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Criterion-3: Research, Innovations and Extension

Key Indicator 3.3 Research Publication and Awards

3.3.1 Number of research papers published per teacher in the Journals notified on UGC care list during the last five years

2023

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RESEARCH ARTICLE

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SDS-capped 1-pyrenecarboxaldehyde nanoprobe for selective detection of Cu^{2+} ion from water samples: Spectroscopic approach

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Abstract

Sodium dodecyl sulfate (SDS)-capped 1-pyrenecarboxaldehyde nanoparticles (PyalNPs) were prepared using a reprecipitation method in an aqueous medium and exhibited red-shifted aggregation-induced enhanced emission (AIEE). The dynamic light scattering (DLS) examination showed narrower particle size distribution with an average particle size of 41 nm, whereas −34.5 mV zeta potential value indicate the negative surface charge and good stability of nanoparticles (NPs) in an aqueous medium. The AIEE was seen at $\lambda_{max} = 473$ nm in a fluorescence spectrum of a PyalNP suspension. In the presence of Cu^{2+} ions, the fluorescence of PyalNPs quenches very significantly, even in the presence of other metal ions like Ba^{2+}, Ca^{2+}, Cd^{2+}, Co^{2+}, Al^{3+}, Fe^{2+}, Hg^{2+}, Ni^{2+} and Mg^{2+}. The changes in the fluorescence lifetime of PyalNPs in the presence of Cu^{2+} ions suggested that the type of quenching was dynamic. The fluorescence quenching data for the NPs suspension fitted well into a typical Stern–Volmer relationship in the concentration range 1.0–25 μg/ml of Cu^{2+} ions. The estimated value of the correlation coefficient $R^2 = 0.9877$ was close to 1 and showed the linear relationship between quenching data and Cu^{2+} ion concentration. The limit of detection (LOD) was found to be 0.94 ng/ml and is far below the tolerable intake limit value of 1.3 μg/ml accepted by the World Health Organization for Cu^{2+} ions in drinking water. The fluorescence quenching approach for a SDS-capped Pyal nanosuspension for copper ion quantification is of high specificity and coexisting ions were found to interfere very negligibly. The developed method was successfully applied for the estimation of copper ions in river water samples.

KEYWORDS
AIEE, Cu^{2+} ion sensing, fluorescence quenching, SDS-capped 1-pyrenecarboxaldehyde nanoparticles (PyalNPs), surface adsorption

1 | INTRODUCTION

Water pollution is a major concern in today's world, as water bodies are contaminated due to the disposal of heavy metal ions into them. Most of the heavy metal ions are toxic and impair both human health and the environment [1, 2]. Among the essential heavy metal ions, Cu^{2+} is the third most prevalent transition metal ion in the human body and plays a crucial role in various biological activities. Furthermore, for the metabolism and growth of living organisms, its homeostasis is essential [3–6].

At trace levels, Cu^{2+} is essential for bone formation, connective tissue development, cellular respiration, and fundamental nutrition [7]. It is also part of essential metabolic functions in metalloenzymes and proteins [8]. According to the World Health Organization and United States Environmental Protection Agency, the tolerable intake limit for Cu^{2+} ions in the human body is 1.3 μg/ml [9, 10]. However, high concentrations of copper can result in serious illness due to damage to the liver and kidney [11] and may cause conditions such as Alzheimer's disease [12], Wilson's disease [13], Parkinson's disease [14], prions disease [15] and diabetes [16]. Other health threats, such as Indian childhood cirrhosis and idiopathic copper toxicosis, have been reported due to the overloading of copper in children [17].

The common sources of copper include fertilizers, pesticides and discharges from mining, chemical, paper and pharmaceutical industries [18]. Therefore the development of a sensory system to detect Cu^{2+} metal ions is essential for environmental and biological systems. Various analytical techniques have been used to detect Cu^{2+} ions, including electrochemical methods, atomic emission spectroscopy, inductively coupled mass spectroscopy, chemiluminescence immune assays and surface-enhanced Raman scattering [11, 19–22]. Furthermore, these methods involve sophisticated instrumentation, multiple steps and the use of high-cost chemicals [23].

In contrast, fluorimetric methods have received great consideration due to their high sensitivity and simple operation techniques [24–27]. Fluorescent organic nanoparticles (FONPs), due to their ability to selectively bind to analyte molecules, have gained attention in the last few years [23, 24, 28]. Organic nanoparticles (ONPs) are more photostable and are distinctly better than those of molecular probes. Surface charges created on the NPs using suitable surfactants make them capable of complexing with oppositely charged target species. Sodium dodecyl sulfate (SDS) is known to generate not only negative surface charges on NPs but also stabilize them for longer periods.

A low detection limit, quick preparation, low cost and a wide range of organic molecules gives the edge to FONPs over other analytical methods [29, 30]. Small polynuclear aromatic hydrocarbons and their derivatives have been used as fluorescent material to prepare FONPs [23, 24, 28, 30]. 1-Pyrenecarboxaldehyde (Pyal) with its fluorogenic pyrene unit used in the present study has a strong UV–visible absorption spectra, a strong monomer emission with a high quantum yield and expanded π-electron delocalization [8]. It is also possible to make molecules to aggregate differently to produce aggregation-induced enhanced emission (AIEE) of wavelengths that are different than its excimer emission. FONPs have been prepared using laser ablation [31], emulsification diffusion [32], and reprecipitation methods [31, 33]. Among these, reprecipitation methods have been widely applied to synthesize of FONPs because of their simplicity and low cost, as water is the major solvent required in the process.

Metal ion detection using a fluorescence technique with FONPs as the fluorophore brings some obvious changes in fluorescence emission. The detection target is achieved in three important ways, that is fluorescence quenching, fluorescence enhancement and shift in fluorescence emission. These changes may be associated with the mechanisms like photoinduced charge transfer (PCT), photoinduced electron transfer (PET), Förster resonance energy transfer (FRET), chelation-enhanced fluorescence (CHEF) and chelation-enhanced fluorescence quenching (CHEQ). The sensing mechanism relies on the interaction between metal ions and the sensor binding site, so the sensing mechanism with FONPs is the same as that used for traditional sensors. However, some metal ions that are adsorbed onto the NPs surface bring changes in fluorescence and also nanoaggregates formed by self-assembly provide binding sites on the surface with metal ions. Therefore NPs are more efficient and sensitive towards metal ions compared with traditional water-soluble sensors [34].

Pyrene-based compounds are hydrophobic and known to form dimeric (excimer) species because of the lateral π-orbital overlap between adjacent molecules. It is believed that such molecules aggregate when allowed to nucleate in an aqueous medium. Therefore, fluorescent Pyal was chosen to prepare NPs using a reprecipitation method developed in our laboratory. Further attempts were made to modify and stabilize the surface of the NPs using an anionic SDS surfactant. The red-shifted and intense enhanced emission of the PyalNPs was found to be quenched significantly by Cu^{2+} ions present in its vicinity. This fluorescence quenching phenomenon of PyalNPs was evaluated further to develop a simple analytical method for sensing and detecting Cu^{2+} ions from natural water samples. The proposed sensing method has its own merits in terms of novelty, such as an extremely low detection limit compared with other reported methods; the adopted sensing protocol is simple, quick and reproducible. Furthermore, this is the first attempt to prepare pyrene aldehyde-based NPs and their efficient utilization as nanoprobes for copper metal ion sensing. Additionally, the nanoprobe method was successfully applied for the quantification of Cu^{2+} ions in environmental samples.

