation was 5% among adolescents. The majority of adolescents with suicidal ideation were female (67, 5.3%), unmarried (106, 5.5%) and students (86, 6.2%). Suicidal ideation was significantly associated with age, education, occupation and living with parents or others. Suicidal ideation was more common among adolescents with parents from the low-income group (5.5%).

Cormac O.B et.,al (2020) Studied Adolescent Suicide Ideation, Depression and Self-Esteem: Relationships to a New Measure of Gender Role Conflict. The that regression analyses and tests of mediation revealed that depression significantly mediated the relationship between GRC and negative suicide ideation, whilst self-esteem and depression significantly mediated the relationship between GRC and positive suicide ideation.

Yi-Yang Zhang.Y.Y et.,al (2019) had done a study on Gender differences in suicidal ideation and health-risk behaviors among high school students in Beijing, China. The prevalence of suicidal ideation was significantly higher for girls (13.3%) than boys (10.7%). The multivariate regression analyses indicated that high academic pressure, running away from home, feeling lonely or sad/hopeless, being bullied, fighting, and binge drinking were significantly associated with suicidal ideation in boys and girls. Factors more strongly associated with suicidal ideation in girls than boys were being in junior vs senior high school (girl vs boys: 1.24 vs NA), high academic pressure (2.42 vs 1.55), ever smoking (1.52 vs NA), binge drinking (1.30 vs 1.17), fighting once (1.63 vs 1.06) and being sad/hopeless (2.39 vs 2.04) and their interaction with gender were all statistically significant ($P < 0.05$). A lower likelihood of suicidal ideation was found among boys, but not girls, who had PE class two or more days per week.

Andrea.M.M (2019) studied Gender differences in suicidal behavior in adolescents and young adults: systematic review and meta-analysis of longitudinal studies. The study revealed that. Females presented higher risk of suicide attempt and males for suicide death. Common risk factors of suicidal behaviors for both genders are previous mental or substance abuse disorder and exposure to interpersonal violence. Female-specific risk factors for suicide attempts are eating disorder, posttraumatic stress disorder, bipolar disorder, being victim of dating violence, depressive symptoms, interpersonal problems and previous abortion. Male-specific risk factors for suicide attempt are disruptive behavior/conduct problems, hopelessness, parental separation/divorce, friend's suicidal behavior, and access to means. Male-specific risk factors for suicide death are drug abuse, externalizing disorders, and access to means.

Riaz.U et.,al (2019) studied Suicidal ideation, suicide planning, and suicide attempts among adolescents in 59 low-income and middle-income countries: a population-based study. The study results revealed that girls had higher prevalence than boys for suicidal ideation (18·5%, 16·4–20·6 vs 15·1%, 13·4–16·7), suicide planning (18·2%, 15·8–20·6 vs 15·6%, 13·7–17·6), and suicide attempts (17·4%, 15·0–19·8 vs 16·3%, 14·0–18·6). Adolescents aged 15–17 years had higher prevalence than those aged 13–14 years of suicidal ideation (17·8%, 15·8–19·8 vs 15·9%, 14·1–17·6), suicide planning (17·8%, 15·7–20·0 vs 16·3%, 14·7–17·9), and suicide attempts (17·6%, 15·2–20·0 vs 16·2%, 13·8–18·5).

Achyut R.P (2019) Studied factors associated with suicidal ideation and suicidal attempts among adolescent students in Nepal: Findings from Global School-based Students Health Survey. The study found that nearly 13.59% of the participants had considered suicide while 10.33% had attempted it. Food insecurity (OR = 2.32, CI = 1.62–3.32), anxiety (OR = 2.54, CI = 1.49–4.30), loneliness (OR = 2.51, CI = 1.44–4.36) and gender (OR = 1.39, CI = 1.03–1.89) were identified as risk factors of suicidal ideation. Anxiety (OR = 3.02, CI = 1.18–7.74), loneliness (OR = 2.19, CI = 1.28–3.73) truancy (OR = 1.99, CI = 1.40–2.82), cigarette use (OR = 3.13, CI = 1.36–7.23) and gender (OR = 1.60, CI = 1.07–2.39) were identified as risk factors of suicidal attempt. Having 3 or more close friends was found to have protective effect (OR = 0.35, CI = 0.16–0.75) against suicidal attempt.

Reza. Z et.,al (2017) had done a study on suicidal ideation and its correlates among high school students in Iran: a cross-sectional study. The results revealed that Overall, 62 (4.1%, 95% CI= 3.1, 5.2) of 1,517 students had thoughts of suicide. Three hundred and thirteen (20.6%, 95% CI= 18.6, 22.7) students reported being bullied in the previous 30 days. Being worried that they could not eat or did not feel hungry (Adjusted Odds Ratio (AOR) = 4.15; 95% Cl [1.71, 10.07] were all factors positively associated with suicidal ideation.

Each suicide is a personal tragedy that prematurely takes the life of an individual and has a continuing ripple effect, dramatically affecting the lives of families, friends and communities. According to the National Crime Records Bureau (NCRB) ,a total of 139,123 people died by suicide in India 2019 showing an increase of 3.4% in comparison to 2018 and the rate of suicides has increased by 0.2% during 2019 over 2018(NCRB).This suicide rate was 10.4 deaths per 100,000 population. There are various causes of suicides like professional/career problems, sense of isolation, abuse, violence, family problems, mental disorders, addiction to alcohol, financial loss, chronic pain etc.

All these information gives support to the present study which hypothesizes that there are increasing number of suicide ideation among adolescents. Hence this study tries to find out the factors that make them vulnerable to commit suicide.

METHODOLOGY

A total sample of 100 (50 boys and 50 girls) were selected for this study from Intermediate colleges in Kakinada. Suicidal ideation scale by Sisodia and Bhatnaga r (2005) was used for this study and random sampling method was chosen and collected data was analyzed by using t sample test.

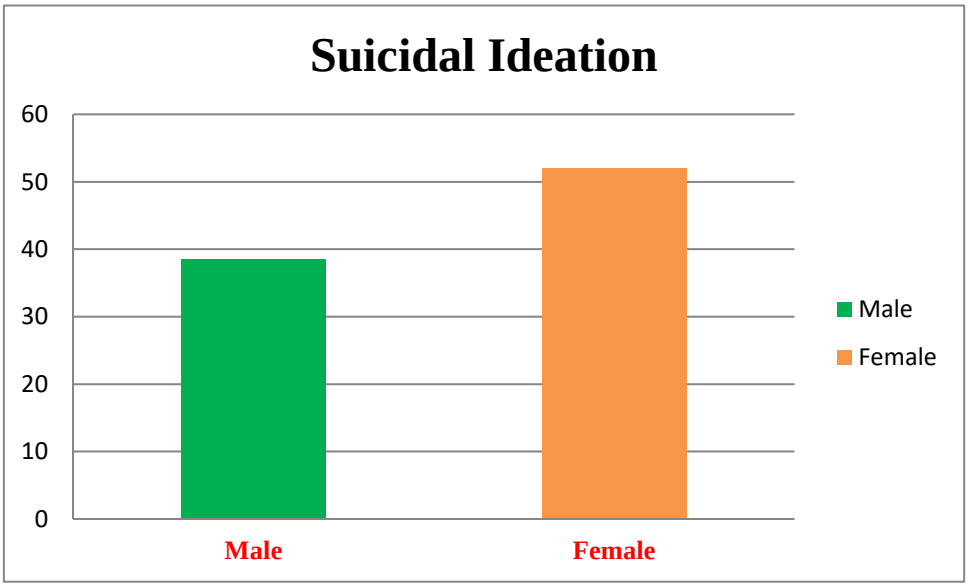
RESULTS AND DISCUSSION

Table: 1 Mean difference of suicidal ideation among adolescent boys and girls

Suicidal Ideation	Boys		Girls		t-value	P
	Mean	S.D	Mean	S.D		
	38.48	29.18	52.04	14.88	-2.069	0.04*

Note: *Significance at (P<0.05), **Significance at (P<0.01), NS- Not Significant

This table 1 represents the gender differences in suicidal ideation. The results of this study clearly shows that there were significant differences between boys and girls with respect to suicidal ideation. Girls scored high mean score when compared to boys. This means that adolescent's girls might have faced interpersonal conflicts, attitude of inequality of family members, academic stress, loss of loved ones, sleep disturbances and financial crisis which make them to have suicidal thoughts. The results are in congruence with study conducted by Andrea. M.M (2019) who revealed that female suicidal ideation risk factors for suicide attempts are posttraumatic stress disorder, depressive symptoms, and interpersonal problems. And also U Wunderlich (2001) who concluded The female suicide attempters showed suicidal thoughts and suicide attempts significantly more when compare to male.



CONCLUSION

The findings of this study revealed that girls scored high mean score on suicidal ideation. The study results clearly depicted that there were significant mean differences existed between both the genders on suicidal ideation. It evident that girls scored high mean score compared to boys. Factors like financial, academic, family and interpersonal factors which makes them to more vulnerable for committing suicides. This study results should be taken into consideration while planning suicidal prevention programme for adolescents.

REFERENCES

[1] Afroza B, (2021) Social Determinants of Suicidal Ideation among Adolescents in Rural Bangladesh, Licentiate thesis, Comprehensive summary

[2] Andrea.M.M (2019) Gender differences in suicidal behavior in adolescents and young adults: systematic review and meta-analysis of longitudinal studies. International Journal Public Health. 64(2):265-283. doi: 10.1007/s00038-018-1196-1. Epub

[3] Cormac O.B, Jessica McCutcheon 3, Paul F. Conway1,2, Joan Hanafin2,4 and Todd G. Morrison (2020) Adolescent Suicide Ideation, Depression and Self-Esteem: Relationships to a New Measure of Gender Role Conflict.

[4] National Crime Records Bureau (2020).Accidental Deaths and suicides in India 2019http://ncrb.gov.in/StatPublications/ADSI/ADSI2019/ADSI-2019-Full-Report.pdf

[5] Pandey AR, Bista B, Dhungana RR, Aryal KK, Chalise B, Dhimal M (2019) Factors associated with suicidal ideation and suicidal attempts among adolescent students in Nepal: Findings from Global School-based Students Health Survey. PLoS ONE 14(4): e0210383. https://doi.org/10.1371/journal.pone.0210383

[6] Riaz.U, Nicola W.B, Myfanwy. M, Shanchita.R.K and Asaduzzaman.K (2019) Suicidal ideation, suicide planning, and suicide attempts among adolescents in 59 low-income and middle-income countries: a population-based study. Volume 3, Issue 4, P223-233. DOI:https://doi.org/10.1016/S2352-4642 (18)30403-6.

[7] Sisodia D.S, BhatnagarV (2005)Suicidal Ideation Scale, National Psychologiacal Corporation, Bhargava Bhavan,4/230,Kacheri Ghat, Agra -282004

[8] Yi-Yang Zhang et.,al (2019) Gender differences in suicidal ideation and health-risk behaviors among high school students in Beijing, China. Journal of Global Health. ; 9(1): 010604. doi: 10.7189/jogh.09.010604

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Research Article

DELVING INTO THE SPECTROSCOPIC PROPERTIES OF DY3+IN DIFFERENT FLUOROPHOSPHATE GLASSES FOR MULTITUDE OF APPLICATIONS

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A B S T R A C T

Dy3+ ion doped different fluorophosphate glasses were prepared by melt-quenching process. Structural study was conducted by XRD, FTIR, FT-Raman and 31P MAS NMR spectroscopy. The optical properties were examined using absorption and photoluminescence spectroscopy. Various structural groups that made up the glass were identified using FTIR and FT-Raman spectra. Breaking up of metaphosphate chains were detected by the decrease of Q2 tetrahedral sites paving the formation of pyrophosphate groups (Q1) as revealed by 31P MAS NMR spectroscopic study. Judd-Ofelt intensity parameters Ω2, Ω4, and Ω6, were calculated from absorption spectra. Radiative lifetimes (τR), branching ratios (βR) integrated absorption cross-sections(Σ)and were calculated subsequently using the above said technique. Experimental branching ratios (βexp) and stimulated emission cross-sections (σP) were calculated for all the observed emission transitions of Dy3+doped prepared fluorophosphate glasses. The CIE chromaticity co-ordinates, correlated colour temperature (CCT) and yellow to blue (Y/B) intensity ratios were calculated to ascertain these glasses usefulness for photonic applications in lasers and white LEDs..

INTRODUCTION

According to United Nations environmental programme (UNEP) 20% of the world's electricity production is used for lighting purposes and is responsible for 6% of CO2 emission. It is going to increase at enormous rate of 60% by 2030. This will have far reaching consequences on the climate change. The problems associated with the conventional white light emitting diodes (WLEDs) which make use of crystalline phosphors, ultraviolet LED chip and epoxy resin are that, deterioration of the resin that encapsulates the conventional LEDs, large refractive index difference between the resin and phosphor which increases the amount of scattering of light, decrease of overall lifetime of the device to name a few. So, there is a dire need to develop energy efficient lighting systems.

Spectroscopic examination unravelled the fact that the intra 4f electronic transitions of rare earth ions play a vital role and made glasses doped with rare-earth ion as technologically suitable and superior materials for solid-state lasers, planar waveguides, microchip lasers to name a few. Low melting temperatures, ultraviolet (UV) transmission and good optical characteristics are some of the outstanding features of fluorophosphate glasses that made these glasses suitable for various applications. A range of materials can be created using these glasses including fast ion conducting materials, energy efficient solid-state lighting devices, laser hosts, and biocompatible ones. and production of these glasses have good chemical durability which made them carve a niche among photonic glasses [1-4].

Among Ln3+ ions, trivalent dysprosium (Dy3+) doped glasses are widely studied for their applications in telecommunication and solid-state lighting devices, in the fabrication and functioning of optical amplifier systems. The study of luminescence from the 4F9/2 level of Dy3+ ions is highly significant towards this end, as its range covers the visible and NIR regions. Dy 3+is an excellent luminescent ion whose visible spectrum has three bands, blue (460–485 nm; 4F9/2 to 6H15/2), yellow (570–590 nm; 4F9/2 to 6H13/2) and red (635–655 nm; 4F9/2 to 6H11/2). Of these 4F9/2→6H13/2transition is an electric dipole (E.D) and 4F9/2→6H15/2 transition which is a magnetic dipole (M.D) transition. These two transitions correspond to yellow and blue regions respectively. The E.D transition is hypersensitive and hence that transition's intensity is highly influenced by the nature of the host. The intensity of 4F9/2→6H15/2 transition is less sensitive to the host [5-8]. Hence, at a suitable yellow-to-blue (Y/B) intensity ratio, Dy3+ can emit white light. Thus, luminescent materials doped with Dy3+ ion are usually employed in the production of white light both in glasses and in phosphors.

In the present work, a systematic probe was carried out to arrive at some conclusions about the effect of alkali, alkaline

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and post transition metal fluorides, keeping dysprosium ion concentration as same i.e 0.5 mol%. The addition of zinc oxide makes the fluorophosphate glass moisture resistant and strengthens the glass network. Addition of alkali fluorides form new substructures which will alternate the phosphate network. These substructures behave as defects in the host glass network. The extent of depolymerization of the glass network heavily depends on the ionic radius of the modifier ion and its suitability with the ligand network. Spectroscopic properties such as intensity parameters, spectral intensities, and radiative properties namely transition probabilities (AR), radiative lifetimes (τR) and integrated absorption cross-sections (Σ), Emission properties such as emission intensities, branching ratios (βexp) and peak stimulated emission cross-sections (σP) were studied. In connection with optical properties, structural properties such as X-ray diffraction (XRD), Fourier transform infrared (FTIR) spectroscopy, FT-Raman spectroscopy and 31P magic angle spin nuclear magnetic resonance (MAS NMR) spectroscopy were also investigated.

Experimental

Glass preparation

A series of five (59.5NH4H2PO4+15ZnO+15BaF2+10X+0.5Dy2O3) different fluorophosphate (X=LiF, NaF, CaF2, SrF2, AlF3) glass systems were prepared by melt quenching route. Analar grade chemicals NH4H2PO4, ZnO, BaF2, LiF, NaF, CaF2, SrF2, AlF3 and DyF3 of highly purified (99.9%) were used in the glass preparation. The above glass composition each of 15g pre-weighed amounts of chemicals were rigorously pulverized in an agate mortar to mix its constituents. After this process, the fine powder is taken in a porcelain crucible which can with stand high temperatures and melted in an electric furnace at a temperature range of 1120-1140oC for an hour. The melted mixture was stirred and allowed to equilibrate by the release of gas bubbles. After homogenization, the molten chemical was quickly transferred into hot square brass plates to ensure glass formation. After casting, the samples were annealed at 300oC for about 120 minutes to remove any thermal stress that might exist in the samples. Then the samples were taken to room temperature slowly. The glasses were polished properly for characterization of their physical and optical measurements. Basing on cation change, the prepared glasses are named as follows:

59.5NH4H2PO4+15ZnO+15BaF2+10LiF+0.5Dy2O3 --- LFPD
59.5NH4H2PO4+15ZnO+15BaF2+10NaF+0.5Dy2O3 --- NFPD
59.5NH4H2PO4+15ZnO+15BaF2+10CaF2+0.5Dy2O3 --- CFPD
59.5NH4H2PO4+15ZnO+15BaF2+10SrF2+0.5Dy2O3 --- SFPD
59.5NH4H2PO4+15ZnO+15BaF2+10AlF3+0.5Dy2O3 ---AFPD

Measurements

The densities of the manufactured glasses were measured using Archimedes' principle with water as fluid that gives buoyancy. Refractive indices of the glasses were measured with ATAGO model 1211 of Abbe refractometer. The physical properties of the above Dy 3+ are calculated and are shown in Table.1

XRD profiles of these glasses were recorded in the range 10-800 with RIGAKU X-ray diffractometer. The Fourier transform infrared spectra were recorded at room temperature with 4 cm-1 spectral resolution between 400 and 4000 cm-1 by a BRUKER FTIR spectrometer. FT-RAMAN spectra were analysed between 50 and 1500 cm-1 by a BRUKER: RFS 27 spectrometer. Solid state 31P MAS NMR spectra were obtained at 400 MHz using a JOEL ECX400 DELTA2 NMR spectrometer with a 4 mm probe. The acquisition time was 18 ms and pulse width was 2.9μs. The 31P spectra were collected in 128 scans, 5s relaxation delay. The optical absorption spectra were recorded using JASCO V-570 spectrophotometer. The fluorescence spectra were recorded with FL920 in the range of 450-700 nm, which functions with xenon lamp as excitation source.

Table 1 Physical Properties of Dy3+ doped different fluorophosphate glasses

S. No	property	Glass				
		LFPD	NFPD	CFPD	SFPD	AFPD
1	Density, ρ (g/cm3)	3.036	3.067	3.136	3.187	3.012
2	Refractive index, n	1.634	1.641	1.643	1.612	1.632
3	Molar volume, V_m (cm3/mol)	35.83	35.98	36.37	37.60	39.63
4	Ion concentration, N_i (1022 ions/cm3)	0.141	0.139	0.137	0.133	0.126
5	Inter ionic distance, r_i (nm)	1.920	1.929	1.938	1.957	1.993
6	Polaron radius, r_p (A0)	0.773	0.778	0.781	0.788	0.799
7	Thickness,(cm)	0.335	0.346	0.350	0.345	0.336

RESULTS AND DISCUSSION

X-ray diffraction (XRD)

X-ray diffraction (XRD) delineation of the prepared 0.5mol% Dy3+ doped different five glass samples were recorded between $100 \leq 2\theta \leq 800$ and were juxtaposed and shown in Fig.1. The manufactured glasses had shown broad diffused scattering at low angles and did not show any sharp Bragg's peaks. The amorphous nature of glass samples was confirmed by the X-ray diffraction pattern.

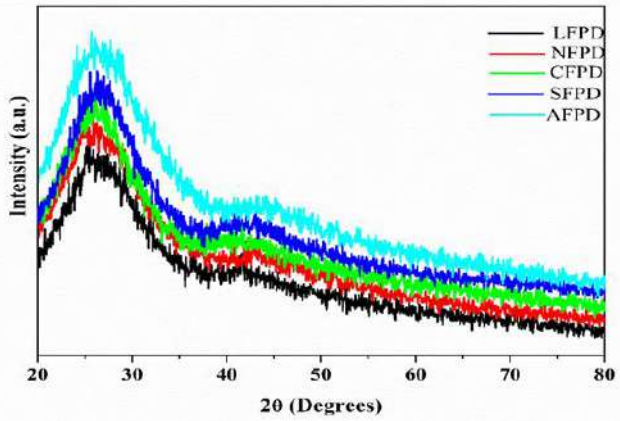

Fig 1 XRD patterns of Dy^{3+} doped different fluorophosphate glasses

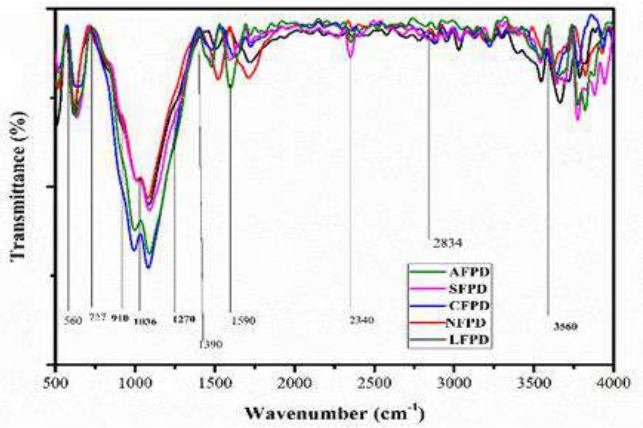

Fig 2 FTIR spectra of Dy^{3+} doped different fluorophosphate glasses

Fourier Transform infrared (FTIR) spectra

FTIR is the result of absorption of light by the vibrating molecules, it elucidates presence of various chemical units and functional groups in the prepared glass samples. FTIR spectra were recorded for the glasses and were shown in Fig. 2. The studied spectra of these glass matrices were in the wavenumber range of 500-4000 cm-1. Many absorption bands around 560, 727, 910, 1036, 1270, 1390, 1590, 2340, 2834, and 3560 cm-1 were noticed. The ascription of the absorption bands were done by the comparison of our results with data given in the literature and the following conclusions were made. The band at 560 cm-1 was assigned to deformation mode in Q2 tetrahedra. The band at 727cm-1 was assigned to symmetric stretching mode connections P-O bridging groups intermediate PO2- tetrahedra Q2. The band at 910-1036 cm-1 was related to elongation of asymmetric links (P-O-P) between Q2 tetrahedra and elongation symmetric connections P-O terminal (Q2). The band at 1390 cm-1 was due to P-OH deformation. The bands in the range 2340 cm-1 were due to the existence of antisymmetric stretching of water molecules. The band at 2834 cm-1 was due to the hydrogen bonding. The bands at 3560 cm-1 were due to symmetric stretching vibration of hydroxyl groups (O-H) [9-13].

FT-RAMAN spectra analysis

FT Raman spectrum is due to the scattering of light by the molecules of the substance. It gives a wealth of information about the structural parameters of host glass matrix and it is shown in Fig 3 for the glasses studied.

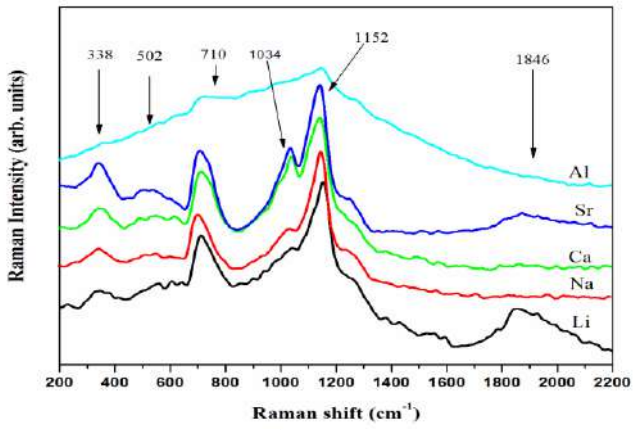

Fig 3 FT -Raman spectra of Dy $^{3+}$doped different fluorophosphate glasses

The scattering spectra were captured in the range of 200 cm-1 to 2200 cm-1. In the present work six distinctive bands were noticed except for AFPD glass (very low intensities) at ~338 cm-1, ~502 cm-1, ~710 cm-1, ~1034 cm-1, ~1152 cm-1, and ~1846 cm-1 for all the glasses. The band at 338 cm-1 was due to F-PO3 scissoring mode. The band at 502 cm-1 was due to distortion mode of P-O and P-F vibrations. The band at 710 cm-1 was due to (p-o-p)sys stretching. The bands around 1030 cm-1 and,1152 cm-1 were due to symmetric stretching of nonbridging oxygen on a Q2 tetrahedron and are also due to (p-o-p)asym typical vibrational motion of PO4 tetrahedra and the motion of cationic polyhedral. Existence of this band shows that various metal cations function as network modifiers in the fluorophosphate glass structure [14-17]. The band at 1152 cm-1 was the most intense one for all the glass compositions. Hence it can be inferred that addition of alkali and alkaline earth fluorides increases the (p-o-p)asym in the glass matrix.

Magic angle spin nuclear magnetic resonance (MAS NMR) analysis

31P MAS NMR is an invaluable tool to fathom the structures of phosphate-model glasses due to observed chemical shifts that are sensitive to the phosphorus environment. It gives information about the degree of polymerization of glass structure. The local symmetry of the atoms in the prepared/examined samples can be quantitatively studied by solid-state NMR due to its element selectivity property. The phosphate bonding is best described through Qn species, here the superscript *n* refers to the number of bridging oxygens per tetrahedron. This categorization can be met by means of the three parameters of the chemical shift tensor. It has typical ranges of values for different Qn groups [18-22].

Based on the bridging oxygens number with the surrounding tetrahedra, three types of tetrahedral classification can be done. They are Q1 – phosphate tetrahedra with one bridging oxygen; Q2 – with two bridging oxygens; and Q3 – with three bridging oxygens. The bedrock for the phosphate glass structure is cross-linked Q3 tetrahedron. But with the change of network modifier cations the degree of the presence of Q3 changes leading to the formation of Q2 and Q1 [23-26]. This is structural changes can be studied with 31 P NMR Spectra.

Fig. 4 shows the results of 31P NMR spectra of the prepared glasses. The major peaks observed are at -8.74, -22.83, -8.65, -8.65, and -22.83 for LFPD, NFPD, CFPD, SFPD and AFPD glasses respectively. In the case of LFPD glass matrix, a pronounced signal at -8.74 ppm can be assigned with Q1 structural units. It confirms that the fluorine takes place into PO3F tetrahedra, breaks the chains as monovalent element, and so decreases the reticulation of the tetrahedral network. Small intensity peaks observed at about -22.83 ppm are due to Q2 pyrophosphate [27-33].

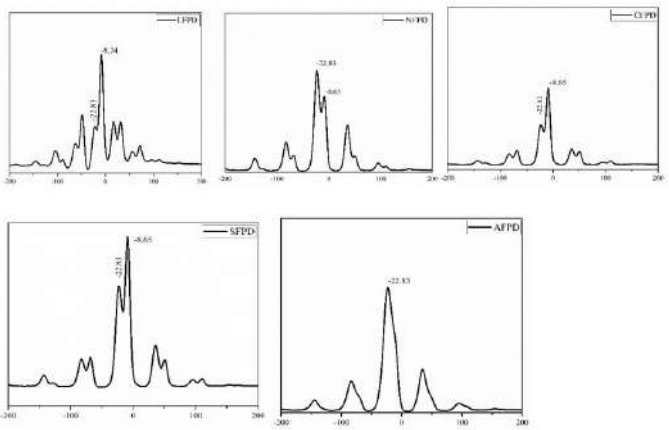

Fig 4 Chemical shifts in 31PMAS NMR spectra of Dy^{3+} doped different fluorophosphate Glasses.

Similar trend is observed in other two glass compositions namely CFPD and SFPD glasses. In the case of NFPD and AFPD glass matrices, major signal present at -22.83 ppm could be assigned to Q2 tetrahedra. This clearly indicates that structural changes have happened with the change of the cations in the fluorophosphate glass network.

Absorption spectroscopy and Judd-Ofelt theory

Absorption spectral pattern of Dy3+ doped various fluorophosphate glass matrices were recorded in the wavelength range 300-1800 nm and were shown in two separate Figs.5(a) and 5(b). The absorption bands in Dy

3+originate from the ground state 6H15/2 to different excited states. The observed band positions were assigned using the energy levels reported by Carnal *et al* [34]. In Fig 5(a) 6P7/2, 6P5/2+6P3/2, and 4F7/2 are the dominant peaks. The spectra in the NIR region revealed that the most intense band 6F11/2+6H9/2 was centred at 1278 nm. The other notable bands are 6F3/2, 6F5/2, 6F7/2 6F9/2 +6H11/2. It was observed from Fig. 5 that, the wavelengths of the absorption peaks seldom change with cation substitution.

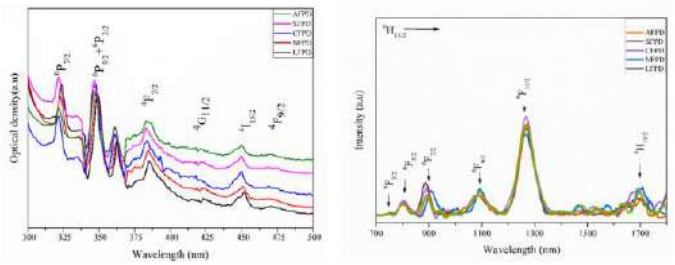

Fig 5 (a) UV-Vis and NIR optical absorption spectra of Dy^{3+} doped different fluoro phosphate glasses

Both the experimental and calculated spectral intensities (fexp, fcal) of 0.5 mol% of Dy3+ doped five glasses with root mean square deviations (δ_{rms}) were reported in Table 2. The experimental spectral intensities (fexp) for the observed absorption bands were arrived at using the equation given in Ref. [35], fexp positively depends on the area under absorption bands of different transitions. Whereas the theoretical spectral intensities (fcal) calculations were based on Judd-Ofelt (J-O) theory [36,37]. This formula includes refractive index, Lorentz local field correction term for electric dipole transition and doubly reduced matrix elements of unit tensor operator. From Table 2 it was observed that 6F11/2 band has highest spectral intensity values 5.08, 29.00, 29.39, 29.29 and 33.06 for LFPD, NFPD, CFPD, SFPD and AFPD glasses respectively. It is also observed that among different glasses, the spectral intensities of many absorption bands were higher for AFPD glass. Rms deviation is a measure of difference between values predicted by J-O theory and the values observed via experiment. Lower is the rms deviation, good and reliable the calculation process. The rms deviations for LFPD, NFPD, CFPD, SFPD and AFPD glasses were calculated, and the values were ± 0.51, $\pm$ 0.61, ± 0.71, $\pm$ 0.74, $\pm$ 0.87 respectively. This demonstrates the accuracy of Judd-Ofelt (J-O) theory and its prediction capability.

The J-O intensity parameters, $\Omega\lambda$ (λ=2, 4, 6) are widely used by the researchers to delve into short range local structure and bonding nature around rare earth ions [38]. Ω2 gives insight about asymmetry and covalency between rare earth (RE) ions and ligand ions. Ω4 and Ω6 are indicative of bulk properties such as viscosity and rigidity of the glass media. When the ambiance around Dy3+ ion has less symmetry, the field gradient environment created by ligand on the Dy3+ ion is felt and as a result the magnitude of induced f→ f transition is high. This results in greater spectral intensity. This greater spectral intensity is an indication of higher asymmetry and coordination environment around the Dy3+ ion. In order to know the influence of various cations on the local environment of Dy3+ ions, J-O intensity parameters were calculated by J-O theory and were presented in Table 3. It is observed that the change in the Ω2 parameter from lithium to aluminium in these glasses is due to the change in the covalent nature bonding environment around the dysprosium and ligand ion. It was also noticed that the decrement in the Ω2 parameter from lithium to aluminium This decrement is due to the change of effective ionic radii of lithium (0.60nm) and aluminium(0.054nm)

All the glasses commonly have displayed larger Ω2 values than Ω4 and Ω6. The pattern observed in these glasses was Ω2> Ω4> Ω6 except in NFPD glass where Ω2> Ω6> Ω4 is noticeable. It was evident from Table 3 that in the present work i.e. for 0.5mol% of Dy3+ doped fluorophosphate glasses, Ω2 parameter decreased from 18.72x10-20 cm2 to 12.04 x10-20 cm2 for Li to Al in proper order. The Ω2 values of the present work are found to be higher than CBTZnDy glasses [39], (NaPO3)6-TeO2-AlF3-LiF glasses [40] and NbLiFsDy glasses [41]. Greater Ω2value indicates greater covalency, hence LFPD glass has more covalent nature than the AFPD glass. Ω4 reflects the bulk property and viscosity. The values came out to be 5.89, 3.52, 5.17, 4.9, and 5.98 with their usual unit (x10-20cm2). For the first and the last glasses namely LFPD and AFPD were observed to have higher values. Of these AFPD has highest value. So, it is concluded that AFPD glass has high viscous nature among all glass samples. Ω6 which gives insight into rigidity is observed to have lowest value 2.45 for AFPD glass. It is known from the literature that Ω6 has inverse relation to viscosity [42]. Hence it can be concluded that AFPD glass has high rigidity.