2 | EXPERIMENTAL

2.1 | Material

1-Pyrenecarboxaldehyde and all metal salts $CuSO_4$, $BaCl_2$, $Ca(NO_3)_2$, $CdCl_2$, $Al(NO_3)_3$, $CoCl_2.6H_2O$, $HgCl_2$, $MgCl_2.6H_2O$, $NiCl_2.6H_2O$ and $FeSO_4.7H_2O$ were purchased from Sigma Aldrich (India). SDS was purchased from Spectrochem Pvt. Ltd (Mumbai, India). Acetone (99.5%) was purchased from Sisco Research Laboratories Pvt. Ltd (India) and was used after distillation. Throughout the experiment, ultrapure water obtained from a Millipore unit (India) was used to prepare solutions.

2.2 | Synthesis of SDS-capped 1-pyrenecarboxaldehyde nanoparticles

SDS-capped 1-pyrenecarboxaldehyde nanoparticles (PyalNPs) were prepared using a reprecipitation method. This method for the

synthesis of organic NPs is a 'bottom-up' approach in which 1 ml of a 1 mM solution of PyaI in acetone is rapidly injected into a 100 ml solution of SDS of concentration 5 mM, with vigorous stirring for 30 min. During stirring, the acetone evaporates and PyaI molecules precipitate in the aqueous medium, nucleate, grow and aggregate with neighbouring molecules to form NPs. SDS acts as a surface controlling agent that, after the initiation of precipitation, prevents agglomeration and controls the particle size of the NPs. Furthermore, ultrasonication was carried out for ~40 min to stabilize the NPs suspended in the aqueous phase. The resulting colloidal dispersion of PyaINPs was characterized by UV–visible absorption, DLS and FE-SEM techniques.

2.3 | Characterization techniques

The UV–visible absorption spectra were recorded at room temperature using a Specord 210 plus (Analytical Jena) spectrophotometer with a 1.0 cm quartz cell. The zeta potential and particle size distribution of the PyaINP aqueous suspension was studied using a Malvern Zeta Sizer Nano ZS (UK). The fluorescence and excitation spectra of the solutions were recorded using a PC-based spectrofluorometer (Model FP-8300, JASCO, Japan). A digital pH meter (LI-120, ELICO Hyderabad, India) was used for pH measurement. FTIR spectra were recorded using an FTIR spectrometer (Model-4600, JASCO, Japan). The fluorescence lifetimes of the PyaINPs were measured under ambient conditions using a Time-Correlated Single Photon Counting (TCSPC) spectrophotometer (HORIBA, UK) and Data Station v.2.5 software was used to monitor decay curves. The morphology of the NPs was examined using an FE-SEM (JEON-6360 Japan).

3 | RESULTS AND DISCUSSION

3.1 | Particle size and morphology of 1-pyrenecarboxaldehyde NPs

The histogram in Figure 1a shows the particle size distribution in an aqueous suspension of the PyaINPs. The histogram reveals a narrow particle size distribution in the range from 28 to 60 nm and an average particle size diameter of 41 nm. The zeta potential distribution presented in Figure 1b gives the zeta potential −34.5 mV, indicating a negative surface charge on the PyaINPs. The amplitude of the zeta potential is indicative of the stability of the NPs. A zeta potential value less than −25 mV or greater than +25 mV gives NPs a high degree of stability because they tend to resist agglomeration of dispersion [35]. Figure 1c shows the FE-SEM micrograph image obtained from an air-dried film of PyaINPs. A 20-µl suspension was dropped onto a clean glass plate and air-dried at room temperature for 24 h. The FE-SEM image shows the cubic-shaped morphology of the NPs and the estimated value of the average particle size was 197 nm. The larger particle size seen in the FE-SEM micrograph was due to the agglomeration of NPs during the evaporation of water from the PyaINPs [30].

3.2 | Photophysical properties of SDS-capped 1-pyrenecarboxaldehyde NPs

AIEE in the NPs was confirmed by recording the absorption and fluorescence spectra for SDS-capped PyaINPs and a dilute solution of PyaI in acetone. Figure 2 shows the absorption spectra of the dilute solution of PyaI in acetone (Figure 2 spectrum a) and the aqueous suspension of PyaINPs (Figure 2 spectrum b). The absorption spectrum a

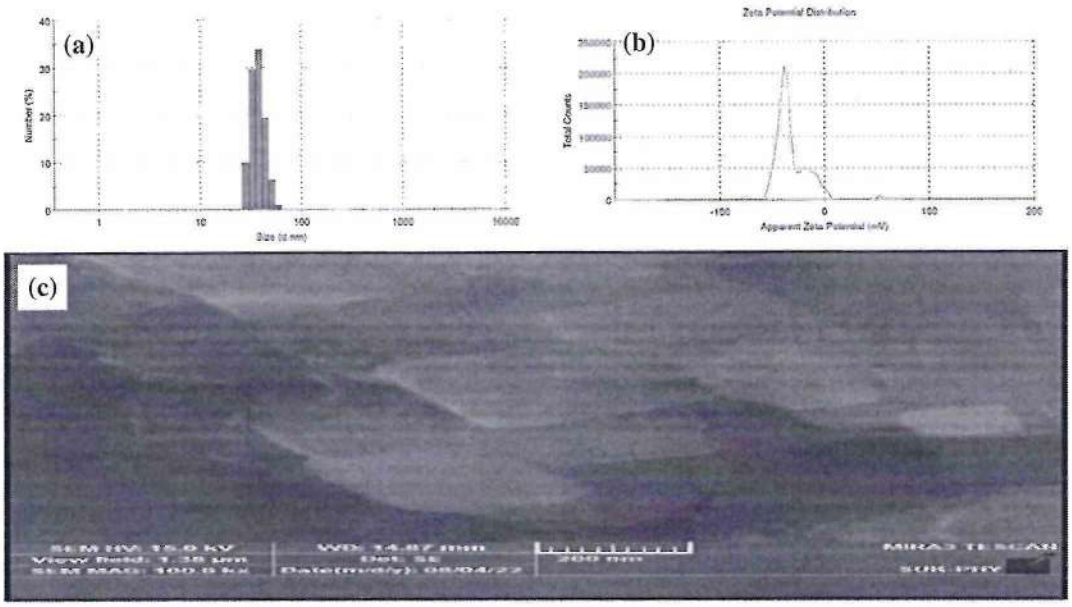


FIGURE 1 (a) Histogram of particle size distribution of PyaINPs, (b) zeta potential of PyaINPs and (c) FE-SEM micrograph of air-dried film of SDS stabilized 1-pyrenecarboxaldehyde nanoparticles (PyaINPs).

was structured and showed peaks in the 320–410 nm region. Some early reports have suggested that anthracene, and pyrene-like condensed polyaromatic hydrocarbon shows different types of excitation directions along the (*a*, *a*′) axis and the (*b*, *b*′) axis. The 320–410 nm region for PyaI in acetone (Figure 2 spectrum a) is associated with the group of bands with low energy originating from excitation along the (*b*, *b*′) axis [36]. The absorption spectrum of PyaINPs is a broad band with a red shift showing an absorption maximum at 401 nm. The bathochromic shift of PyaINPs compared with monomeric PyaI absorption indicated molecular aggregation due to a strong π–π interaction during the formation of NPs [32, 36]. Figure 3 shows the excitation (Figure 3 spectra a and c) and fluorescence (Figure 3 spectra b and d) of a dilute solution of PyaI in acetone and PyaINPs suspended in an aqueous medium, respectively. In contrast with the absorption spectra, the excitation spectrum of PyaI in acetone, seen in the range 315–415 nm, is a broad band peaking at 370 nm. The excitation spectrum 'a' of PyaINPs monitored at its emission wavelength shows two bands with maxima at 370 and 400 nm.

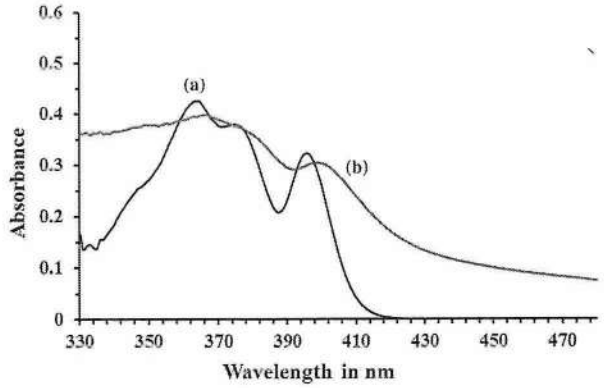


FIGURE 2 (a) (Blue line) absorption spectrum of 1-pyrenecarboxaldehyde in acetone and (b) (red line) absorption spectrum of the PyaINP aqueous suspension.

The bathochromically shifted AIEE in the emission spectrum of PyaINPs (Figure 3 spectrum b) clearly signifies the aggregation of neighbouring static dimers to form NPs through an extended π–π stacking effect. The emission of PyaINPs aqueous suspension (Figure 3 spectrum b) was monitored at $\lambda_{ex} = 370$ nm, and obtained from its excitation spectrum (Figure 3 spectrum a). The emission spectrum was a broad structureless band peaking at 473 nm and seen as red shifted from the emission spectrum of isolated PyaI molecules in acetone (Figure 3 spectrum d). Figure 3 clearly shows that all emission bands of spectrum d of the dilute solution of PyaI in acetone were quenched and that the new intense broad peak appeared due to AIEE.

Stoke's shift, estimated from Figure 3 as the difference between excitation and emission energy of PyaINPs suspension, was $\Delta\bar{\upsilon} = 5886.027\ cm^{-1}$ and that of dilute solution of PyaI in acetone was $\Delta\bar{\upsilon} = 4336.346\ cm^{-1}$. The π-stacking effect of molecular aggregates in nanoclusters led to a large Stoke's shift. The restricted molecular rotation prevented the nonradiative route of the dissipation of energy and therefore favoured the radiative route of enhanced emission intensity [37].

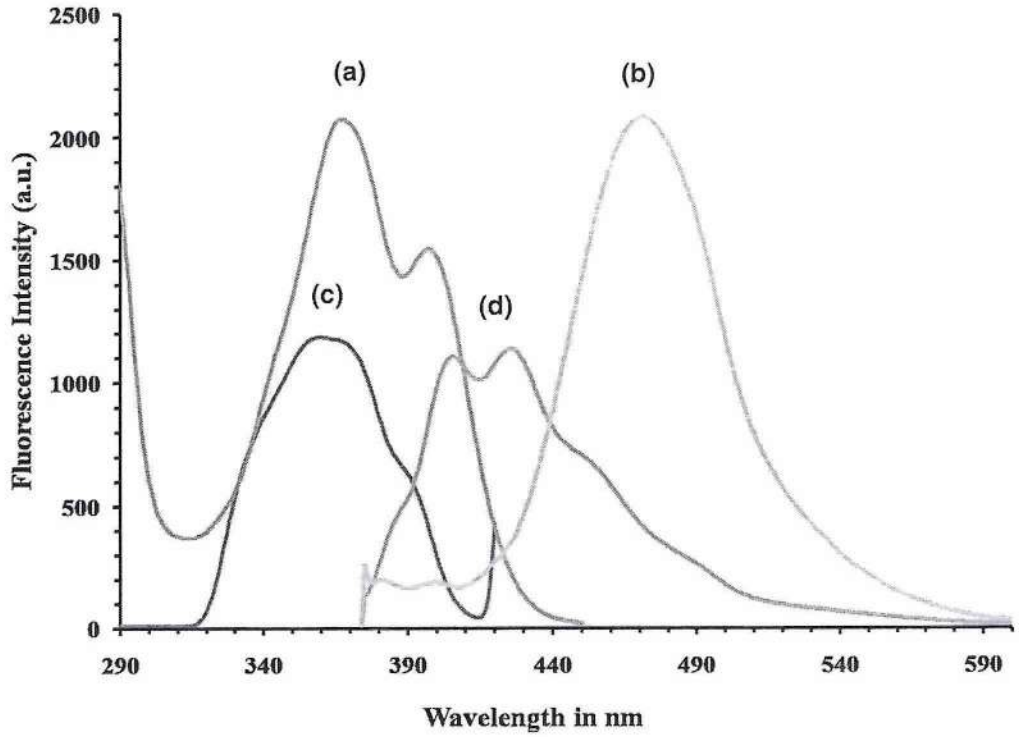


FIGURE 3 Excitation spectrum (a), emission spectrum (b) of PyaINPs suspension and excitation spectra (c), and emission spectra (d) of dilute solution of 1-pyrenecarboxaldehyde in acetone.

3.3 | pH effect

Figure 4 shows the effect of pH on the fluorescence intensity of SDS-capped PyalNPs in aqueous suspension. It shows that emission intensity varied with changes in pH in the rangepH 1–12. The maximum intensity was recorded at pH= 6, whereas higher and lower pH causes decrease in the intensity that may have been due to the disruption of the encapsulated cage of SDS over PyalNPs, causing disaggregation of NPs into monomers [28, 30]. Therefore, in further experiments, all fluorescence measurements were performed by maintaining the pH of suspension equal to 6 by using phosphate buffer.

3.4 | Cation recognition test using an SDS-capped PyalNP suspension

Heavy metal ions, although essential to the human body, are also dangerous after continuous exposure to humans. Therefore, a selective and sensitive approach for the qualitative and quantitative detection of such metal ions is of prime importance for the scientific community worldwide [1, 3, 38]. Metal ions chosen in our study, such as Ba^{2+}, Ca^{2+}, Cd^{2+}, Co^{2+}, Hg^{2+}, Ni^{2+} and Cu^{2+}, are included in the Agency for Toxic Substances and Disease Registry (ATSDR) 2022 substance priority list. This list is based on the combination of frequency and toxicity of substances to humans after exposure. Other metal ions, such as Mg^{2+}, Al^{3+} and Fe^{2+} are among the top 10 elements in the Earth's crust as measured by their abundance. Even though these metals are essential metals, after certain limits, they can be harmful to human beings. Therefore, developing sensory systems to selectively detect any of these metal ions from the chosen set of ions was the purpose behind the selection of these ions.

The zeta potential value (−34.5 mV) of the PyalNP suspension obtained from the zeta potential measurement suggested the possibility of binding NPs with positively charged cations. The different metal ions, namely Cu^{2+}, Ba^{2+}, Ca^{2+}, Cd^{2+}, Co^{2+}, Al^{3+}, Fe^{2+}, Hg^{2+}, Ni^{2+}, Mg^{2+}, with concentrations of 25 μg/ml each, were added to the PyalNP suspension and the fluorescence spectra recorded by monitoring excitation at 370 nm, as shown in Figure 5a. Observation of emission spectra revealed that the fluorescence intensity of the suspension at 473 nm was reduced significantly by the presence of Cu^{2+} ions, whereas other metal ions showed little change.