The crux of the matter is that, the intensities of f-f transitions are usually insensitive to the glass environment. This is because of the shielding effect created by the closed shell 5s and 5p electrons. Despite this, there are some transitions whose intensities are highly sensitive to any change in the surrounding environment. These transitions are called "hypersensitive transitions". HST transitions follow the selection rules $|\Delta J| \leq 2$, $|\Delta L| \leq 2$, and $\Delta S = 0$, It has large reduced matrix elements $\|U\lambda\|2$. Usually, the changes that occur in the intensity and band shapes of HST due to the change in the environment are useful in ascertaining the changes in the structure around lanthanide ion. In the present work, 6H15/2 → 6F11/2+6H9/2 was centred at 1278 nm, higher spectral intensity of hypersensitive transition is observed for AFPD glass among all the five prepared glass compositions. This is due to the higher magnitude of the electrostatic attraction between dysprosium ion and the ligand in the said composition.

Radiative properties & Luminescence spectra

In order to calculate radiative properties like electric dipole linestrengths Sed, radiative transition probabilities, Aed, branching ratios, β and absorption cross sections, ∑ of certain excited states 4I15/2, 4F9/2, 6F3/2, 6F5/2 and 6F11/2+6H9/2 of Dy3+, J-O theory comes handy. Using this theory, these physical quantities were assessed from the absorption data and refractive indices for all the prepared Dy3+ doped FP glasses using the formulae given in ref [43-46]. The branching ratios (βR) and absorption cross-sections (∑) of certain transitions of 0.5 mol% of Dy3+ doped FP sample glasses were calculated and presented in Table 4. It was found that among different transitions, 4F9/2 → 6H13/2, transition exhibits higher branching ratio β consistently for all the samples and among all these glasses LFPD glass has highest β (83.5%) followed by CFPD glass with (76.8%).

Table 4 Certain radiative parameters of Dy^{3+} doped different fluorophosphate glasses. (Electric dipole line strengths (S_{ed}) , radiative transition probabilities (A_{ed}) sec^{-1}, branching ratios (β %) and absorption cross sections ($\sum (10^8)cm^{2}$).

Glass	Transition	S_{ed}	A_{ed}	β	∑
LFPD	$4I_{15/2}\rightarrow 6H_{15/2}$	3.19	62.67	57.00	0.06
	$4F_{9/2}\rightarrow 6H_{13/2}$	22.25	342.30	83.50	0.54
	$6F_{3/2}\rightarrow 6H_{9/2+}6H_{7/2}$	109.16	55.10	65.40	1.57
	$6F_{5/2}\rightarrow 6H_{15/2}$	156.30	73.30	46.40	1.67
	$6F_{11/2}+6H_{9/2}\rightarrow 6H_{15/2}$	469.26	190.10	91.80	3.01
NFPD	$4I_{15/2}\rightarrow 6H_{15/2}$	52.71	1036.17	55.90	1.03
	$4F_{9/2}\rightarrow 6H_{13/2}$	167.05	2613.4	67.00	4.13
	$6F_{3/2}\rightarrow 6H_{13/2}$	215.08	1405.2	32.50	7.33
	$6F_{5/2}\rightarrow 6H_{15/2}$	187.63	1755.9	37.00	5.50
	$6F_{11/2}+6H_{9/2}\rightarrow 6H_{15/2}$	3511.20	16429.5	59.60	51.45
CFPD	$4I_{15/2}\rightarrow 6H_{15/2}$	34.45	687.98	53.20	0.68
	$4F_{9/2}\rightarrow 6H_{13/2}$	176.87	2746.40	76.80	4.37
	$6F_{3/2}\rightarrow 6H_{13/2}$	70.78	466.20	25.70	2.42
	$6F_{5/2}\rightarrow 6H_{13/2}$	210.7	707.00	0.32	4.39
	$6F_{11/2}+6H_{9/2}\rightarrow 6H_{15/2}$	3631.78	1480.90	0.93	23.53
SFPD	$4I_{15/2}\rightarrow 6H_{15/2}$	52.95	978.06	63.50	0.97
	$4F_{9/2}\rightarrow 6H_{13/2}$	194.23	2847.3	74.10	4.51
	$6F_{3/2}\rightarrow 6H_{13/2}$	177.43	1097.7	41.30	5.69
	$6F_{5/2}\rightarrow 6H_{15/2}$	154.79	1365.7	43.8	4.26
	$6F_{11/2}+6H_{9/2}\rightarrow 6H_{15/2}$	3657.78	1412.5	92.8	22.36
AFPD	$4I_{15/2}\rightarrow 6H_{15/2}$	78.91	1519.48	69.00	0.50
	$4F_{9/2}\rightarrow 6H_{13/2}$	226.93	3458.10	70.90	0.17
	$6F_{3/2}\rightarrow 6H_{13/2}$	322.36	2057.40	47.50	10.75
	$6F_{5/2}\rightarrow 6H_{15/2}$	281.23	2587.20	51.90	8.09
	$6F_{11/2}+6H_{9/2}\rightarrow 6H_{15/2}$	3989.84	1582.90	91.40	25.34

The radiative transition probability (Aed) values for 6F13/2 transition came out to be 342.3, 2613.4, 2746.4, 2847.3, and 3458.1 for LFPD, NFPD, CFPD, SFPD and AFPD glasses respectively. For the aluminium glass, Aed value came out to highest. The branching ratios were consistently higher for the 4F9/2 → 6H13/2 transition [47-50].

The excitation spectra of Dy3+doped different FP glass samples were documented in the wavelength range 300 to 550 nm at an emission wavelength of 570 nm. Fig.6 shows excitation spectrum of LFPD glass matrix.

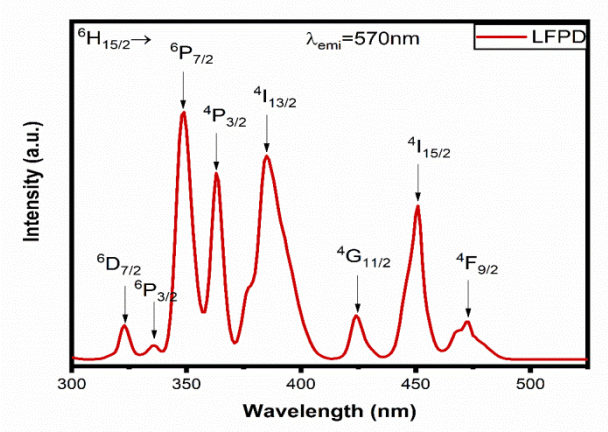

Fig 6 Excitation spectrum of Dy^{3+} doped different fluorophosphate glasses

The other spectra resembled exactly, hence we did not show them here. The excitation spectrum consists of eight inhomogeneous excitation peaks located at 325 nm, 341nm, 350 nm, 363 nm, 385 nm, 425 nm, 450 nm, and 475 nm and are related to the transitions from ground state 6H15/2 to the excited states 6D7/2, 6P3/2, 6P7/2, 4P3/2, 4I13/2, 4G11/2 and 4I15/2 and 4F9/2 respectively. Among these excitation peaks, the excitation peak at 350 nm (6H15/2→ 6P7/2) was relatively high in intensity and this was further used for the measurements of luminescence spectra [51-54].

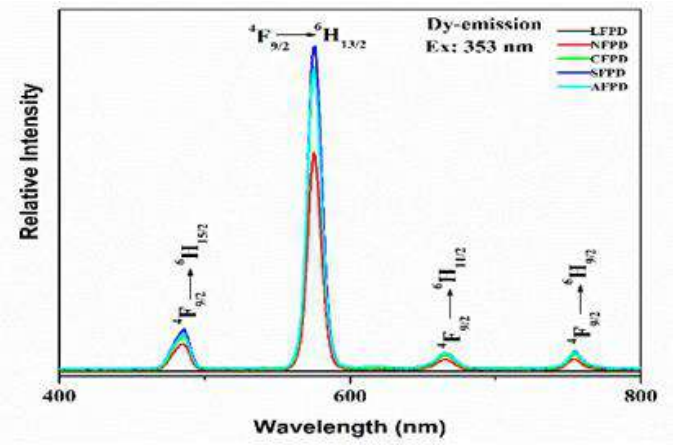

Fig 7 Emission spectra of Dy^{3+} doped different fluorophosphate glasse

Table 5 Branching ratios (β_{cal}, β_{exp}) and calculated lifetimes of certain transitions

	$4F_{9/2}\rightarrow 6H_{13/2}$	
	β_{cal}	β_{exp}
LFPD	78	81
NFPD	80	75
CFPD	81	81
SFPD	82	81
AFPD	81	83

Fig. 7 show the visible photoluminescence (PL) spectra of Dy3+ doped different fluoro phosphate glass matrices observed in the wavelength range of 400-800 nm by excitation at a wavelength(λexc) 353 nm. The emission spectra exhibiting four remarkable emission transitions of which, three in the visible range and one in NIR region 4F9/2→6HJ (J=15/2, 13/2, and 11/2) which were observed at 485, 575 and 667 nm respectively. The blue (B) emission transition (4F9/2→6H15/2) at 485 nm and yellow (Y) emission transition (4F9/2→6H13/2) at 575 nm were having high intensity than the other red emission transition (4F9/2→6H11/2) at 667 nm wavelength.

Table 6 Emission properties of Dy3+ doped different fluoroPhosphate glasses for observed transitions (peak emission wavelength, λ_p (nm), effective bandwidths, $\Delta\lambda_{eff}$ (cm-1), stimulated emission cross sections, σ_e (10-22cm2), and optical gain bandwidths, $\sigma_e \times \Delta\lambda_{eff}$ ($10^{-21}cm^3$).

Transition→	**$4F_{9/2}\rightarrow6H_{15/2}$**				**$4F_{9/2}\rightarrow6H_{13/2}$**				**$4F_{9/2}\rightarrow6H_{11/2}$**			
Glass	λ_p	$\Delta\lambda_{eff}$	σ_e	$\sigma_e\times\Delta\lambda_{eff}$	λ_p	$\Delta\lambda_{eff}$	σ_e	$\sigma_e\times\Delta\lambda_{eff}$	λ_p	$\Delta\lambda_{eff}$	σ_e	$\sigma_e\times\Delta\lambda_{eff}$
LFPD	485	13.7	1.39	19.0	575	11.3	16.46	185.9	667	14.5	3.75	54.4
NFPD	485	13.7	18.5	253.4	575	11.2	137.4	1539	667	14.9	29.1	433
CFPD	485	13.3	6.15	81.8	575	11.5	131.6	1513	667	14.5	37.2	539
SFPD	485	13.7	6.92	94.8	575	11.4	130.6	1489	667	15.0	37.3	559
AFPD	485	13.6	8.52	115.9	575	11.4	135.6	1546	667	15.2	28.9	439

The blue emission transition (4F9/2→6H15/2) was due to magnetic dipole (MD) transition, whose intensity typically does not depend on the short crystal field environment of the prepared glass matrices [55-57]. It is worth noting that the yellow emission transition (4F9/2→6H13/2) was an electric dipole (ED) transition (ΔL=2, ΔJ=2). This transition is a hypersensitive emission transition. The intensity of this transition depends on local environment.

In the present work, for 0.5 mol% of Dy3+ doped fluoro phosphate glasses, the emission intensity of the peaks increased with the increase of ionic state. The luminescence properties such as peak emission wavelengths (λP), effective bandwidths (Δveff), branching ratios (β) (experimental and calculated) and peak emission cross-sections (σP) for the three emission transitions 4F9/2→6HJ (J=15/2, 13/2, and 11/2) were calculated and were presented in Table 5. The stimulated emission cross sections which decide the threshold and efficiency for a given transition in a laser material were calculated. The highest value obtained is 16.96x10-24cm2 for AFPD glass composition. The branching ratio values of any transition are measure of lasing action. It was observed from the table that the branching ratio (β) of the emission transition 4F9/2→6H13/2 was high. It was also observed from the table that, the experimental and calculated β values were in close agreement for 4F9/2→6H13/2 which happened to be Electric dipole transition. The stimulated emission cross-section (σP) is an important measurement used to identify a medium as laser active with directly proportional relation. In the current endeavour , the peak emission cross-section (σP) was found higher for the transition 4F9/2→6H13/2 than the other two emission transitions 4F9/2→6H11/2 and 4F9/2→6H15/2. As seen from Table 5, the value of emission cross-section has increased up to 168.43x10-24cm2 with the variation of Li, Na, Ca, Sr, and Al. Hence, AFPD glass matrix can be used as viable alternative lasing material.

CIE coordinates and generation of yellowish green light

The colour of any light source can best be described and classified by three variables $\bar{x}(\lambda)$, $\bar{y}(\lambda)$ and $\bar{z}(\lambda)$ which are dimensionless quantities. To estimate the emission colour of the glass matrices, the Commission International deI'Eclairage (CIE) chromaticity coordinates are determined from the tri stimulus values using the following standard relations,

$$x = \frac{X}{X+Y+Z} \qquad y = \frac{Y}{X+Y+Z}$$

and $\bar{z}(\lambda)$ representing the relative brightness. The locus of all monochromatic colour coordinates makes the perimeter of CIE 1931 chromaticity diagram. Colour coordinates of Dy3+ doped fluoro-phosphate glass matrix with different metal cations are shown in Table.

Fig 8 represents the colour chromaticity diagram of Dy3+doped Fluoro-phosphate glasses. In the present study, x and y colour co-ordinates (0.47, 0.48) are located in the yellowish green region for all the glass matrices

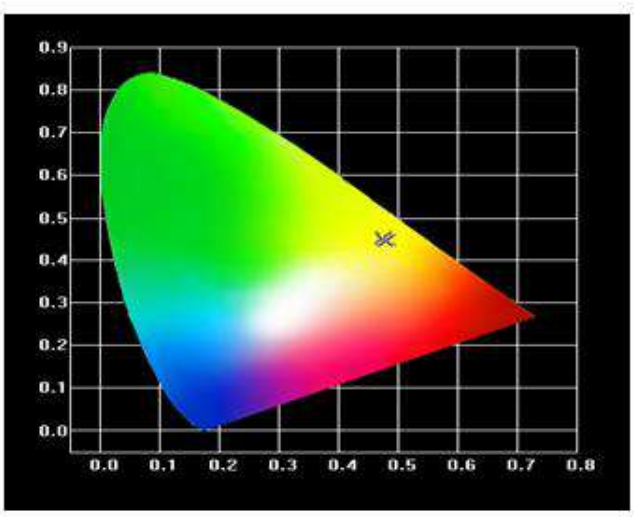

Fig 8 CIE chromaticity diagram for of Dy^{3+} doped different fluorophosphate glasses

From the emission spectra of Dy3+ doped FP glasses, yellow to blue transitions ratio (Y/B) values were calculated and were presented in Table 6. These values were 1.91, 1.80, 1.82, 1.78 and 1.76 for LFPD, NFPD, CFPD, SFPD and AFPD glasses respectively. Higher the value of Y/B ratio indicates higher degree of covalency. From the values of Y/B ratios, it was noticed that LFPD glass matrix has higher degree of covalency [58-59].

Table 7 The calculated chromaticity colour co-ordinates (x, y), CCT and Y/B ratio values of Dy3+ ions activated FP glasses excited at a wavelength of 353 nm.