The presence of Ba^{2+}, Co^{2+}, and Hg^{2+} was seen to decrease the fluorescence very slightly, while the remaining Ca^{2+}, Cd^{2+}, Fe^{2+} and Ni^{2+} actually increases the fluorescence to a small extent. Furthermore, to examine the selectivity of the nanosuspension of PyalNPs for Cu^{2+} ions, the fluorescence intensity was measured in the presence of common interfering ions under a chosen set of conditions in the presence of Cu^{2+} ion alone, and in the presence of Cu^{2+} ions and other interfering metal ions with concentrations 10-fold higher than that of the Cu^{2+} ion. The amount of FL change (ΔF/F) was calculated and is presented as a bar diagram in Figure 5b. The value $\Delta F = F_0 - F$, where F_0 is the FL intensity of PyalNPs without metal ions and F is the FL intensity of PyalNPs in the presence of Cu^{2+} and other interfering metal ions. The red bar expresses the change in fluorescence intensity with Cu^{2+} ions and other interfering ions. Furthermore, the blue bar in Figure 5b indicated quenching of the FL intensity of PyalNPs produced by Cu^{2+} ions together with various coexisting ions. The equal height of the red bar obtained for Cu^{2+} ions and blue bars led us to conclude that the presence of interfering ions at a 10-fold higher concentration had a negligible effect on the fluorescence quenching ability of Cu^{2+} ions.

3.5 | Fluorimetric titration of a PyalNP aqueous suspension versus a Cu^{2+} ion solution

For the quantitative detection of Cu^{2+} ions, the fluorimetric titration experiment was performed. The incremental amounts of Cu^{2+} ion solution were added in the range 1–25 μg/ml into a fixed volume of

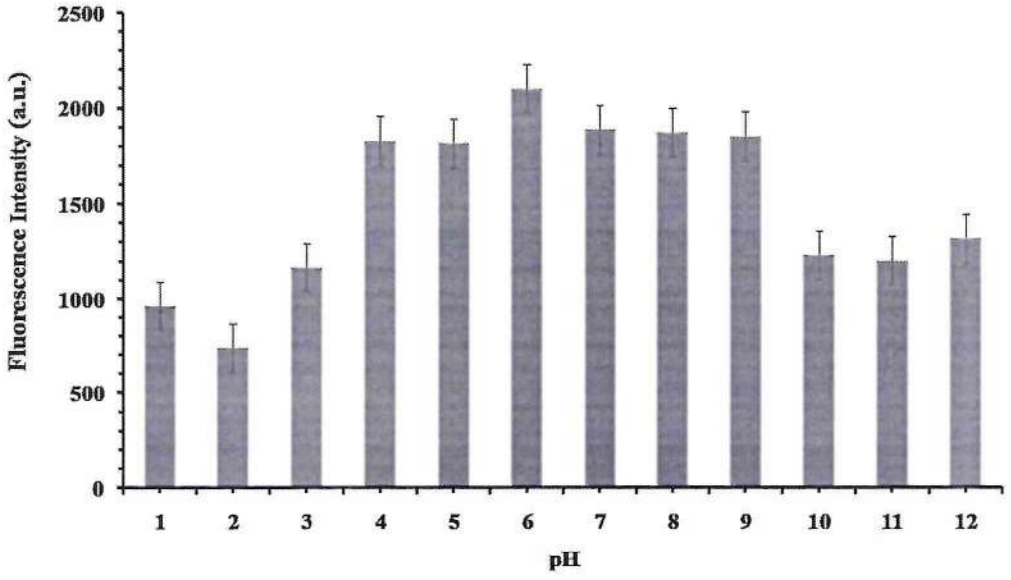


FIGURE 4 Effect of pH on fluorescence intensity (λ_{em} = 473 nm) of 1-pyrenecarboxaldehyde nanoparticle suspension (λ_{ex} = 370 nm).

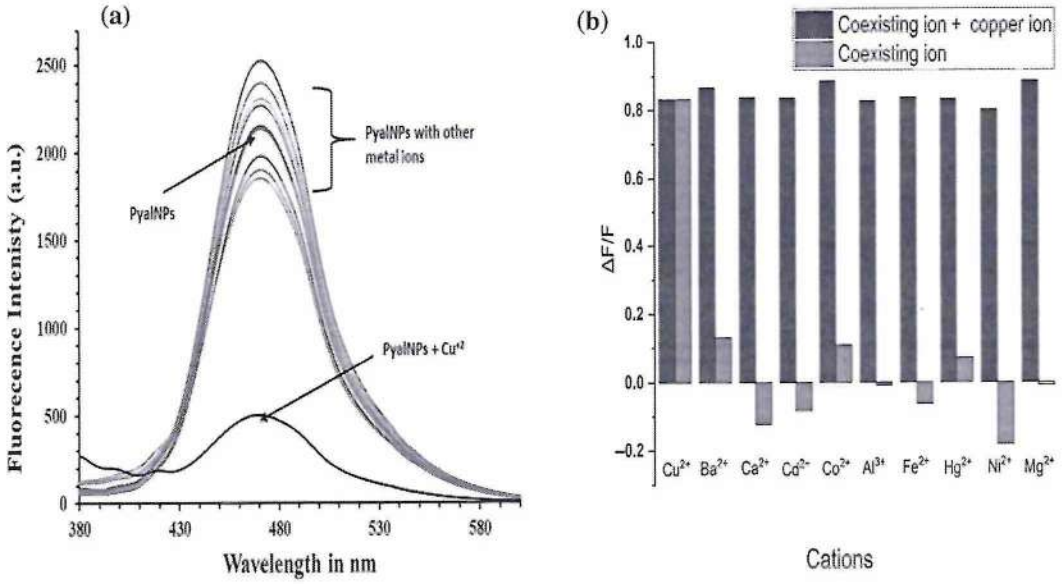


FIGURE 5 (a) Selectivity of PyalNPs towards Cu^{2+} ion in presence of other ions (Ba^{2+}, Ca^{2+}, Cd^{2+}, Co^{2+}, Al^{3+}, Fe^{2+}, Hg^{2+}, Ni^{2+}, and Mg^{2+}) at concentration of 25 μg/ml. (b) Bar diagram showing the change in the fluorescence intensity (ΔF/F) of SDS-capped PyalNPs in the presence or absence of Cu^{2+} ion (25 μg/ml) and coexisting cations (250 μg/ml at λ_{ex} = 370 nm).