Sample	**Color coordinates (x, y)**	**CCT (k)**	**Y/B**
LFPD	(0.486, 0.457)	2702	1.91
NFPD	(0.473, 0.456)	2855	1.80
CFPD	(0.472, 0.451)	2834	1.82
SFPD	(0.466, 0.446)	3012	1.78
AFPD	(0.465, 0.456)	2960	1.76

CONCLUSIONS

Different alkali alkaline and aluminium fluorophosphate glasses with 0.5mol% Dy3+ doping, were produced by melt quenching process. These glass samples were characterized by XRD, FT-IR, FT-RAMAN, 31P MAS NMR, Optical absorption, luminescence, and emission measurements. The XRD has reaffirmed the amorphous nature of prepared glass samples. The various structural groups present in the prepared glass samples were identified by FTIR and FT Raman. From 31P MAS NMR spectra, it was detected the presence of meta

phosphate units, and pyrophosphate structures in the sample. J-O intensity Ωλ (λ=2, 4 and 6) parameters and radiative parameters (AT, τR, β and Σ) were calculated for prepared fluorophosphate glasses. Among the three intensity parameters, LFPD glass matrix had higher magnitude (18.72x10-20 cm2) of Ω2 parameter which could be attributed to higher covalency and higher asymmetry of ligand field around the Dy3+ ion. AFPD glass has exhibited lower Ω2 value (12.04 x10-20 cm2). From Li to Al the Ω2 values have decreased indicating decrease in covalency nature and increase in ionic nature. The Y/B values corroborate this conclusion. This could be due to increase in the charge of cation that replaced earlier one. Ω4 and Ω6 which reflect the bulk properties such as viscosity and rigidity of the glass matrix have scattered values. Emission properties of all the excited levels of Dy3+ were studied. Branching ratio values which play an important role in attaining stimulated emission were found to be higher for the transition 4F9/2→6H13/2 of LFPD glass matrix (83.5%). So, it is useful for laser applications. From the colour chromaticity diagram, it was concluded that these glasses are quite suitable for greenish yellow emission.

Declaration of Competing Interests

Title of Manuscript: "Delving into the Spectroscopic properties of Dy3+in different fluorophosphate glasses for multitude of applications

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The authors declare that, they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. We have authority over manuscript preparation and decisions to submit the manuscript for publication.

References

1. Babu, S. Surendra, P. Babu, C. K. Jayasankar, Th Tröster, W. Sievers, and G. Wortmann. "Optical properties of Dy3+-doped phosphate and fluorophosphate glasses." *Optical materials* 31, no. 4 (2009): 624-631.
2. Puppalwar, S. P., and S. J. Dhoble. "Photoluminescence properties of LiBaPO4: M3+ phosphor for near-UV light-emitting diode (M= Eu and Dy)." *Luminescence* 30, no. 6 (2015): 745-750.
3. Sharma, Ritu, and A. S. Rao. "Photoluminescence investigations on Dy3+ ions doped Zinc Lead Tungsten Tellurite glasses for optoelectronic devices." *Journal of Non-Crystalline Solids* 495 (2018): 85-94.
4. Sidek, H. A. A., H. B. Senin, G. A. Saunders, D. Ball, M. Cankurtaran, and M. Federico. "Elastic, anelastic and nonlinear acoustic properties of (ZnCl2) x (P2O5) 1–x glasses." *Physics and chemistry of glasses* 39, no. 1 (1998): 17-22.
5. Hall, D. W., Mark A. Newhouse, Nicholas F. Borrelli, W. Hl Dumbaugh, and D. L. Weidman. "Nonlinear optical susceptibilities of high-index glasses." *Applied Physics Letters* 54, no. 14 (1989): 1293-1295.
6. Sebastian, Jismon, Subash Gopi, E. Sreeja, Adon Jose, T. Krishnapriya, and P. R. Biju. "Luminescence characteristics of Dy3+ doped boro fluoro-phosphate glasses for white emission applications." In *AIP Conference Proceedings*, vol. 2269, no. 1, p. 030057. AIP Publishing LLC, 2020.
7. Babu, S. Surendra, P. Babu, C. K. Jayasankar, Th Tröster, W. Sievers, and G. Wortmann. "Optical properties of Dy3+-doped phosphate and fluorophosphate glasses." *Optical materials* 31, no. 4 (2009): 624-631.
8. Jayasimhadri, M., Kiwan Jang, Ho Sueb Lee, Baojiu Chen, Soung-Soo Yi, and Jung-Hyun Jeong. "White light generation from Dy 3+-doped ZnO–B 2 O 3–P 2 O 5 glasses." *Journal of Applied Physics* 106, no. 1 (2009): 013105.
9. Campbell, J. H., and T. I. Suratwala. "Nd-doped phosphate glasses for high-energy/high-peak-power lasers." *Journal of non-crystalline solids* 263 (2000): 318-341.
10. Linganna, K., Ch Srinivasa Rao, and C. K. Jayasankar. "Optical properties and generation of white light in Dy3+-doped lead phosphate glasses." *Journal of Quantitative Spectroscopy and Radiative Transfer* 118 (2013): 40-48.
11. Massera, J., M. Gaussiran, P. Gluchowski, M. Lastusaari, L. Hupa, and LJJotECS Petit. "Processing and characterization of phosphate glasses containing CaAl2O4: Eu2+, Nd3+ and SrAl2O4: Eu2+, Dy3+ microparticles." *Journal of the European Ceramic Society* 35, no. 14 (2015): 3863-3871.
12. Meejitpaisan, Piyachat, Chittra Kedkaew, C. K. Jayasankar, and Jakrapong Kaewkhao. "Spectral Investigations of Dy3+-Doped Gd2O3-CaO-P2O5 Glasses." In *Key Engineering Materials*, vol. 675, pp. 384-388. Trans Tech Publications Ltd, 2016.
13. Kesavulu, C. R., and C. K. Jayasankar. "White light emission in Dy3+-doped lead fluorophosphate glasses." *Materials Chemistry and Physics* 130, no. 3 (2011): 1078-1085.
14. Galleani, Gustavo, Silvia Helena Santagneli, Younes Messaddeq, Marcos De Oliveira, and Hellmut Eckert. "Rare-earth doped fluoride phosphate glasses: structural foundations of their luminescence properties." *Physical Chemistry Chemical Physics* 19, no. 32 (2017): 21612-21624.
15. Pisarski, Wojciech A., Lidia Żur, and Joanna Pisarska. "Optical transitions of Eu 3+ and Dy 3+ ions in lead phosphate glasses." *Optics letters* 36, no. 6 (2011): 990-992.
16. Sidek, H. A. A., M. Hamezan, A. W. Zaidan, Z. A. Talib, and K. Kaida. "Optical characterization of lead-bismuth phosphate glasses." *Am J Appl Sci* 2, no. 8 (2005): 1266-9.
17. Pan, Chengsi, and Yongfa Zhu. "Size-controlled synthesis of BiPO 4 nanocrystals for enhanced photocatalytic performance." *Journal of Materials Chemistry* 21, no. 12 (2011): 4235-4241.
18. Basavapoornima, Ch, C. K. Jayasankar, and P. P. Chandrachoodan. "Luminescence and laser transition studies of Dy3+: K–Mg–Al fluorophosphate glasses." *Physica B: Condensed Matter* 404, no. 2 (2009): 235-242.
19. Zhao, Wang, Weiwei Zhou, Mingjun Song, GuoFu Wang, Jianming Du, Haijun Yu, and Jingxia Chen. "Spectroscopic investigation of Dy3+-doped Li2Gd4 (MoO4) 7 crystal for potential application in solid-state yellow laser." *Journal of alloys and compounds* 509, no. 9 (2011): 3937-3942.

20. Dominiak-Dzik, G., W. Ryba-Romanowski, R. Lisiecki, P. Solarz, and M. Berkowski. "Dy-doped Lu2SiO5 single crystal: spectroscopic characteristics and luminescence dynamics." *Applied Physics B* 99, no. 1 (2010): 285-297.
21. Babu, S., A. Balakrishna, D. Rajesh, and Y. C. Ratnakaram. "Investigations on luminescence performance of Sm3+ ions activated in multi-component fluoro-phosphate glasses." *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 122 (2014): 639-648.
22. Shapaan, M., S. A. El-Badry, A. G. Mostafa, M. Y. Hassaan, and M. H. Hazzaa. "Structural and electric-dielectric properties of some bismuth-phosphate glasses." *Journal of Physics and Chemistry of Solids* 73, no. 3 (2012): 407-417.
23. Selvi, Structural, Godugunuru Venkataiah, S. Arunkumar, G. Muralidharan, and K. Marimuthu. "Structural and luminescence studies on Dy3+ doped lead boro–telluro-phosphate glasses." *Physica B: Condensed Matter* 454 (2014): 72-81.
24. Marzouk, M. A., F. H. ElBatal, and A. M. Abdelghany. "Ultraviolet and infrared absorption spectra of Cr2O3 doped–Sodium metaphosphate, lead metaphosphate and zinc metaphosphate glasses and effects of gamma irradiation: A comparative study." *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 114 (2013): 658-667.
25. Kumar, N. Manoj, G. Venkateswara Rao, B. E. Akhila, and H. D. Shashikala. "Effect of CaF 2 addition on optical properties of barium phosphate glasses." In *AIP Conference Proceedings*, vol. 1591, no. 1, pp. 733-735. American Institute of Physics, 2014.
26. Moustafa, Y. M., and K. El-Egili. "Infrared spectra of sodium phosphate glasses." *Journal of non-crystalline solids* 240, no. 1-3 (1998): 144-153.
27. Brow, Richard K., R. James Kirkpatrick, and Gary L. Turner. "The short range structure of sodium phosphate glasses I. MAS NMR studies." *Journal of Non-crystalline solids* 116, no. 1 (1990): 39-45.
28. Brow, Richard K., David R. Tallant, Sharon T. Myers, and Carol C. Phifer. "The short-range structure of zinc polyphosphate glass." *Journal of Non-Crystalline Solids* 191, no. 1-2 (1995): 45-55.
29. Krishnaiah, Kummara Venkata, Kagola Upendra Kumar, and Chalicheemalapalli Kulala Jayasankar. "Spectroscopic properties of Dy3+-doped oxyfluoride glasses for white light emitting diodes." *Materials Express* 3, no. 1 (2013): 61-70.
30. Lodi, T. A., N. F. Dantas, T. S. Gonçalves, A. S. S. De Camargo, F. Pedrochi, and A. Steimacher. "Dy3+ doped calcium boroaluminate glasses and Blue Led for smart white light generation." *Journal of Luminescence* 207 (2019): 378-385.
31. Kiani, Azadeh, Lindsay S. Cahill, Ensanya Ali Abou Neel, John V. Hanna, Mark E. Smith, and Jonathan C. Knowles. "Physical properties and MAS-NMR studies of titanium phosphate-based glasses." *Materials Chemistry and Physics* 120, no. 1 (2010): 68-74.
32. Cui, S., J. Massera, M. Lastusaari, L. Hupa, and L. Petit. "Novel oxyfluorophosphate glasses and glass-ceramics." *Journal of Non-Crystalline Solids* 445 (2016): 40-44.
33. Tian, Ying, Junjie Zhang, Xufeng Jing, and Shiqing Xu. "Optical absorption and near infrared emissions of Nd3+ doped fluorophosphate glass." *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 98 (2012): 355-358.
34. Carnall, W. T., P. R. Fields, and K. Rajnak. "Spectral intensities of the trivalent lanthanides and actinides in solution. II. Pm3+, Sm3+, Eu3+, Gd3+, Tb3+, Dy3+, and Ho3+." *The journal of chemical physics* 49, no. 10 (1968): 4412-4423.
35. Rajesh, D., Y. C. Ratnakaram, M. Seshadri, A. Balakrishna, and T. Satya Krishna. "Structural and luminescence properties of Dy3+ ion in strontium lithium bismuth borate glasses." *Journal of luminescence* 132, no. 3 (2012): 841-849.
36. Judd, Brian R. "Optical absorption intensities of rare-earth ions." *Physical review* 127, no. 3 (1962): 750.
37. Ofelt, G. S. "Intensities of crystal spectra of rare-earth ions." *The journal of chemical physics* 37, no. 3 (1962): 511-520.
38. Takasaki, Hisako, Setsuhisa TANABE, and Teiichi HANADA. "Long-lasting afterglow characteristics of Eu, Dy codoped SrO-Al2O3 phosphor." *Journal of the Ceramic Society of Japan* 104, no. 1208 (1996): 322-326.
39. Jørgensen, Chr Klixbüll, and B. R. Judd. "Hypersensitive pseudo quadrupole transitions in lanthanides." *Molecular Physics* 8, no. 3 (1964): 281-290.
40. Duffy, J. A., and Malcolm D. Ingram. "An interpretation of glass chemistry in terms of the optical basicity concept." *Journal of Non-Crystalline Solids* 21, no. 3 (1976): 373-410.
41. Tian, Ying, Junjie Zhang, Xufeng Jing, and Shiqing Xu. "Optical absorption and near infrared emissions of Nd3+ doped fluorophosphate glass." *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 98 (2012): 355-358.
42. Tian, Ying, Junjie Zhang, Xufeng Jing, and Shiqing Xu. "Optical absorption and near infrared emissions of Nd3+ doped fluorophosphate glass." *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 98 (2012): 355-358.
43. Yamusa, Y. A., R. Hussin, and WN Wan Shamsuri. "Effect of Dy 3+ on the physical, optical and radiative properties of CaSO 4–B 2 O 3–P 2 O 5 glasses." *Indian Journal of Physics* 93 (2019): 15-26.
44. Karunakaran, R. T., K. Marimuthu, S. Surendra Babu, and S. Arumugam. "Dysprosium doped alkali fluoroborate glasses—Thermal, structural and optical investigations." *Journal of luminescence* 130, no. 6 (2010): 1067-1072.
45. Babu, S., V. Reddy Prasad, D. Rajesh, and Y. C. Ratnakaram. "Luminescence properties of Dy3+ doped different fluoro-phosphate glasses for solid state lighting applications." *Journal of Molecular Structure* 1080 (2015): 153-161.
46. Van Do, Phan, Vu Phi Tuyen, Vu Xuan Quang, Nguyen Trong Thanh, Vu Thi Thai Ha, Ho Van Tuyen, Nicholas M. Khaidukov, Julián Marcazzó, Yong-Ill Lee, and Bui The Huy. "Optical properties and Judd–Ofelt parameters of Dy3+ doped K2GdF5 single crystal." *Optical Materials* 35, no. 9 (2013): 1636-1641.

47. Hormadaly, J., and R. Reisfeld. "Intensity parameters and laser analysis of Pr3+ and Dy3+ in oxide glasses." *Journal of Non-Crystalline Solids* 30, no. 3 (1979): 337-348.
48. Mahamuda, Sk, K. Swapna, P. Packiyaraj, A. Srinivasa Rao, and G. Vijaya Prakash. "Lasing potentialities and white light generation capabilities of Dy3+ doped oxy-fluoroborate glasses." *Journal of luminescence* 153 (2014): 382-392.
49. Amjad, Raja J., M. R. Sahar, S. K. Ghoshal, M. R. Dousti, and R. Arifin. "Synthesis and characterization of Dy3+ doped zinc–lead-phosphate glass." *Optical materials* 35, no. 5 (2013): 1103-1108.
50. Reddy, A. Amarnath, M. Chandra Sekhar, K. Pradeesh, S. Surendra Babu, and G. Vijaya Prakash. "Optical properties of Dy3+-doped sodium–aluminum–phosphate glasses." *Journal of Materials Science* 46, no. 7 (2011): 2018-2023.
51. Swapna, K., Sk Mahamuda, A. Srinivasa Rao, M. Jayasimhadri, T. Sasikala, and L. Rama Moorthy. "Optical absorption and luminescence characteristics of Dy3+ doped Zinc Alumino Bismuth Borate glasses for lasing materials and white LEDs." *Journal of luminescence* 139 (2013): 119-124.
52. Ryba-Romanowski, W., G. Dominiak-Dzik, P. Solarz, and R. Lisiecki. "Transition intensities and excited state relaxation dynamics of Dy3+ in crystals and glasses: A comparative study." *Optical Materials* 31, no. 11 (2009): 1547-1554.
53. Kaminskii, Alexander A., John B. Gruber, Sergei N. Bagaev, Ken-ichi Ueda, Uwe Hömmerich, Jae Tae Seo, Doyle Temple *et al*. "Optical spectroscopy and visible stimulated emission of Dy 3+ ions in monoclinic α− KY (WO 4) 2 and α− KGd (WO 4) 2 crystals." *Physical Review B* 65, no. 12 (2002): 125108.
54. Shivakumara, C., Rohit Saraf, and Pramod Halappa. "White luminescence in Dy3+ doped BiOCl phosphors and their Judd–Ofelt analysis." *Dyes and Pigments* 126 (2016): 154-164.
55. Ghosh, Arnab, and Radhaballabh Debnath. "Judd–Ofelt analysis of Er+ 3 activated lead free fluoro–tellurite glass." *Optical Materials* 31, no. 4 (2009): 604-608.
56. Lu, Xiuai, Zhenyu You, Jianfu Li, Zhaojie Zhu, Guohua Jia, Baichang Wu, and Chaoyang Tu. "The optical properties of Dy3+-doped NaY (MoOT) 2 crystal." *Journal of luminescence* 126, no. 1 (2007): 63-67.
57. Sajna, M. S., Sunil Thomas, C. Jayakrishnan, Cyriac Joseph, P. R. Biju, and N. V. Unnikrishnan. "NIR emission studies and dielectric properties of Er3+-doped multicomponent tellurite glasses." *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 161 (2016): 130-137.
58. Narwal, P., Manjeet S. Dahiya, A. Yadav, A. Hooda, A. Agarwal, and S. Khasa. "Improved white light emission in Dy3+ doped LiF–CaO–Bi2O3–B2O3 glasses." *Journal of Non-Crystalline Solids* 498 (2018): 470-479.
59. Kumar, M., R. P. Vijayalakshmi, and Y. C. Ratnakaram. "Investigation of structural and optical properties of Pr3+ doped and Pr3+/Dy3+ co-doped multicomponent bismuth phosphate glasses for visible light applications." *Journal of Molecular Structure* (2022): 133333.

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THE EFFECTS OF PREBIOTICS AND PROBIOTICS ON ANXIETY, DEPRESSION AND SUICIDAL IDEATION WITH SPECIAL REFERENCE TO ADOLESCENTS A REVIEW

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Abstract

It is long understood that the GI microbiota with their varied microbial communities play important role in various metabolic, protective and immunological processes of the body. Prebiotics and Probiotics take part in the neuro-immune processes that directly influence the mental wellbeing. It is now established that the metabolites produced by the digestion and the consequent fermentation of the nutrients of prebiotics produce anti-inflammatory, antidepressant and anti-anxiety effects on the CNS. Research has indicated that imbalance of the gut bacteria negatively influences mental health. The study of the effects of pathophysiology of mental disorders especially in the perspective of microbiota communications is an emerging and promising field. It is an area of intense research with concepts such as the use of psychobiotics to positively influence the gut. It has been proven that cultures of gut bacteria such as Lactobacillus, Bifidobacterium and Enterococcus are capable of producing neuropeptides and neurotransmitters including GABA, serotonin and BDNF which can be directly discharged in to the brain, thus enhancing their availability. Both human and animal research indicates that adolescence is a sensitive period during with the balance between gut-brain axis is finetuned. Therefore, proper understanding of the methods of influence that probiotics take to influence mind offers a new and a safer pathway for treatment. Depressive disorders and anxiety disorders are commonly found during adolescence along with suicidal ideation. Careful manipulation of the microbiome through psychobiotics in advantage to their cultural prevalence in the form of fermented foods, hopefully leads to more acceptability than the classical drugs which often show low level adherence. It is easy to overlook food habits in relation to prevalence of mental disorders with the influence of globalization and high consumption of processed foods. Even though the complex pathways between gut and brain are not fully understood, it is essential to recognize the importance of food habits along with the presence of prebiotics and probiotics in the diet for overall wellbeing.

Keywords: Prebiotics, Probiotics, Psychobiotics, Gut biome, Depression, Anxiety, Suicide, Adolescence, Food, Nutrition

Introduction:

A psychological disorder is a pattern of behavioural or psychological symptoms characterized by a clinically significant disturbance of an individual's cognitive, behavioural and emotional regulation and is usually observed as distress in the social, occupational or other important activities of the individual. [1] It is estimated that nearly 10% of Indian adolescents are likely to suffer from some degree of mental health issues.[2] Though adolescents comprise one fifth of the population of India, there is little research on their mental health.[3]

Adolescents confront a rapidly changing and challenging social environments as well as their rapid physical changes in the body. Their identity, cultural beliefs, support structures, family system, peer relationships and educational opportunities mould their behaviour and personality. The rapidly changing value systems and increasing expectations combined with forces of globalization adversely influence the mental health of the adolescents.

Despite these factors, very little is acknowledged by the parents and adolescents regarding the status of mental health. In India, despite advances in education and awareness, a diagnosis of a psychological problem and consulting the psychiatrist is still seen as a stigma leading to certain discrimination. Parents also often, in fear, wish to deny the condition and associate it with the child's

temperament rather than admitting any possibility of suffering from mental disorder. Oftentimes, medical intervention is avoided from the lack of awareness amongst young people and parents. The prevalence and popularity of unproven alternatives along with religious dogmas in India also poses a threat to the scientific and rational approach to mental health.

Research has indicated high prevalence of anxiety disorder, depressive disorder, ADHD disorders and behavioural disorders amongst adolescents of the country. It has also been indicated that the urban adolescents are more prone to mental disorders when compared to rural adolescents. One factor amongst many is the rapid and extreme changes in diet and nutrition of the urban adolescents with access to highly processed foods.

In these scenarios, the importance of prebiotics and probiotics is garnering prominence as a non-stigmatized yet effective and proven alternative to classical treatment to disorders. The use of psyhcobiotics through dietary intervention is seen with lesser resistance and more adherence amongst the young. While research in this comparatively new domain of alternative treatment has gained more focus, and young patients seem very optimistic about the prospects of prebiotics and probiotics as these young patients consider it as an innovative, approachable, affordable and a more socially acceptable intervention to mental disorders.[4]

A vast majority of scientist have now accepted that the diverse microfauna present in our intestines may have a strong influence on mood and therefore brain. The gut-brain axis is observed to be a bidirectional balance with the brain's gastrointestinal and immune functions that influence the diversity of the gut's microbiome, and gut microbes in return produce neuroactive compounds, including neurotransmitters that influence the brain.These gut-brain interactions are supposed to occur in various ways: microbial compounds are observed to communicate via the vagus nerve connecting the brain and the digestive tract, and through immune system, which coordinates through its own communication network with brain, by producing metabolites.[5]

This paper attempts to review and compile the various studies that explored the efficacy of prebiotics and probiotics on mental health and their popularity in the youth. The paper also contemplates on the possible pathways of inclusion of psychobiotics into classical treatments to mental disorders in context to Indian society.

Method:

In order to understand the current research scenario on prebiotics and probiotics as a treatment for psychotic disorders, a total of 15 research papers were studied. Papers that dealt with probiotics as a treatment option for physiological disorders were not considered for the review. Apart from the thus selected papers, articles that dealt with the scope and future of prebiotics were also considered in the study to develop a holistic idea on the current status of the prebiotics and probiotics market.

DISCUSSION:

The human gut contains more bacterial organisms than total eukaryotic cells in the body. This collection of bacteria referred commonly as gut microbiome or gut flora is said to representa virtual organ with metabolic activity surpassing that of the liver. The genome of the microbiome of this entire gut flora is more diverse than the entire human genome. Some bacterial species of this gut flora have demonstrated that they can positively influence the health of the host. These species of the gut flora are defined as probiotics and have proven to be beneficial in reducing inflammation and provide protection against gut associated bacterial infections.[7]Apart from positively influencing the physical health, they are also identified to influence the mental health of the host body. Probiotic microorganisms are thought change the CNS biochemistry by affecting the availability of various neurotransmitters including GABA and Dopamine. Some of the species that have been identified to influence mood include *Bifidobacterium, Lactobacillus and Enterococcus* and are therefore useful in creating anxiolytic and anti-depressant effect.[8]

Prebiotics are defined as indigestible or semi-digestible compounds that can selectively influence the growth, activity and or population of useful bacteria or probiotic organisms in the gut flora. The main

category of prebiotics includes starches such as fructo-oligosaccharides (FOS) and galacto-oligosaccharides (GOS) which are resistant to the digestive enzymes and can therefore reach the colon where they are processed by the prebiotic organisms.[8] Prebiotics such ass inulin and pectin have been used to treat intestinal disorders and are claimed to decrease the risks of cardiovascular disease and obesity. [9] Moreover, it has been observed that oligosaccharides present in the milk can reduce symptoms of stress and anxiety like behaviour in mice. Similarly, it has been proven that FOS and GOS mixtures can have an anti-depressant effect on mice. (Better Gut microbiome function)
While the exact pathways that prebiotics and probiotics take to influence mental health are still being studied, it is important to understand the potential that prebiotics and probiotics carry as a way to influence mental health in a positive manner. Probiotics have already been proven useful in various auto-immune inflammatory diseases, however, their use as 'psychotics' has at best been limited to studies. However, the presence of prebiotics compounds and probiotic microorganisms in cultural cuisines of all major cultures. Their presence and utilization are widespread in the cuisines of South East Asia. Probiotics can be found naturally in a assorted variety of food products such as curd, kefir, tempeh, sauerkraut, miso, some cheeses,buttermilk etc.[9] which are widely used in the kitchens of India. With the increasing knowledge of the relationship between diet and health, a lot of food companies have begun to include prebiotic compounds or even produce probiotic supplements. On the other hand, as the usage of antibiotics grows, their harmful effects on the gut flora are also considered during antibiotic treatment, hence many doctors today prescribe probiotics as a way to balance the gut flora after antibiotic use. Therefore, though prebiotics and probiotics are popular as health foods, they are not considered as major treatment options for psychiatric disorders.

Adolescence and Mental Health

According to some estimated, depression and anxiety affect up to 300 million people worldwide with an increase annually. It is estimated that over 85% of the affected sufferwith one or have had experienced the symptoms of the other. They combinedly increase the risk of suicidal ideation and suicide as well as lead to psychological and social impairment.[14] The proportion of the global population with anxiety disorders is estimated to be 3.6%. Depression is ranked by the WHO Report as the single largest contributor to global disability as 7.5% of all people with a disability in 2015, whereas anxiety disorders are ranked 6th (3.4%)[8]
Apart from these life debilitating disorders, suicide thoughts and behaviours are major health problems that can have distressing impact on individuals, families and communities. Suicide accounts for an estimated one million annual deaths which is more than the annual deaths caused by homicide, AIDs and car accidents. It is also estimated that every year 25 million suicide attempts are made worldwide.[15]
In the case of adolescents, there has been an increasing presence of psychiatric disorders. In USA alone, at least one in five youth aged 9–17 years at present has a diagnosable mental health disorder leading to some degree of impairment either in social or academic functions; one in 10 adolescents suffer significant impairment due to these disorders. The most common psychiatric disorders prevalent amongst adolescents are anxiety, mood, attention, and behaviour disorders.[10] Suicide ideation and suicide attempts are the most prevalent health emergencies among adolescents.[11]According to a report by American College of Obstetricians and Gynaecologists, suicide is the second leading cause of death in young people aged 15–24 years.[10]
In Indian adolescents, the situation is far worse. As overserved in the study by Aravind Pillai et al., Young people (aged 10–19 years) make up for a fifth of India's total population with nearly 230 million people. While, the focus on adolescents' health and wellbeing has garnered increased significance in governmental and social policies related to public health, the emphasis has been on more reproductive and sexual health rather than mental wellbeing. While many studies indicate that suicide in young Indians is the leading cause of death, adolescent mental health has never been the prime focus of action plans of neither the government nor social structures. The research in this arena has only recently gained momentum with some published studies dealing with adolescent Indians as

samples have reported prevalence of mental disorders ranging from 2.6% to 35.6% causing a significant discussion in the scientific and health communities.[3]
In a study conducted by Neena Sawant on Indian youth's mental health, she observed the urgency awareness amongst parents and health care providers about the extent of the psychological problems in children. She observed that many commonmental health conditions arise during childhood therefore demand attention from both parents and paediatricians. These ensuing psychosocial problems are the root to various and rather widely prevalent learning and emotional difficulties of Indian children. Parents too are often in denial of their child's psychiatric disorder in fear of social stigma, thus unknowingly causing more stress and trauma to child.[12]
Adolescents face rapid shift in their roles and as well as their perceptions of their social and physical environments. Their belief systems, familyand support constructs as well as social relationships and academic expectations influence their behaviour and demand fast rate of adjustment. Globalisation is also considered as a major factor in leading these rapid changes of the otherwise stable sociocultural systems in low and middleincome countries, and this sudden changes in expectations from adolescents as well as realization of fluctuating social forces may increase the risk of development of mood and anxiety disorders.[13] Adolescents with mood disorders exhibit more irritability compared to adults with mood disorders. They also tend to frequently engage in self-medication with alcohol and other substances, and are prone to more impulsive behaviours including self-harm and suicide.
A majority of these affected individuals are treated with pharmacological treatments and behavioural therapies. However, it has been observed that despite the widespread use of antidepressants, there are an increasing number of studies that question the efficacy of these drugs. There are also growing concerns over the serious and non-serious adverse side effects associated with these drugs. Moreover, the success rate of these treatments is very low (with some studies reporting as low as 50% efficacy) while some treatments yield improved results but it also oftentimes results in the increased risk of development of side effects due to prolonged use of these medications.

Prebiotics and Probiotics as an adjuvant

In this context, probiotics can be safe and natural adjuvant therapeutic strategy in combination with existing therapies to lessen the burden of depression without the dangers of side effects. Therefore, select strains of commensal and probiotic bacteria can be utilized to gut–microbe-brain axis communication, influencing the behaviour of the host.
Probiotics are proven to be capable of releasing neuroactive substances.[4]As mentioned above, strains of *Bifidobacterium* family can increase the expression of GABA in the brain, while strains of *Streptococcus* and *Enterococcus* are linked with the production of serotonin, the key modulator of sleep. The imbalance of these neurotransmitters is seen as the cause of many mood disorders and are key players in suicidal ideation. A study found that the effect of probiotic interventions to enhance serotonin come apparent in about 4 weeks which is comparable to the common serotonin reuptake inhibitor (SSRIs) drugs used to treat depression. Furthermore, even when they start to affect the mood, the side effects associated cause more than 25% of the patients to discontinue their treatment, when not factoring in the social stigma and fear associated with antidepressants.
The potential of probiotics to be used as a treatment for disorders such as depression and anxiety can have a major impact on both psychiatry and nutrition. While the recent hype of the prebiotics and probiotics has warranted the necessary attention from the public, the clinical effects of prebiotics and the efficacy of these alternatives along with metrics such as strains, dosage and duration of the interventions is necessary. However, it is anticipated that as the significance of these research grows, adolescents' food habits can be monitored and modified towards a better mental health without the need for lifelong prescription to antidepressants and antipsychotics.

Conclusion:

The way our physiological processes have become aligned, dependent and intertwined with gut microbiota is fascinating. Though, we share a mutual relationship with gut microbiota, it is as if we

are piloted by our gut. Gut microbes play key roles in neural development as well as forming an immunity since early stages of childhood and continue to exert influence on our psychological and immunological states throughout our lives. Thus, probiotics that are known to positively affect neuroendocrine signalling and immunological functions can be utilized as psychobiotics. With new technological advances in our disposal, such as genetic engineering, we can develop these psychoactive bacteria to be more efficient and robust to be used as an optionfor management or treatment of depressive and neurodegenerative disorders. The research has already established the manipulation of the human microbiota through prebiotics and probioticscan alleviate symptoms of gut related diseasesand are being recommended as to prevent the side effects of antibiotics on gut, as evidenced by the presence of growing prebiotic and probiotic market. With more 350 million people worldwide suffering from depression or mood disorders there is an overwhelming urgency to make the treatment safer and affordable than the existing medication and therapy options. This review indicates that treatment with probiotics may improve symptoms associated with depression by enhancing the availability of the neurotransmitter serotonin as well as reducing the inflammatory markers in the brain and body. The potentials of probiotics to be used as a novel treatment for psychiatric disorders will have a positive effect on those that require antidepressant treatment without the burden of social stigma, adherence and side effects associated with typical antidepressants. However, it must be noted that despite extensive preclinical data and animal trails, the clinical properties of probiotics on mental health have yet to be studied comprehensive manner through a sample of depressed individuals with various parameters to establish them as alternatives to conventional drugs. Further research is therefore necessary to determine the efficacy of probiotics and prebiotics in alleviating symptoms in a practically feasible manner as well as the ideal duration of treatment, dosage, and optimum strain of probiotic for achieving the necessary efficacy in comparison to the conventional drugs.