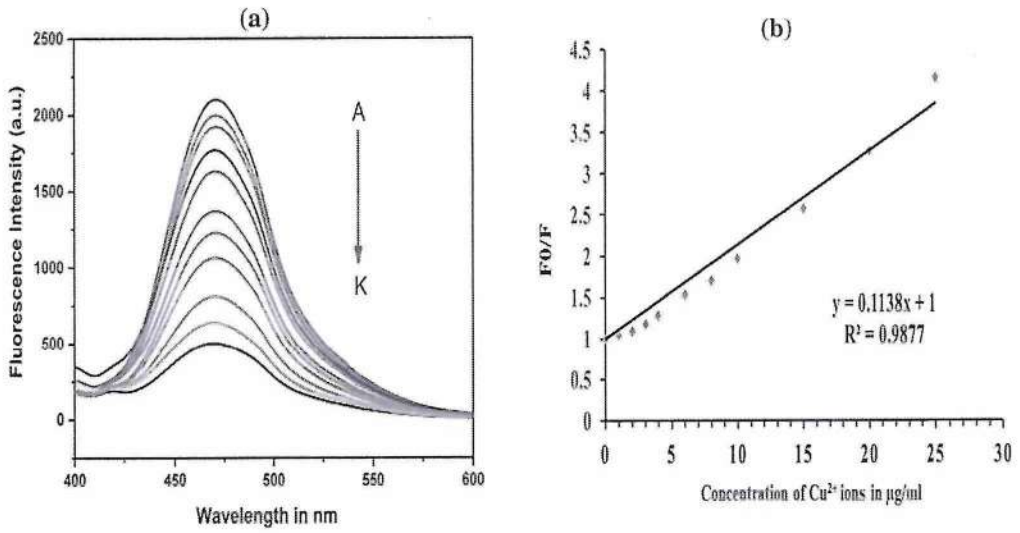


FIGURE 6 (a) Fluorescence spectra of PyalNPs in the presence of different concentrations of Cu^{2+} ion (A: 0 to K: 25 μg/ml). (b) Stern–Volmer plot F_0/F vs different concentration of Cu^{2+} ion solution added.

PyalNP suspension and pH= 6 of the content was maintained using phosphate buffer. The fluorescence spectra of PyalNPs measured at the excitation wavelength 370 nm are displayed in Figure 6a. The addition of Cu^{2+} ion in the range of 1–25 μg/ml turns into a gradual decrease in fluorescence intensity of PyalNPs without any spectral shift. The observed fluorescence quenching effect is modelled using the Stern–Volmer equation as given below:

$$\frac{F_0}{F} = 1 + K_{sv}[Q] \quad (1)$$

where F_0 represents the fluorescence intensity of PyalNPs in the absence of Cu^{2+} ions and F is the FL intensity of PyalNPs in the presence of Cu^{2+} ion. [Q] is the concentration of the quencher and *Ksv* is the Stern–Volmer quenching constant. The plot of F_0/F versus the concentration of Cu^{2+} ions shown in Figure 6b indicates the validity of the Stern–Volmer equation. The experimental data obtained for Cu^{2+} ions fit into the following regression in Equation (2).

$$y = 0.1138x + 1 \quad (2)$$

A linear relationship was found to be developed between F_0/F of fluorescence intensity of PyalNPs with and without Cu^{2+} ions. The correlation coefficient (R^2) value obtained was 0.9877, which is near to 1, suggesting that the two variables of the Stern–Volmer equation had a linear relationship. Furthermore, to examine the fitness of the Stern–Volmer plot for analysis of Cu^{2+} ion from real samples, the limit of detection (LOD) was calculated using Equation (3):

$$LOD = 3.3\sigma/K_{SV} \quad (3)$$

where σ is the standard deviation of the *y*-intercept of the regression lines and *K* is the slope of the calibration graph. The calculated LOD value of 0.94 ng/ml implied that the used fluorescence method was more selective and sensitive. The advantages of this method over other existing methods are illustrated in Table 1.

3.6 | Fluorescence quenching mechanism

The fluorescence quenching mechanism consisted of two main routes, either by static quenching or dynamic quenching, which can be differentiated by careful observations of absorption spectra and the lifetime of the fluorophore. Static quenching produced changes in the absorption spectra of the fluorophore, while the lifetime of the fluorophore remained unchanged. In contrast, dynamic quenching induced changes in the lifetime of the fluorophore in the presence of the quencher, while the absorption spectrum remained unaffected [47]. Therefore, to confirm the mechanism of fluorescence quenching, the fluorescence lifetime of PyalNPs was measured in the presence of 10, 15 and 20 µg/ml of Cu^{2+} ion solutions. Figure 7 shows the decay profiles of PyalNPs with their fluorescence lifetime. The fluorescence lifetime of PyalNPs was 3.24 ns and measured to be decreased to 1.471, 1.113 ns, and 874.73 ps when the Cu^{2+} ion solution concentrations were 10, 15 and 20 µg/ml, respectively.

These results were ascribed to the dynamic fluorescence quenching of PyalNPs by Cu^{2+} ions. Therefore, the plausible mechanism for fluorescence quenching is given based on the complexation between Cu^{2+} ions and SDS-capped PyalNPs. The negative zeta potential value suggested that the NPs surface was negatively charged, and stabilized by the anionic surfactant SDS. The Cu^{2+} ions with d^9 electron configurations favours to possess more positive character because of more electronegativity. Cu^{2+} ions bind electrostatically to PyalNPs forming nonfluorescent complexes [24]. This complexation may decrease the number of fluorophore molecules for PyalNPs. After the absorption of energy by the nonfluorescent complex, it immediately returns to the ground state without photon emission and the probe molecule fails to emit fluorescence [28]. In addition to this, Cu^{2+} is intrinsically paramagnetic in nature and its one electron containing the dx^2-y^2 orbital energy lies between the highest occupied molecular orbital (HOMO) and the lowest unoccupied molecular orbital (LUMO) of the excited fluorophore. Therefore, energy or electron transfer takes place from the excited fluorophore to Cu^{2+} and could be the reason for nonradiative decay (quenching) [48].

Furthermore, to understand the binding interaction of SDS-capped NPs with Cu^{2+} metal ions, an FTIR analysis was performed with or without specific quantities of Cu^{2+} ions. Figure S1 shows the FTIR spectra of SDS-capped NPs without Cu^{2+} ions (Figure S1a) and with 15 and 25 µg/ml Cu^{2+} ions (Figure S1b,c, respectively). Figure S1a shows a significant shift in carbonyl stretching frequency of about 1592 cm^{-1} for Pyal due to capping with SDS over the surface of the NPs during its formation. Furthermore, SDS contains sulfate groups, which show a strong infrared (IR) stretching band at 1215 cm^{-1}, which is clearly seen in Figure S1a. After the addition of 15 and 25 µg/ml Cu^{2+} ions (Figure S1b,c), it seems that the sulfate IR stretching band noticeably disappeared because of the interaction of the sulfate group with Cu^{2+} ions, whereas the IR band for carbonyl

TABLE 1 LOD for Cu^{2+} ions using a probe as per the literature and our present method.

Detection method	LOD (ng ml^{-1})	Reference
Rhodamine-based probes	4.7	[10]
Curcumin nanoparticles probe	1.4	[23]
BINOL-based fluorescent sensor	1.5	[39]
Coumarin thiazolyl-functionalized Schiff base	1.5	[40]
Rhodamine 6G derivatives as probe	37.6	[41]
4-Phenylsemicarbazone 1,2-naphthoquinone-4-sulfonic acid probe	12	[42]
Schiff base derivative	180	[43]
Fluorescein-based probe	6.3	[44]
Red beet pigment method as indicator	54	[45]
Cellulose Schiff base	105	[46]
Our proposed method	0.94	Our method