References:

1. Chen D, Yang X, Yang J, Lai G, Yong T, Tang X, Shuai O, Zhou G, Xie Y, Wu Q. Prebiotic effect of fructooligosaccharides from Morinda officinalis on Alzheimer's disease in rodent models by targeting the microbiota-gut-brain axis. Frontiers in aging neuroscience 2017; 9: 403
2. Bharath Kumar Reddy K.R, Asthik Biswas, Harini Rao. Assessment of Mental Health of Indian Adolescents Studying in Urban Schools. Malaysian Journal of Paediatrics and Child Health, Vol. 17 (2), December 2011: 35-40
3. Aravind Pillai, Vikram Patel, Percy Cardozo, Robert Goodman, Helen A. Weiss and Gracy Andrew. Non-traditional lifestyles and prevalence of mental disorders in adolescents in Goa, India. The British Journal of Psychiatry (2008) 192, 45–51. doi: 10.1192/bjp.bp.106.034223
4. Kathrin Cohen Kadosh, Melissa Basso, Paul Knytl, Nicola Johnstone, Jennifer Y F Lau, Glenn Gibson. Active ingredient 'Better gut microbiome function'. medRxiv 2020.11.09.20228445; doi: https://doi.org/10.1101/2020.11.09.20228445
5. Gibson, G., Hutkins, R., Sanders, M. et al. Expert consensus document: The International Scientific Association for Probiotics and Prebiotics (ISAPP) consensus statement on the definition and scope of prebiotics. Nat Rev Gastroenterol Hepatol **14,** 491–502 (2017). https://doi.org/10.1038/nrgastro.2017.75
6. Rieder, R., Wisniewski, P. J., Alderman, B. L. and Campbell, S. C. (2017). Microbes and mental health: a review. Brain, behavior, and immunity, 66, 9-17.
7. Ro Y D. Slea Tor and Colin Hill Patho-biotechnology; using bad bugs to make good bugs better Science Progress 90(1), 1-14, (2007)
8. Pourjafar, Hadi& Ansari, Fereshteh. The Effects of Prebiotics and Probiotics on Mental Disorders. (2020)
9. Sharma et al. Awareness and Knowledge about Probiotics among College Students Journal of Pure and Applied Microbiology **13(4)**, 2201-2208 Article 5883.(2019)

10. Mental health disorders in adolescents. Committee Opinion No.705. American College of Obstetricians and Gynecologists. ObstetGynecol 2017;130:e32–41.
11. Miller, Adam & Esposito-Smythers, Christianne&Leichtweis, RichardThe Role of Social Support in Adolescent Suicidal Ideation and Suicide Attempts. Journal of Adolescent Health. (2014)
12. Neena S Sawant, Manoj D More, Screening For Psychosocial Problems in Children Seeking Pediatric Services: An Indian Study Malaysian Journal of Paediatrics and Child Health, Vol. 17 (2): 6-20 (2012)
13. Timimi S. Effect of globalisation on children's mental health. BMJ; 331:37–9, (2005)
14. El Dib R., Periyasamy A.G., de Barros J.L., Franca C.G., Senefonte F.L., Vesentini G., Alves M.G.O., (...), Kapoor A.Probiotics for the treatment of depression and anxiety: A systematic review and meta-analysis of randomized controlled trials, Clinical Nutrition ESPEN, 45 , pp. 75-90. (2021)
15. Franklin, J. C., Ribeiro, J. D., Fox, K. R., Bentley, K. H., Kleiman, E. M., Huang, X., Musacchio, K. M., Jaroszewski, A. C., Chang, B. P., & Nock, M. K. Risk factors for suicidal thoughts and behaviors: A meta-analysis of 50 years of research. Psychological Bulletin, 143(2), 187–232 (2017)

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2. పోతన భాగవతసంభాషణలు: అద్వైతం, తదితర సిద్ధాంతాలు

కొమ్ము మాధవి

తెలుగు పరిశోధకులు, శ్రీ పద్మావతి మహిళా విశ్వవిద్యాలయం, తిరుపతి &
తెలుగు అధ్యాపకులు, అన్నవరం సత్యవతీ దేవి ప్రభుత్వ మహిళా కళాశాల, (స్వయంప్రతిపత్తి),
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సహాయాచార్యులు, తెలుగుశాఖ,
శ్రీపద్మావతి మహిళావిశ్వవిద్యాలయం
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వ్యాససంగ్రహం:

తెలుగువారు చేసుకొన్న కోటిపుణ్యాల ఫలితం పోతన మహాకవి అందించిన భాగవతం. వేదవ్యాసకృతముగా ప్రసిద్ధికెక్కిన భాగవతపురాణమును పోతన క్రీ.శ.15వ శతాబ్దంలో కావ్యముగా స్వేచ్ఛానువాదం చేశాడు. సంస్కృత భాగవతానికి ద్వైతాద్వైతవిశిష్టాద్వైతాది సిద్ధాంతపరములుగా వచ్చిన వ్యాఖ్యానములు ఉన్నాయి. వీటిలో శ్రీధరస్వామి అద్వైతసిద్ధాంతపరముగా వ్రాసిన 'భావార్థ దీపిక'ను పోతన అనుసరించాడని పెక్కుమంది పరిశోధకులు అభిప్రాయపడుతున్నారు. అందువల్ల పోతన భాగవతమునకు అద్వైతవ్యాఖ్యను ఎంతవరకు అనుసరించాడనే అంశాన్ని పరిశీలించటం, ఇతర సిద్ధాంతాలు కూడా ఎక్కడెక్కడ కనిపిస్తాయో సోదాహరణంగా సూచనప్రాయంగా తెలియజేయడం ఈ పరిశోధనావ్యాస ఉద్దేశ్యం. ప్రసిద్ధసంభాషణల్లో ఈ సిద్ధాంతాలు ఎలా ఆనుషంగికంగా మిశ్రితమై ఉన్నాయో ఈ వ్యాసం చర్చిస్తుంది.

Keywords: పోతన, భాగవతం, అద్వైతం, విశిష్టాద్వైతం, ద్వైతం, జైనం, ప్రకృతి ఆరాధన.

1. ఉపోద్ఘాతం:

శ్రీమద్రామాయణభారతభాగవతాలు విశ్వమానవాళికి అందిన కామితార్థదాయినులైన కల్పతరువులు. వేదసమాన ప్రతిపత్తి కలిగిన ఈ పురాణేతిహాసకావ్యాలు మహర్షులయిన వాల్మీకివ్యాస మునీంద్రులు సంస్కృతంలో కూర్చగా ఎన్నో భాషలలో అనువాదములు

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పొంది, ఇంకా పొందుతూ యుగయుగములుగా ధార్మికులచేత సేవింపబడుతూ ఉన్న, భారతభూమి ప్రపంచమునకు ఒసగిన వారసత్వ సంపదలు. క్రీ.శ.15వ శతాబ్దంలో భక్తకవి బమ్మెర పోతనామాత్యుడు తెలుగు వారి కోటిపుణ్యాల ఫలముగా మధురభక్తిభావబంధురముగా భాగవతమును తెనిగించి మరి ఏ ఇతర కావ్యమునూ రచించనవసరము లేకుండా తన పేరును ఆచంద్రార్కం నిలుపుకొన్నాడు.

2. పోతన ఆంధ్రీకరణ:

సంస్కృతములో వేదవ్యాసకృతముగా ప్రసిద్ధి చెందిన భాగవత పురాణమును పోతన సంస్కృతాంధ్ర కవులను సమానముగా మెప్పించునట్లు మూలములో ఉన్న ప్రణాళికకు అనుగుణముగానే 12 స్కంధములలో శ్రీమదాంధ్రమహాభాగవతముగా తెనిగించాడు. వీనిలో పంచమ, షష్ఠమ, ఏకాదశ, ద్వాదశస్కంధములు మాత్రము ఆయన శిష్యులయిన ఏల్చూరి సింగన, బొప్పరాజు గంగయ, వెలిగందల నారయ రచించినట్లుగా ప్రసిద్ధమయ్యాయి.

శృంగి అనే ముని శాపం కారణంగా తక్షకుడు అనే సర్పం వలన ఏడు రోజులలో మరణించే పరీక్షిత్తునకు మోక్షము పొందటానికి సులభమైన మార్గంగా శ్రీశుకమహర్షి తన తండ్రి వ్యాస భగవానుడు తనకు తెలిపిన భాగవతమును వినిపిస్తాడు. భాగవతం శ్రీమన్నారాయణుని లీలావతారాల వర్ణన, ఆయన నామగుణరూపకీర్తనము, విష్ణుభక్తుల కథలు ప్రధానంగా కలిగినది. గజేంద్ర మోక్షణం, ప్రహ్లాద చరిత్ర, ధ్రువోపాఖ్యానం, కుచేలోపాఖ్యానం, రుక్మిణీ కళ్యాణం, అంబరీష చరిత్ర, శ్రీకృష్ణావతారము మొదలైన భక్తి రసబంధురమైన అద్భుత గాథలు చదివేవారి, వినేవారి జన్మములు తరించేలాగా వర్ణింపబడ్డాయి.

భాగవతము అనగా భగవత్సంబంధమైనది అని అర్థం. భాగవతులు అనగా భగవంతునికి సంబంధించినవారు-భక్తులు అని భావం. ఇందులో విష్ణుదేవుని లీలావతారములు, విష్ణుభక్తుల కథలు వర్ణింపబడ్డాయి.

3. సంస్కృత భాగవతవ్యాఖ్యానములు :

సంస్కృత భాగవతమునకు అనేక వ్యాఖ్యానములు ఉన్నాయి. ఒక కావ్యమును చదివిన వారు ఆ కావ్యమును అర్థము చేసుకొని తాము గ్రహించిన భావమునే వ్యాఖ్య అనవచ్చు. ఒక కావ్యమును నేరుగా చదివి అర్థము చేసుకోలేనివారికి వ్యాఖ్యానములు సహాయకారులుగా ఉంటాయి. అంతేకాక, లోతుగా, నిగూఢంగా దాగి ఉండే విశేషార్థములను గ్రహించటానికి కూడా ఈ వ్యాఖ్యలు ఉపకరిస్తాయి. సంస్కృత భాగవతమునకు ద్వైతాద్వైత విశిష్టాద్వైతాది సిద్ధాంతపరములుగా వచ్చిన శుక పక్షేయము, భాగవత చంద్రిక, పదరత్నావళి, సిద్ధాంత ప్రదీపము, ఆధ్యాత్మిక టీక, క్రమ సందర్భము, సారార్థదర్శిని మొదలైన వ్యాఖ్యానములు 30 కి పైగా ఉన్నాయి.

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ఇవి మాత్రమే కాకుండా శ్రీధరస్వామి భాగవతమునకు అద్వైతసిద్ధాంతమును వర్తింపచేస్తూ 'శ్రీధరీయము' అనే నామాంతరము గల 'భావార్థదీపిక' అను వ్యాఖ్యను రచించాడు. పోతన తన ఆంధ్రీకరణములో కథాపరముగా వ్యాసభాగవతమును, వ్యాఖ్యానపరముగా శ్రీధరీయమును అనుసరించాడని పెక్కుమంది పరిశోధకుల అభిప్రాయం. ఇక్కడ ఒక సందేహం రావచ్చు. మూలమును యథాతథముగా అనువదించి చదువుకోవచ్చు కదా! వ్యాస భగవానుడు ఏమి చెప్పాడో అది అర్థం చేసుకోవాలి గాని ద్వైతం, అద్వైతం, విశిష్టాద్వైతం అంటూ వేరు వేరు అర్థములెందుకు? నిజంగా వ్యాసుని అభిప్రాయం ఏమిటి? అని. ఇది కొంతవరకు నిజమే కానీ ఆదిమధ్యాంతరహితుడు, సాకార, నిరాకార స్వరూపుడు అయిన పరమాత్మ తన భక్తులు ఏ రూపముగా ఏ పేరుతో భావించి సేవిస్తారో వారిని ఆ విధముగానే అనుగ్రహిస్తాడు. "యే యథా మాం ప్రపద్యంతే తాం స్తథైవ భజామ్యహమ్" అని శ్రీకృష్ణ పరమాత్మ భగవద్గీతలో చెప్పాడు కదా! అంతేకాక అనంత శక్తి స్వరూపుడైన పరమాత్మను, పరబ్రహ్మమును అందరూ ఒకే విధముగా దర్శించలేరు. ఎవరి అభిరుచి శక్తి, స్థాయిలను అనుసరించి వారు ఆయనను ధ్యానిస్తారు. అందువల్లనే సనాతన ధర్మములో విభిన్న దృష్టికోణములు, ఆరాధనా విధానములు ఏర్పడ్డాయి. అందువలన ఆ భగవత్తత్వమును అర్థము చేసుకొనే క్రమములో, తాము అర్థం చేసుకొన్న రీతిలో భాగవతమునకు కూడా వివిధ సిద్ధాంతాల పరముగా, భిన్న దృష్టి కోణములతో పలు వ్యాఖ్యానములు వచ్చాయి. మరి పోతన భాగవతము ఎక్కువమంది పరిశోధకులు భావించినట్లు సంపూర్ణముగా అద్వైతపరముగానే వ్రాయబడిందా? లేక ఇతర సిద్ధాంతములు కూడా ప్రవర్తిస్తున్నాయా? అనే అంశం పరిశీలించటమే ఈ పరిశోధనా వ్యాస ఉద్దేశ్యం.

4. అద్వైతసిద్ధాంతం – అవగాహన:

అద్వైతసిద్ధాంతప్రవక్త శంకరభగవత్పాదులు. వేదములలో ప్రతిష్ఠింపబడిన అద్వైతమును పునరుద్ధరించినవారు. న+ద్వైతం= అద్వైతం. ద్వైతము కానిది అద్వైతం. ద్వి అనగా రెండు. ద్వైతము అనగా రెండు కలది. అద్వైతం అనగా రెండు లేనిది, ఒక్కటే ఉన్నది అని భావం. ఇందులో రెండు ఏమిటి అంటే, 1. జీవాత్మ 2. పరమాత్మ. జీవాత్మ, పరమాత్మ అని రెండూ పైకి వేరువేరుగా కనిపిస్తున్నా, అవి వేరు కావని, రెండూ ఒక్కటే అని చెప్పేది అద్వైత సిద్ధాంతం. మరి రెండూ ఒక్కటే అయినప్పుడు వేరు వేరు పేర్లతో ఎందుకు వ్యహరిస్తున్నాము? అంటే, నిజానికి జీవాత్మ, పరమాత్మ ఇద్దరూ ఒక్కటే. అంతటా వ్యాపించి ఉన్నది, అంతా తానే అయి ఉన్నది, తాను కాక వేరుగా మరొక పదార్థము ఏదీ లేనిదీ పరబ్రహ్మతత్వము.

సృష్టి చేయాలనే పరమాత్ముని సంకల్పము వలన జనించినది మాయ. బ్రహ్మము శాశ్వతము, సత్యము. మాయాశక్తి వలన అజ్ఞానం ఆవరించి ఒక సత్యమే అనేక విధములుగా కనబడుతోంది. 'బ్రహ్మ సత్యం, జగన్మిథ్యా'. బ్రహ్మమే సత్యము. జగత్తు మిథ్య. ఉన్న బ్రహ్మము లేనిదిగా, లేని జగత్తు ఉన్నట్లుగా కనపడటాన్ని మిథ్య అంటారు. అజ్ఞానం అంతరించినప్పుడు జీవునికి స్వస్వరూప జ్ఞానం కలిగి

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తాను పరబ్రహ్మమనే సత్యాన్ని గ్రహిస్తాడు. అదే అద్వైతస్థితి. ఇది స్థూలంగా అద్వైతతత్త్వం. ఈ సిద్ధాంతం పోతన భాగవతమునకు సంపూర్ణంగా వర్తిస్తుందా? అనే అంశాన్ని పరిశీలిద్దాం.

5. పోతన భాగవతం – అద్వైతతత్త్వం :

పోతన భాగవతంలోని ఆఖ్యానోపాఖ్యానముల ద్వారా, సంభాషణల ద్వారా, వర్ణనల ద్వారా, వ్యాఖ్యల ద్వారా అద్వైతభావనలు వ్యక్తమవుతూ ఉంటాయి. వానిలో కొన్నింటిని ఇప్పుడు పరిశీలిద్దాం.