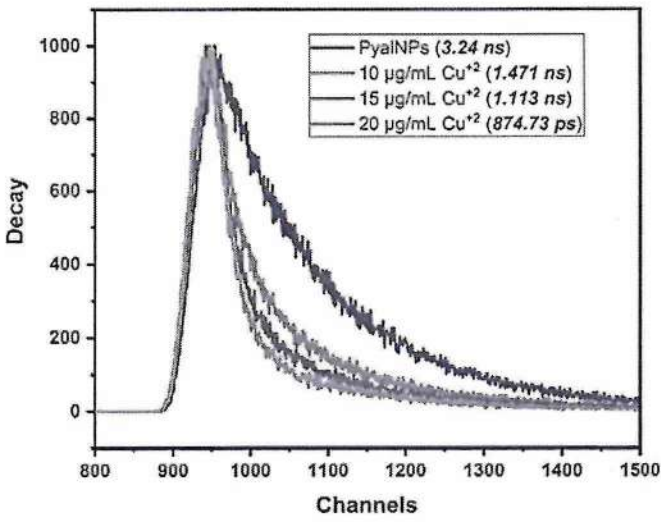
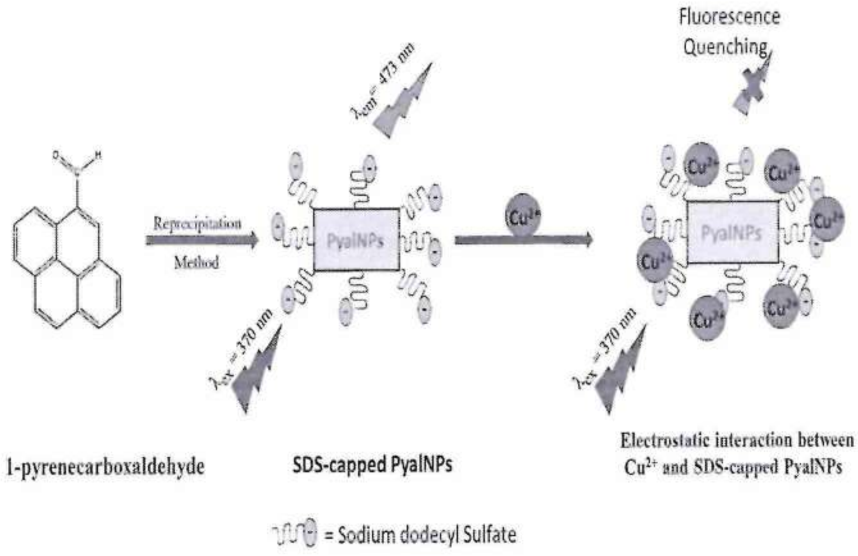


FIGURE 7 Fluorescence lifetimes of PyalNPs with different concentration of Cu^{2+} ion solution viz. 10, 15, and 20 µg/ml.



SCHEME 1 Plausible fluorescence quenching mechanism based on the electrostatic interaction between Cu^{2+} and SDS-capped PyalNPs.

TABLE 2 Cu^{2+} ion determination from water samples using the standard addition method ($n = 3$).

Source of water sample	Synthetic sample of Cu^{2+} ion added in µg/ml	Amount found in µg/ml	% RSD	% Recovery	Relative error
Panchganga River water (Kolhapur, Maharashtra, India)	10	09.88	0.241	98.80	−0.012
	15	14.78	0.452	98.53	−0.014
	20	19.70	0.542	98.50	−0.015

group of aldehyde shifted towards 1683 cm^{-1}. These results support the interactions of Cu^{2+} with SDS-capped PyalNPs. Zeta potential and the particle size of PyalNPs noted from Figure S2 are −34.5 mV and 41 nm that, after the addition of 25 µg/ml of Cu^{2+} ion, were −22.7 mV and 129 nm, respectively. The observed decrease in zeta potential value and the significant increase in particle size hints that positively charged Cu^{2+} adsorbed on the negatively charged surface of PyalNPs. The plausible fluorescence quenching mechanism based on electrostatic interaction between Cu^{2+} and SDS-capped PyalNPs is shown in Scheme 1.

3.7 | Application of the proposed quenching method for quantitative detection of Cu^{2+} ion in real water samples

Our proposed method of fluorescence quenching of PyalNPs in the presence of Cu^{2+} ions was further applied to environmental water samples using a standard addition method. The water sample was collected from Panchganga River, Kolhapur, Maharashtra. The collected water sample was filtered through a Whatman filter paper no. 41 to remove suspended impurities. It was then boiled for 10 min to remove dissolved gases. The water sample was further spiked with different concentrations of standard Cu^{2+} ions. The prepared synthetic samples were further diluted in a working range and used for fluorimetric analysis. The results obtained are shown in Table 2. The relative error and percentage recovery values of Cu^{2+} ions indicated that PyalNPs can be used as fluorescent probes for the selective and sensitive determination of Cu^{2+} ions from environmental samples.

4 | CONCLUSION

Highly fluorescent NPs of 1-pyrenecarboxaldehyde (PyalNPs) were synthesized using a simple reprecipitation method in an SDS solution. The histogram study using the DLS technique showed a narrow particle size distribution and the average size of the particles was 41 nm. FE-SEM micrographs showed the uniformly distributed cubic-shaped morphology of the NPs. The −34.5 mV zeta potential value suggested that the SDS not only generated negative charges on the surface but also stabilize the suspension. The UV–visible absorption, FTIR and fluorescence results were used to study the binding interaction between 1-pyrenecarboxaldehyde NPs and Cu^{2+} ions in an aqueous medium. The experimental result suggested that the intensity of AIEE of the nanosuspension was quenched using a Cu^{2+} ion solution through a dynamic quenching mechanism due to the complexation by electrostatic interactions. The surface-modified PyalNPs selectively recognize Cu^{2+} ions from an aqueous medium in the presence of other coexisting metal ions. The conventional Stern–Volmer relationship showed a good linear relationship for the concentration range 0–25 µg/ml of the Cu^{2+} ions solution. The proposed method was superior to traditional methods in view of its accuracy, simplicity and extremely low detection of limit (0.94 ng/ml) for Cu^{2+}. The proposed method was successfully applied for the determination of Cu^{2+} ions

at trace levels from river water samples collected from local water bodies.

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DATA AVAILABILITY STATEMENT

The data that supports the findings of this study are available in the supplementary material of this article.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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TOWARDS PROSPERITY THROUGH MODERN MICRO IRRIGATION TECHNOLOGY

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***Abstract*- Micro irrigation technology has occupied a predominant place in recent policy discourse on addressing water management issues in India. Irrigation is the process through which controlled amount of water can be supplied through artificial means such as pipes, ditches, sprinklers etc. The main objective of irrigation systems is to help agricultural crop growth, landscape maintenance and reduce the effect of inadequate rainfall Therefore, the importance of irrigation systems is very high. However, many farmers are finding it hard to choose an irrigation system that can best serve them in this article we are going to cover two of the most popular irrigation systems that save both water in their own way and are highly efficient. The paper has analyzed potential, adoption pattern, impact and institutional arrangements for disseminating micro irrigation technology in the country. micro irrigation technology as a tool to improve water use efficiency and farmers' welfare has occupied a prominent place in policy discourse in India.**

***Key words*: Micro Irrigation Scheme in India, Architecture of PMKSY, Evidences from Previous Studies, Benefits of micro irrigation, Evidences from Previous Studies.**