పోతన ప్రారంభ పద్యంలో-

"శ్రీ కైవల్య పదంబుఁజేరుటకునై చింతించెదన్ లోకర
క్షైకారంభకు భక్త పాలనకళా సరంభకున్ దానవో
ద్రేక స్థంభకు గేళి లోల విలసద్భృగ్జాల సంభూత నా
నా కంజాతభవాండకుంభకు మహానందాంగనా డింభకున్" -భాగ. 1.1.

బాలకృష్ణని కైవల్యపదము కొరకు ప్రార్థించాడు. కైవల్యమంటే మోక్షపదము. జననమరణాలనే చక్రభ్రమణం లేని పునరావృత్తిరహితమైన పరబ్రహ్మ పదమే కైవల్యం. మోక్షం- సాయుజ్యం, సామీప్యం, సారూప్యం, సాలోక్యం అని నాలుగు విధములుగా ఉంటుంది. సాయుజ్యమంటే పరమాత్మలో లీనమైపోవటం. ఇది ఒక్కటే ఉత్కృష్టమైన మోక్షపదము. మిగిలినవన్నీ సాయుజ్యం కంటే ఒక మెట్టు దిగువనే ఉంటాయి. ఈవిధంగా పోతన ప్రారంభంలోనే పరమాత్మతో అభేదమును కోరుకొని భాగవత రచనను ప్రారంభించాడు. ఈ విధంగా భాగవత రచన, శ్రవణ, పఠనముల పరమ ప్రయోజనం అద్వైతమని పోతన అభిప్రాయంగా తెలుస్తుంది.

ఈ ప్రారంభపద్యం ద్వారా మరికొన్ని విశేషాలు తెలుస్తాయి. బ్రహ్మవిష్ణుమహేశ్వరులు త్రిమూర్తులు. వారు క్రమముగా సృష్టి, స్థితి, లయకారకులు. భాగవతంలో మాత్రం మహావిష్ణువే సర్వాంతర్యామి, సర్వేశ్వరుడు. బ్రహ్మ, మహేశ్వరుడు మొదలైన దేవతలను వారి వారి అధికార స్థానములలో నియమించి సృష్ట్యాదిప్రళయపర్యంతం సమస్త కార్యభారములను వహించేవాడు శ్రీ మహావిష్ణువు. ఆ విష్ణువు నిర్వహించే కార్యములను ఈ పద్యంలో వ్యతిరేక క్రమాలంకారంలో ధ్వనింపచేశాడు. ఇది ఈ పద్యంలోని వైశిష్ట్యం. వీనిలో చివరి కార్యం లయం. కైవల్యం అంటే అత్యున్నత మోక్షస్థితి కదా! అంటే ప్రళయకాలంలో విశ్వమంతా విష్ణువులో లీనమైపోయి ఇంకేమీ మిగలని నిరామయ నిరాకార స్థితి. ఇదే లయం. ఇదే కైవల్యం. లయమంటే సృష్టిని నాశనం చేయటమో, లేదా

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విరూపం చేయటమో కాదు. ఒక క్రమ పద్ధతిలో ప్రారంభించిన సృష్టిని అంతే క్రమ పద్ధతిలో సక్రమంగా ముగించటం. ఇది విష్ణువు యొక్క సృష్టి ఉపసంహార క్రియ. దీనిని మొట్టమొదట సూచించాడు.

తర్వాత 'లోకరక్షైకారంభకున్' అనే పదబంధంలో విష్ణువు నిర్వహించే స్థితి కార్యం చెప్పబడింది. లోకములను స్థిరముగా ఎట్టి అవాంతరములు లేకుండా కొనసాగేలా చేయటం స్థితికార్యం. సోమకుడు వేదములను అపహరించినప్పుడు బ్రహ్మదేవుడు సృష్టిని సక్రమంగా నిర్మించే పనిలో తగిన విజ్ఞానం లేక తికమక పడుచుండగా మత్స్యరూపం ధరించి సోమకుని చంపి వేదములను బ్రహ్మకిచ్చి లోకములను అవ్యవస్థ నుండి కాపాడటం వంటి రక్షణ, పాలన కృత్యములను 'లోకరక్షైకారంభకున్' అనే పదబంధంలో సూచించాడు.

తర్వాతి అంశం 'భక్తపాలనకళాసంరంభకత్వం'. భక్తులను పాలించటం అనేది ఒక కళ. ఎందుకంటే, పంచభూతాత్మకమైన శరీరమును ధరించిన ఎవరికైనా కర్మానుభవం తప్పదు. అటువంటి భక్తుల సంచిత, ప్రారబ్ధ కర్మలకు ఎప్పుడెప్పుడు ఎటువంటి ఫలితాలనివ్వాలో అప్పుడప్పుడు అటువంటి ఫలితాలనిస్తూ, ఆశ్రితులను సంరక్షించుకోవటం, వారిని దయతో పాలించటం అనే పనిలో నిరంతరం సన్నద్ధంగా ఉండటం అనే సూచన ఉంది. అందుకే 'భక్తపాలనకళాసరంభకున్' అని పేర్కొన్నాడు.

భక్తపాలనను కళాత్మకంగా, అలా విలాసంగా నిర్వహిస్తూ ఉన్నప్పుడు రాక్షసుల వలన ఆటంకములు ఎదురైతే వారిని నిలువరించటం, అవసరమైతే వారిని సంహరించటం అనే కార్యములను 'దానవోద్రేకస్తంభకుడు' అనే విశేషణంతో పేర్కొన్నాడు. లోకరక్షైకారంభము, భక్త పాలనకళాసరంభము, దానవోద్రేకస్తంభము అనే మూడు కార్యములను నిర్వహించటానికే నారాయణుడు ఏకవింశతి అవతారములను ధరించాడు.

'కేళిలోల విలసద్భృగ్జాల సంభూత నానా కంజాత భవాండ కుంభకున్' అనే సమాసంలో నారాయణుడు విధాతగా సృష్టి చేసిన వైనాన్ని తెలిపాడు. సృష్టి చేయటానికి కారణం విష్ణువు 'కేళిలోలత్వం' – ఆటలాడటంలో కుతూహలం. అందువలన భృగ్జాలముల నుండి-తన చూపుల మాయల నుండి ఒక ఆటగా, లీలగా, విలాసముగా నానా బ్రహ్మాండములను సృష్టించాడు. అద్వైత సిద్ధాంతం దృశ్యమాన జగత్తును వాస్తవముగా ఉన్నట్లుగా భ్రమ పడటం ఆ మాయ వలననే అని ప్రతిపాదిస్తుంది. ఈ విధంగా పోతన అవతారిక మొదటి పద్యంలో శ్రీ మహావిష్ణువు పంచకృత్య పరాయణత్వమును సూచించాడు.

5.1 పోతనభాగవతరచనోద్ఘలం :

పోతన భాగవతరచన ద్వారా పునరావృత్తి రహితమైన మోక్షమును పొందగలనని ముక్తకంఠంగా తెలిపాడు.

"పలికెడిది భాగవతమట!, పలికించెడివాడు రామభద్రుండట! నే
పలికిన భవహర మగునట!, పలికెద వేఱొండు గాథ పలుకగ నేలా! - భాగ.1.18.

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తన చేత భాగవతమును పలికింపచేసినవాడు శ్రీరామచంద్రుడని, భాగవతమును చెప్పి మరి ఏ ఇతర కావ్యమునూ వ్రాయనవసరము లేకుండా భవహరము అనగా తిరిగి పుట్టుక లేకుండా చేసుకుంటానని పోతన తెలిపాడు.

"ఒనరన్ నన్నయ తిక్కనాదు లీ యుర్వీం పురాణావళుల్
తెనుగుం జేయుచు మత్పురాకృత శుభాధిక్యంబు దానెట్టిదో
తెనుగుం జేయరు మున్ను భాగవతమున్ దీనిం దెనింగించి నా
నా జననంబున్ సఫలంబు జేసెద బునర్జన్మంబు లేకుండగన్" - భాగ.1.21.

అని జన్మాంతరములలో చేసిన పుణ్యవిశేషము వలన భాగవతమును తెనిగించే అపూర్వమైన అవకాశం లభించిందని, ఇప్పుడీ భాగవతమును రచించటం ద్వారా పునర్జన్మ లేకుండా ఈ జన్మమును సఫలం చేసుకుంటానని తెలిపాడు. జీవులు పూర్వజన్మ కర్మానుభవాలను వాసనారూపంగా ఉత్తర జన్మలకు తెచ్చుకుంటూ ఉంటారు. ఆవిధంగా జన్మపరంపరలు కలుగుతూ ఉండటం, పరమాత్మను ఆశ్రయించి జన్మరహిత్యాన్ని పొందటం అనే సిద్ధాంతాన్ని అద్వైతం అంగీకరిస్తుంది.

ఈ విధంగా పోతన కృత్యాదిలోని మూడు పద్యాలలో కైవల్యము, భవహరము, పునర్జన్మ లేకుండా జన్మమును సఫలము చేసుకోవటం అనటం ద్వారా పోతన ఆశించినది మోక్షమని తెలుస్తుంది.

5.2. సంభాషణలు :

భాగవతం శుకపరీక్షిత్తుల, సూతశౌనకాది మహర్షుల సంభాషణారూపమైన కృష్ణసంకీర్తనము. శుకబ్రహ్మర్షి పరీక్షిత్తునకు భాగవతమును వర్ణించిన విధానమును సూతుడు శౌనకుడు మొదలైన మహర్షులకు నైమిశారణ్యంలో వివరించాడు.

లోకంలో మానవులకు శాశ్వతానందాన్ని కలిగించేది ఏదో దానిని తెలుపుమని శౌనకాది మహర్షులు సూతుని అడుగగా సూతుడు హరిగుణకీర్తనానురూపమైన భాగవతమును శుకమహర్షి పరీక్షిత్తునకు తెలిపిన పద్ధతిలో వివరిస్తాడు.

"**ఆరూపుండయి చిదాత్మకుండయి పరగు జీవునికిం బరమేశ్వరు మాయాగుణంబులైన మహదాది రూపంబుల చేత నాత్మస్థానంబుగా స్థూల శరీరంబు విరచితంబైన, గగనంబునందు బవనాశ్రిత మేఘసమూహంబును, గాలియందు బార్థివధూళిధూసరత్వంబును నేరీతి నారీతి ద్రష్టయగు నాత్మ యందు దృశ్యత్వంబు బుద్ధిమంతులు గాని వారిచేత నారోపింపంబడు**." అని చెప్పాడు.

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జీవుడు ఆకారము లేనివాడే. మరి రకరకములైన రూపములతో, రకరకములైన పేర్లతో ఎలా విడివిడిగా కనపడుతున్నాడు? అంటే అదే పరమేశ్వరుని మాయాశక్తి. సృష్టి చేయాలనే ఈశ్వరుని సంకల్పం నుండి జనించినది మాయ. మహత్తు, అహంకారం, శబ్దస్పర్శరూపరసగంధములనే పంచ తన్మాత్రలు, ఈ తన్మాత్రల గుణములు కలిగిన ఆకాశవాయ్వగ్నిజలభూములనే పంచ భూతాలు, వాక్పాణిపాదపాయూపస్థలనే పంచ కర్మేంద్రియాలు, శ్రవణత్వచనేత్రజిహ్వానాసికలనే పంచ జ్ఞానేంద్రియాలు, మనస్సు అనేవి మహదాదులు. మహదాదుల వలన సత్వరజస్తమోగుణములతో జీవుడు స్థూల శరీరం కలిగినవానిగా కనపడుతున్నాడు. ఒకే వజ్రము అనేక కాంతి రేఖలను వెదజల్లినట్లు, ఒకే సూర్యుని నుండి అనేక కాంతి కిరణములు ప్రసరించినట్లు, మాయ ఆవరించిన జీవునికి ఒకే బ్రహ్మము అనేక రూపములైన తనలాంటి జీవులుగా కనపడుతున్నాడు. ఆకాశంలోని మేఘంలో పిల్లలు తాము ఊహించిన ఆకారమును చూస్తారు. 'యద్భావం తద్భవతి' అన్నట్లు జీవులు తమను జీవునిగా భావిస్తే తమయందు జీవుని, తమను బ్రహ్మముగా భావిస్తే తమయందు పరబ్రహ్మమును దర్శిస్తారు. అడవి నుండి తప్పిపోయిన సింహపు పిల్ల మానవుల చేతుల్లో పడి శాకాహారియై తనను మనిషిగా భావించుకుంటుంది. అదే మరొక సింహం చేసిన ప్రబోధంతో తెలివి తెచ్చుకొని తన సహజ జ్ఞానమును పొందుతుంది. అలాగే జీవుని అవస్థ కూడా ఉంటుంది. కారణం పరమేశ్వరుని మయాశక్తి వలన కలిగిన ఆవిద్య. అదే అజ్ఞానం. భూమి నుండి పైకి లేచిన ధూళి కణములు గాలితో కూడి బూడిద రంగు కల మేఘముల వలె ఆకాశంలో కనపడుతూ ఉంటుంది కదా. అలాగే, చిత్ స్వరూపుడు అయిన ఆత్మయందు లేని లక్షణములు ఆరోపింపబడుతాయి. ఆవిద్య వలన ఉన్న బ్రహ్మము లేనట్లుగాను, లేని జగత్తు ఉన్నట్లుగాను కనపడుతూ ఉంటుంది. దీనినే శంకరభగవత్పాదులు మిథ్యాజ్ఞానం అన్నారు. ప్రయత్నపూర్వకముగా సాధన చేసి ఆత్మానాత్మవివేకముతో సత్యమును గ్రహించిన జీవుడు బ్రహ్మ స్వరూపమును పొంది, కట్టె లేకుండానే మండే అగ్ని వలె ప్రకాశిస్తాడు. ఇలా జీవుడు స్వస్వరూప జ్ఞానం పొంది బ్రహ్మత్వం సాధించటమే అద్వైతం. దానికి మొదటి మెట్టు భక్తి. ఇది భాగవతం చెప్పే పరమార్థం.

5.2.1 శుక – పరీక్షిత్తుల సంభాషణ:

శుక మహర్షిని పరీక్షిత్తు కొన్ని ప్రశ్నలు అడిగాడు. అవి : 1. సకల భూత సంసర్గ శూన్యమైన ఆత్మకు భూత సంసర్గం ఏవిధంగా కలిగింది? 2. అది నిష్కారణముగానా? లేక కర్మమును బట్టి కలిగిందా? 3. పరంజ్యోతి స్వరూపుడైన విష్ణుమూర్తికి, బ్రహ్మకు భేదము ఏమైనా ఉందా? లేదా? 4. భక్తి వలన ముక్తి ఏవిధంగా కలుగుతుంది? 5. జీవుడు దేహ సంబంధము వలన మాయకు లోబడి ఉంటాడు. మరి భగవంతుడు కూడా శరీరధారి అయినప్పుడు ఆ దేహ సంబంధము వలన వలన మాయకు లోబడి ఉంటాడా? అంటే దేహభ్రాంతి దేవునకు కూడా ఉందా? ఈ ప్రశ్నలకు భాగవతం ద్వారా సందేహ నివృత్తి కలుగుతుంది.

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"జీవుడు సుజ్ఞాన స్వరూపుడు. అటువంటి జీవునికి దేహముతో సంబంధం ఈశ్వరమాయ లేకుండా కలుగదు. శ్రీహరి యొక్క యోగమాయాప్రభావం వలన జీవుడు పాంచభౌతిక శరీరం పొందుతాడు, శరీరం కారణంగా నేను, నాది అన్న అహంకారంతో సంసారమునందు తగులుకొంటాడు. పుటం పెట్టిన మేలిమి బంగారమైనా ధూళి చేత కప్పబడినప్పుడు దాని అసలు రూపం ఎలా మరుగుపడి ఉంటుందో, అలాగే మాయ ఆవరించి ఉన్న జీవుడు తన స్వరూప జ్ఞానమును కోల్పోతాడు. అతనికి భగవద్భక్తి యోగముతో ముక్తి కలుగుతుంది. జీవుడు అవిద్య వలన కర్మల ననుసరించి అసత్యమైన దేహసంబంధం కలవాడవుతున్నాడు. కానీ భగవంతుడు తాను సృజించిన నిజమాయా ప్రభావమునకు లోను కాక తన ఇచ్ఛతో కల్పించుకొన్న లీలా విగ్రహధారియై ఉంది, మాయకు లోనైన వారికి తాను కూడా శరీర సంబంధమైన కర్మలను అనుభవిస్తున్నట్లు భ్రమింపచేస్తాడు. రంగుల కళ్ళద్దములను ధరించిన వారికి లోకమంతా అదే రంగులో కనిపించినట్లు మాయలో నిమగ్నమైన ఉన్న జీవునికి పరమాత్ముడు కూడా మాయకు లోబడి ఉన్నట్లు కనిపిస్తుంది.

ఇందులో ఒక విశేషం ఉంది. జీవులందరూ శరీరాధారులైనందువల్ల ఆ శరీరముతో పాటు వచ్చిన సుఖ దుఃఖములను అనుభవిస్తుంటారు. కేవల భౌతికాపేక్ష కలిగిన జీవులతో పాటు, పరమాత్మను ఆశ్రయించిన జీవులు కూడా సుఖములను అనుభవిస్తుంటారు. అయితే, భగవద్భక్తులు కానివారు ఇహలోకములో సుఖములను అనుభవించిన తర్వాత వారి కర్మానుభవమును బట్టి ఫలితములను, జనన మరణములను పొందుతుంటారు. పరమాత్మను ఆశ్రయించిన జీవులు భగవద్భక్తి చేత కలిగిన జ్ఞానముతో పరమపదమును చేరి ఆనందానుభూతిని శాశ్వతముగా పొందగలుగుతారు. ఇది ఇద్దరికీ భేదము. ఈ బ్రహ్మజ్ఞానమును విదితం చేయటానికే ఆత్మకు ఆధ్యాత్మికము, అధిదైవికము, ఆధిభౌతికము అనే తాపత్రయము కల్పించబడింది. ఈ విధంగా శుక పరీక్షిత్తుల సంభాషణలో అద్వైతం ప్రతిష్ఠింపబడింది.

5.2.2 విదుర - మైత్రేయుల సంభాషణ:

ఇందులో తత్త్వవిచారం ఇమిడి ఉంది. విదురుడు, మైత్రేయుని కాలస్వరూపాన్ని గురించి, శ్రీమన్నారాయణుని విరాట్స్వరూపమును గురించి ప్రశ్నిస్తాడు. అప్పుడు మైత్రేయుడు ఇలా చెప్పాడు :

"తెఱగొప్ప నఖిల విశ్వము
బురుషోత్తము మాయ చేత బుట్టుం బెరుగున్
విరతిం బొందుచు నుండుం
గర మర్థిం భూత భావి కాలము లందున్" - భాగ.3.343.

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"ఈ సృష్టికి పూర్వం వెలుపల మొదలు, తుద లేని ఒక తత్త్వం ఉంది. ఆ తత్త్వమే ఈ సృష్టికి మూలం. ఇరవై నాలుగు గుణాలు, పది ఇంద్రియాలు, పంచభూతాలు పరమాత్మను ఆశ్రయించి ఉంటాయి. ఆయన జగన్నిర్మాణ సమయంలో తగినట్లుగా వాటిని స్వీకరించి, తనను తాను సృష్టించుకున్నాడు. కాబట్టి తాను సృష్టించిన లోకాలన్నింటిలోనూ తానే ఉంటాడు. విశ్వమునకు కారణమూ, కార్యమూ కూడా పరమాత్ముడే. పరమాత్మ యొక్క బాహిర స్వరూపమే ఈ విశ్వము."

"ఈ విధంగా భగవంతుడు చేసే సృష్టి కార్యానికి అంతం అనేది లేదు. అది కొనసాగుతూనే ఉంటుంది. ఈ సృష్టి చేయటానికి ఆయనకు మరొక వస్తువుతో పని లేదు. లౌకిక జగత్తులో ఒక వస్తువును తయారు చేయటానికి మూడు కారణాలు ఉంటాయి. 1. ఉపాదాన కారణము. 2. సమవాయ కారణము. 3. నిమిత్త కారణము. ఒక కుండను రూపొందించటానికి మట్టి కావాలి. అది ఉపాదాన కారణము. కుండగా రూపొందించటం సమవాయ కారణం. కుండను చేసేవాడు నిమిత్త కారణం. కానీ, ఈ జగన్నిర్మాణానికి ఆ కారణాలు అవసరం లేదు. అన్ని కారణాలూ, అన్నీ కార్యాలూ తానే అయి ఉంటాడు". అని చెప్పాడు. విశ్వం అంతా ఒకే పరబ్రహ్మ స్వరూపమని, పరబ్రహ్మము కంటే వేరైన రెండవ వస్తువు ఏది లేదని అద్వైతం తెలుపుతుంది.

నిజానికి "శ్రీకైవల్య పదంబు చేరుటకునై చింతించెదన్" అని పోతన అనటంలోనే మహాభాగవత సారాశమంతా ధ్వనిస్తోంది కాబట్టి భాగవతం మొత్తం అద్వైత తత్త్వ ప్రతిపాదాత్మకమైన కావ్యమని చెప్పటానికి ఇంతకంటే రుజువు వేరే అవసరము లేదని అద్వైతవాదులంటారు. కానీ ఇందులోని ఆఖ్యానములను, వృత్తాంతములను పరిశీలిస్తే, కేవలం అద్వైతం మాత్రమే కాక విశిష్టాద్వైత, ద్వైత, సాంఖ్య, చార్వాక మొదలైన తత్త్వముల ఛాయలు కూడా కనబడుతాయి. ఇప్పుడు అద్వైతంతో పాటు గోచరించే ఇతర సిద్ధాంతములను పరిశీలిద్దాం.

౬. పోతన భాగవతంలో అద్వైతేతర సిద్ధాంతములు:

౬.1 విశిష్టాద్వైతం :

విశిష్టాద్వైతాన్ని భగవద్రామానుజులు ఉపదేశించారు. అద్వైతమైనా కొన్ని భేదాలతో అద్వైతం కంటె కొంత భిన్నంగా ఉంటుంది. పరమాత్మలో జీవాత్మ ఐక్యాన్ని విశిష్టాద్వైతం అంగీకరిస్తుంది. విశిష్టాద్వైతంలో జీవేశ్వరులు ప్రకృతి పురుషులుగా ఉంటారు. ఆచార్యుని ద్వారా జీవాత్మ పరమాత్ముని చేరుతుంది. అద్వైతంలో ఆచార్యుని సహాయం అవసరమే గానీ తప్పనిసరి కాదు. ఇది భేదం.

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విష్ణువు ఒక్కడే పరమాత్మ అని బోధిస్తుంది. ఇతరులను దైవములుగా అంగీకరించదు. విష్ణుపారమ్యమును బోధించుట విశిష్టాద్వైతం చేత విశిష్టాద్వైతమే శ్రీవైష్ణవ మతంగా ప్రసిద్ధి పొందింది.

6.1.1 పరీక్షిత్తు - శుక సంభాషణ:

మోక్షార్థి అయిన పరీక్షిత్తు శుక బ్రహ్మర్షిని-

'ఏమి చింతించిన నేమి జపించిన నేమి గావించిన నేమి వినిన

నేమి సేవించిన నెన్నCడు సంసార పద్ధతిC బాసిన పదవి గలుగు?' - భాగ.1.525.

ఏమి ధ్యానిస్తే, ఏమి జపిస్తే, ఏమి చేస్తే, ఏమి వింటే, ఏమి సేవిస్తే, ఎప్పుడు సంసార బంధముల నుండి విముక్తి కలుగుతుంది? అని పరీక్షిత్తు ఆరు ప్రశ్నలడిగాడు. ఈ ఆరు ప్రశ్నలకు శుకుడు మహావిష్ణువును సమాధానంగా చూపించాడు.

"..... సర్వాత్ముకుడు మహావిభవుడు విష్ణు డీశు డాకర్ణింపన్

సేవింపను వర్ణింపను భావింపను భావ్యు డభవభాజికి నధిపా! - భాగ.2.4.

'మోక్షాపేక్ష గలవానికి సర్వాత్మలలో నెలకొన్నవాడు, గొప్ప వైభవం గలవాడు, సర్వవ్యాపకుడు అయిన విష్ణువే సేవించటానికి, వర్ణించటానికి, భావించటానికి తగినవాడు' అని చెప్పి అందుకు తగినట్లుగా భాగవతం వినిపించాడు.

"హరి మయము విశ్వమంతయు హరి విశ్వమయుండు సంశయము పని లేదా

హరి మయము గాని ద్రవ్యము, పరమాణువు లేదు వంశపావన! వింటే" - భాగ.2.17.

మహావిష్ణువు తప్ప విశ్వములో మరొకటి లేదు అని చెప్పటంలో విశిష్టాద్వైతం వ్యక్తమవుతుంది.

6.2. ద్వైతం :

ద్వైతం అనగా రెండు వేరు వేరుగా ఉన్నవి అని అర్థం. 'ద్వే జతే గతే యస్మిన్ స్తత్ ద్వైతం' అని ద్వైతమునకు నిర్వచనం. దేవుడు వేరు, జీవుడు వేరు అని ప్రతిపాదించేది ద్వైతం. ద్వైత మత స్థాపకులు ఆనంద తీర్థులు అను నామాంతరము గల మధ్వాచార్యులు. మోక్షమంటే జీవాత్మ పరమాత్మకు చేరువ కావటమే. ఆన్ని విషయాలలోనూ పరమాత్మ కంటే చాలా తక్కువ స్థాయిలో ఉండి పరమాత్మను దర్శిస్తూ ఉంటుంది. కానీ జీవాత్మపరమాత్మలు ఒక్కటి కావటం మాత్రం అసంభవం. శ్రీమన్నారాయణుడే సర్వోత్తముడు అనేది ద్వైత మత సిద్ధాంతం.

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6.2.1 పరీక్షిత్తు - శుక సంభాషణ:

"..... యతని సేవింప నగు గాక యన్యసేవ,

గలుగనేరవు కైవల్య గౌరవములు....." - భాగ.2.18.

కేవలము విష్ణువును సేవిస్తే మాత్రమే కైవల్యం కలుగుతుంది గాని ఇతర దేవతలను సేవిస్తే మోక్షం సిద్ధించదు". అని శుకుడు పరీక్షిన్మహారాజుతో చెపుతాడు.

6.2.2 గజేంద్రమోక్షం:

గజేంద్ర మోక్షణములో ఏనుగు మొసలి నోట చిక్కి చాలా సంవత్సరములు పోరాడింది. చివరకు తన బలము చాలదని గ్రహించి పూర్వజన్మలో చేసిన పుణ్య విశేషము చేత పరమాత్ముడు ఒకడు ఉన్నాడని, అతడే తనను రక్షించగలడని తెలుసుకొని ఆ పరమేశ్వరుని శరణు వేడింది. "..... అరక్షిత రక్షకుండైన యీశ్వరుం దాపన్నుం డైన నన్నుం గాచు గాక యని నింగి నిక్కి చూచుచు నిట్టూర్పులు నిగిడించుచు బయలాలకించుచు .....: మొఱ పెట్టుకొంది.

ఇక్కడ గజేంద్రుడు ప్రత్యేకంగా బ్రహ్మ అని, విష్ణువు అని, మహేశ్వరుడు అని ఏ ఒక్క దేవుని పేరును ప్రస్తావించకుండా 'దీనులపాలిటి కలిగినవాడు తనను రక్షించుగాక' అని ప్రార్థించాడు. గజేంద్రమోక్షణంలో ఉన్న వైచిత్రి ఏమంటే, గజేంద్రుని ప్రార్థనలో అంతా అద్వైతం వినిపిస్తుంది.

"ఎవ్వనిచే జనించు, జగమెవ్వని లోపల నుండు లీనమై,

యెవ్వని యందు డిందు బరమేశ్వరుడెవ్వడు, మూల కారణం

బెవ్వ డనాది మధ్య లయుడెవ్వడు సర్వము తాన యైన వా

డెవ్వడు వాని నాత్మభవు నీశ్వరునే శరణంబు వేడెదెన్" - భాగ.8 .73.

విశ్వం పుట్టుక, ఉనికి, తుద అన్నిటికీ కారణమైనవాడు, ఆత్మభవుడు ఒక్కడే. ఇతరము లేని వానిని గజేంద్రుడు ప్రార్థించాడు. కానీ అంతలోనే -

''విశ్వమయత లేమి వినియు నూరక యుండి రంబుజాసనాదు లడ్డపడక

విశ్వమయుడు విభుడు విష్ణుండు జిష్ణుండు భక్తియుతున కడ్డ పడ దలచె" - భాగ.8 .94.

బ్రహ్మాది దేవతలకు విశ్వమంతా నిండి ఉండే శక్తి లేక వారు గజేంద్రుని మొర విని కూడా రక్షించకుండా ఊరకు న్నారు. మహావిష్ణువు విశ్వమయుడు, ప్రభువు కాబట్టి గజేంద్రుని రక్షించటానికి పూనుకొన్నాడని పోతన వర్ణించాడు. ఇక్కడ ఇతర దేవతలకన్న విష్ణువే

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అధికుడని చెప్పబడింది. ఈ సందర్భంలో దేవతలందరికన్న సర్వోత్తముడు మహావిష్ణువు అన్న ద్వైత సిద్ధాంతం నిరూపణ అవుతోంది. విశిష్టాద్వైతం ఇతర దేవతల ఉనికిని ఖండించలేదు. అందరిలోనూ విష్ణ్వాధిక్యముతో పాటు విష్ణ్వద్వైతమును విశిష్టాద్వైతం ప్రకటిస్తుంది. శ్రీహరి చేత రక్షింపబడిన గజరాజు హరి కరస్పర్శ చేత విగతపాపుడై అజ్ఞానం పోయి విష్ణువు రూపు పొంది సారూప్య మోక్షమును పొందాడు. గజేంద్రుడు విష్ణువులో లీనం కాలేదు. విష్ణు రూపుడై విష్ణువు కంటే భిన్నంగా ఉన్నాడు. గజేంద్రమోక్షణంలో అద్వైతంతో పాటు ద్వైత భావం కూడా ప్రకటింపబడింది.

6.3 జైనం :

వైదిక మతములోని కొన్ని ఆచారములను నిరసిస్తూ ఆవిర్భవించినవి బౌద్ధ జైన మతములు. జైన మతములో 24 మంది తీర్థంకరులు ఉంటారు. వారిలో ఋషభదేవుడు అని పిలువబడే వృషభనాథుడు మొదటి తీర్థంకరుడు. భాగవతంలో వృషాభావతారం అంటే ఋషభదేవుడే. జైనపురాణమైన ఆదిపురాణంలో ఋషభదేవుని కథలు వర్ణింపబడ్డాయి. భాగవతంలో పరమాత్ముని ఏకవింశతి అవతారములలో 8 వ అవతారం వృషాభావతారం.

6.3.1 వృషభావతారం:

భాగవతంలోని ద్వితీయ స్కంధంలో "అగ్నీధ్రుండను వానికి "నాభి" యనువాడుదయించె, నతనికి మేరుదేవి యను నామాంతరంబు గల "సుదేవి" యందు హరి వృషభావతారంబు నొంది జడస్వభావంబైన యోగంబు దాల్చి ప్రశాంతాంతఃకరణుండును, బరిముక్తసంగుండునునై పరమ హంసాభిగమ్యం బయిన పదం బిది యని మహర్షులు పలుకుచుండం జరించె" అని వృషభావతారము పేర్కొనబడింది.

6.4. ప్రకృతి ఆరాధన:

వ్రేపల్లెలో తరతరాలుగా సకాలంలో వానలు కురిసి, పాడిపంటలతో గోకులం వర్ధిల్లటం కోసం ఇంద్రయాగం చేయటం ఆచారం. ఇంద్రయాగం చేయాలనే ఆలోచనతో ఉన్న నందుని వద్దకు శ్రీకృష్ణుడు వచ్చి తమకు, తమ గోసంపదకు సకల గ్రాసమును, ఓషధులను ఇచ్చే కల్పతరువు వంటి గోవర్ధన పర్వతాన్ని పూజించుదామని వారిచేత గోవర్ధనగిరి పూజ చేయిస్తాడు. ఇంద్రయాగం వైదికమైన క్రతువు. గోవర్ధనగిరి పూజ వేదాలలో లేని ప్రకృతి ఆరాధనా విధానం. ఈ విధంగా కృష్ణుడే స్వయంగా వేదోక్తమైన కర్మలనుండి వారిని ప్రకృతి ఆరాధన వైపు మళ్లించాడు. దీనికి ఒక కారణాన్ని మనం ఊహించవచ్చు. అదేమంటే, వ్రేపల్లెలోని ప్రజలు నేలను, నమ్ముకున్నవారు.