Introduction

Water is fundamental for sustaining a quality life, as well as economic and social development of human society. The Earth's hydrosphere contains a huge amount of water, but 97.5% of total water is saline and remaining 2.5% is fresh water. Out of total available fresh water, 68.7% is in the form of ice and permanent snow cover in polar and high mountainous regions and 29.9% is present as groundwater. The rest 0.3% is available in lakes, rivers and 0.9% in soil moisture, swamp water and permafrost atmosphere (GoI, 2015). India is blessed with vast network of 20 river basins with utilizable water resources of 1123 billion cubic meter (BCM) including both surface and groundwater. There is a large spatial and seasonal variation in the endowment of water resources (Srivastava et al., 2012). With the rising population, the per capita availability of water in India has declined from 5178 m3 /year in 1951 to 1441 m3 /year in 2015, which is lower than the water-stressed norm of 1700 m3 /year. About 60% of Indian population have per capita water availability close to or lower than the water scarcity threshold of 1000 m3 /year. By the year 2050, India's population is projected to reach 1.64 billion and consequently, the per capita water availability will further decline to 1139 m3 /year. On the demand side, the gross water requirement for all users in India was 813 BCM in 2010 and is expected to grow up to 1447 BCM in 2050 (CWC, 2010). Due to rising inter-sectoral competition, the share of agriculture in total water use is expected to decline to 74% in 2050 from its present level of 85% (GoI, 2015). These estimates clearly suggest that agriculture has to produce more food from less water to feed the burgeoning population with changing food habits. This implies the need for adoption of efficient irrigation methods to make agriculture sustainable in the long-run. In India, agriculture is the predominant user of water resources. Irrigation has played a catalytic role in agricultural growth and development of the country due to its positive, direct and indirect impacts. With the massive financial investment by the governments and the farmers, net irrigated area in the country increased from 20.85 million 2 hectare (Mha) in 1950-51 to 68.38 Mha in 2014-15 (DES, 2019). Although India is a world leader in irrigation infrastructure, still half of the total cropped area (51%) remains rainfed and depends on monsoon rainfall. Further, many studies have flagged sustainability and equity concerns in irrigation development in the country (Selvarajan and Roy, 2004; Narayanamoorthy, 2011; Srivastava et al., 2014). It has been observed that positive impact of irrigation development could not be achieved equally across different geographical regions, and unsustainable water resource development in north-western region co-exists with its under-utilization in eastern region of the country (Srivastava et al., 2014). A structural shift in the sources for irrigation has also been observed during the course of irrigation development. While the area under both surface and groundwater sources has increased, the share of surface water sources has declined from 41% in 1970-71 to 23% in 2015-16. On the other hand, the share of groundwater in net irrigated area increased from 38% to 62% during the same period. The over-dependence on groundwater sources has raised several sustainability issues and its socio-economic and ecological manifestations in many pockets of the

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Language as a mean of oppression of women in Sonia Sanchez's Uh, Huh; But How Do It Free Us?

Dr. Sujata Pandurang Solage **Dr. Prabhanjan Mane**

Abstract:

The paper strives to reflect on how language is used as a powerful tool to humiliate and exploit women by both black as well as white men in Sonia Sanchez's *Uh, Uh; But How Do It Free Us?* The English language is in bed with racism. Everyday language reminds African Americans in matter-of-fact ways that our color is related to coercion (blackmail), disgrace (black mark), refusal (blackball), deportation (blacklist), impurity (not the driven snow), illicitness (black market), and death. Words can injure, even if the wound is not immediately evident.

Introduction:

Sonia Sanchez (1934-) is an African American poet, playwright and professor often associated with the Black Arts movement. She has authored a dozen of books of poetry, as well as plays and children's books. She advocated the introduction of black studies courses in California. She has created and taught a course based on Black Women and Literature in the United States and became the first to do this. She played an important role in the Civil Rights Movement and Black Arts Movement. She described the struggles and lives of Black America in many of her plays and books. After teaching twenty years Sanchez retired from Temple University in 2000. *Uh, Uh; But How Do It Free Us?* was written in 1970. Four years later it was published for the first time in an anthology, edited by Ed Bullins, entitled The New Lafayette Theater presents plays with Aesthetic Comments by six black playwrights.

Assessment of Language as a mean of oppression of women in Sonia Sanchez's *Uh, Huh; But How Do It Free Us?*

Language or discourse had been the property of the hegemonic power in the past. The Marginal people were not allowed to voice out as they were the underdogs of the Centre. Women are marginalized and black women are double marginalized for being women and black. In the present drama both black and white women are victimized and tortured by using discourse. Being marginalized they have no power to play with words. But the black women writers like Sonia Sanchez has broken this rule. She offers power to her women and especially black women characters to express themselves in this hegemonic, patriarchal and racial societies. Her women characters are not just victims but they are also revolutionaries. These characters are awaken themselves and are aware about their suffocation and oppression. They find out that it is their voice that can actually make them free from all their clutches. This research paper attempts to analyze how language acts as a tool to oppress women and especially the black women with reference to Sonia Sanchez's *Uh, Uh; But How Do It Free Us?* Sanchez explores how the use of language not only degraded or minimized the black women's importance as human beings but also undermined how their value as contributors to American society and cultural discourse was measured as a whole.

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The characters in this group are some of the ugliest and most absurdly presented figures that Sanchez has created in all of her dramatic work. Much like the mindset cultivated during slavery, women were seen as basic, infantile creatures with questionable values and standards. Four black male characters and a white male converse with two whores' black and white in a series of violent confrontation. These men use language as a tool to humiliate and exploit the women in this group. All men are riding the horses. The women who are victims in this group are prostitutes. He calls her as "an anemic-looking witch". Brother Man informs that he was so awful that they had to pull off her. These men inject cocaine and order the whores to satisfy their physical and emotional whims. These men are using utmost filthy language to abuse, humiliate, discourage and exploit the women in the play.

From the above words of White Man, we can surmise that he puts women at the subsidiary position for being physically weak and delicate. He wants to feel good, warm, secure manly. He wants to enjoy Sado-masochistic sexual pleasure with Black Whore so asks her, "Hit me, hurt me. Turn me inside out with pain". (67) Though he is praising Black Whore, he regards her as a hot blooded lady. The Whore figures' oppression occurs in a culture that privileges the position of men, no matter how deprived their exercise of power may be, whether drug peddling, verbal abuses, buying sex, or physical violence. It reflects when Brother Man asks Black Whore, what is her name? Black Whore's answer to this question is worthy of attention. It shows her anguish to live a life of a normal woman.

> Black Whore: Ain't got no name. Lost my name when I was eleven years old. I became just a body so I forgot my name. Don't nobody want to know a Black woman's name anyway. You gon' take me home with yo to keep? Put me in your pocket to hold/touch when you need some warmth? No? Well, since you ain't, then there ain't no reason to tell ya my name. All ya need to know is on my face on body. If you can read a map you can read me. (68-69)

Sanchez's women characters are revolutionary. Despite of humiliation, dominance, abuses and discouragement, these women dare to open their heart before these so-called black militant men. Sanchez attributes power of discourse to her women. Her prime motive is to encourage black women to revolt against the injustice and violence against them. Here she conveys that woman becomes prostitute not by will but by situation. Sanchez offers Black Whore as her alter ego to share her own opinions about the black men and the subjection of women and race relations as a whole. Black Whore states here that she lost her name when she becomes a prostitute, which makes her just a body. Even she puts forth the negative attitude of the society towards the black woman because, according to her nobody wants to know the name of a black woman. Nobody takes her responsibility. Nobody wants to take her to his home to live with her his whole life. She also says that he will understand her only through her face and body. Just as a map helps to understand the region, her face will help him to know her. Her face and body will reflect the pain of black woman for being marginalized by both her own society and the society of whites, the pain of sexual and racial violence, the pain of humiliation and exploitation, the pain of depriving family life and the pain of living a degradable life. The inner feelings of Black Whore represent the feelings and pain of all black women. It conveys the message that black women have no identity. Their identity is just a woman to

saying that she has to take two or not anyone. The dream is symbolic. She does not want white people to rule over the black woman like her, but the system forces her to accept it. The play ends with Brother's decision to play with both White Woman and Sister.

Conclusion :

In this play all the men both white and black use language as a strong weapon to victimize women. But one positive thing about the women in this play is that the playwright offers right to speak to these women. Waleesha, Black Whore and Sister dare to express their feelings and expectation from the men which are the real feelings and expectation of Sanchez. They are the mouthpiece of Sanchez. They expose the real nature of the black men and how they are responsible for the degradation of their own community. In giving a voice to women within the play Sanchez asserts their right to speak; but in that discourse, they often uphold the negative views of themselves. The larger concern of Sanchez was not only that of how to articulate the life of the black man, but how to make space and welcome the voice of the black woman. May there one day be a universal language of liberation so that all oppressed peoples might resist the dominant power that encourages them to internalize and blame themselves for their own oppression by accepting as normal and inevitable the discourse of the tyrants and its frequently oppressive terminology.

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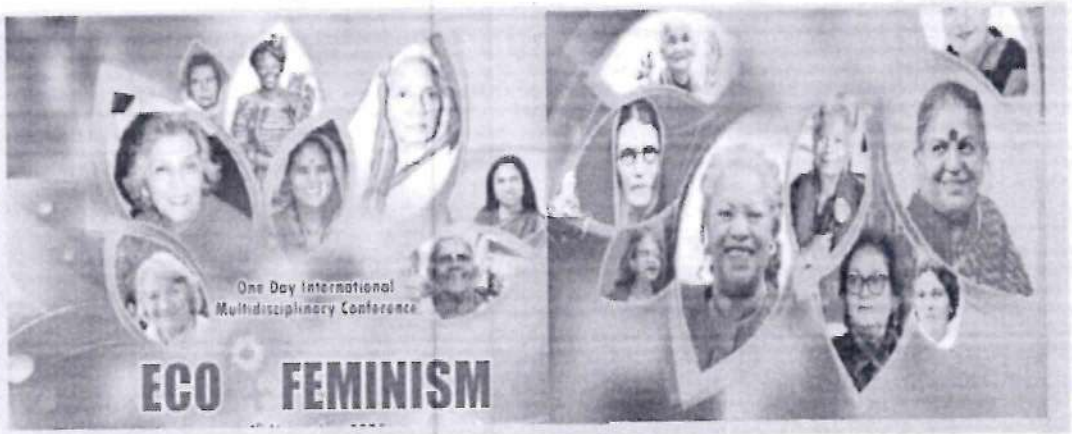

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कोणत्याही समाजामध्ये एक विशिष्ट अशी आचरण पद्धती निश्चित केलेली असते. या पद्धतीनुसारच तो समाज सामाजिक क्षेत्रात आचरण करीत असतो. या आचरणाच्या आधारे जीवन जगत असताना समाजातील हे लोक सोबत निश्चित केलेल्या परंपरा जपत असतात. या परंपरा जपून हा समाज सामाजिक मूल्यासोबत मानवीय आणि धार्मिक मूल्यांचीही जोपासना करीत असतो. ही मूल्ये विविध समाजात विविध प्रकारची असू शकतात. परंतु, त्यांचा पगडा त्या–त्या समाजावर मोठ्या प्रमाणात असतो. या सर्व आचरण पद्धतीचे एकत्रित स्वरूप म्हणजे संस्कृती होय. म्हणूनच मानवी संस्कृतीची जशी मानवतावादी मूल्ये निश्चित करण्यात आली आहेत तशीच मूल्ये आणि तत्व विविध प्रकारच्या संस्कृतीमंध्ये निश्चित करण्यात आली असल्याचे दिसून येते.

मानवी जीवनात वैयक्तिक व सामुदायिक अशी एक जीवनपद्धती निश्चित केलेली असते. ही जीवनपद्धती सार्थकी लागावी म्हणून तो सातत्याने स्वत:वर आणि बाहेरच्या जगावर संस्कार करीत राहतो. यातून जो अविष्कार घडतो, तीच संस्कृती होय.[१]

तर्कतीर्थ लक्ष्मणशास्त्री जोशी यांनी संस्कृतीची व्याख्या करताना म्हटले आहे की, मनुष्य व्यक्तिश: व समुदायश: जी जीवनपद्धती निर्माण करतो आणि जीवनसाफल्यार्थ स्वत: व बाह्य विश्वावर संस्कार करून जे अविष्कार करतो ती पद्धती म्हणजे संस्कृती होय. सामाजिक शास्त्रे व तत्वज्ञान याबाबतच्या ज्ञानकोशात थोर अभ्यासक ई. बी. टेलर यांनी संस्कृतीसंबंधी केलेल्या व्याख्येनुसार, Culture or Civilization is that complex whole which includes knowledge belief, art, morals, law, customs and any other capabilities and habits acquired by man as a member of society. jsMfDyQ czkmu ;kaP;kuqlkj] All kinds of social phenomena - morals, law, etiquette, religion, government, economics, education, language-need to be studied not in abstraction or isolation, but in their direct and indirect relations to social sturcture i.e. with reference to the way in which they depend upon or affect the social relations between persons and groups of persons.[2]

'ओम सह नाववतु। सह नौ भुनक्तु। सह वीर्यं करवावहै। तेजस्वि नावधीतमस्तु मा विदविशावै। ओम शांति: शांति: शांति:' हा मूळ प्राचीन काळातील यजुर्वेदातून आलेला मंत्र भारतीय संस्कृतीचीच दीक्षा देतो. ईश्वराने आम्हा गुरू आणि शिष्य, दोघांचेही रक्षण करावे, पालन–पोषण करावे, दोघेही पूर्ण शक्तिनिशी कार्यरत राहावे. आम्ही तेजस्वी विद्या प्राप्त करावी आणि आपसांत कधीही द्वेषभाव बाळगू नये... सर्वत्र शांती नांदावी, अशी शिकवण यातून मिळते.

डॉ. इरावती कर्वे यांच्या 'मराठी लोकांची संस्कृती' या पुस्तकात संस्कृतीची व्याख्या मांडताना कर्वे यांनी म्हटले आहे की, 'मनुष्यसमाजाची डोळ्यांना दिसणारी भौतिक वस्तुरूप निर्मिती व डोळ्यांना न दिसणारी पण विचारांना आकलन होणारी मनोमय सृष्टी म्हणजे संस्कृती होय.'[३]

सृष्टीमध्ये मानव जातीमध्ये भौतिकदृष्ट्या साधर्म्य असले तरी भौगोलिक विचार करता पाश्चात्य, पूर्व किंवा युरोपीयन संस्कृतीपेक्षा भारतीय संस्कृतीत खूप मोठ्या प्रमाणात वेगळेपणा जाणवतो. हे वेगळेपण जागतिक पातळीवर मान्यच करावे लागते. त्याच प्रकारे भारतीय संस्कृतीतही महाराष्ट्र, गुजरात, कर्नाटकी, आसामी, बंगाली अशा प्रादेशिक भागानुसार वेगळेपणा आहे. या भागांत वेगवेगळ्या परंपरा आहेत. हा वेगळेपणा अर्थातच संस्कृतीचा आहे.[४]

भारत हा जसा बहुभाषिक देश आहे तसाच विविध संस्कृती आणि परंपरांनी नटलेला देश आहे. या विविध संस्कृती वर्षानुवर्षे एकत्रितपणे नांदत आहेत. या प्रत्येक संस्कृतीमंध्ये वेगवेगळ्या परंपरा असल्याचे दिसून येते. याचे एकत्रित स्वरूप म्हणजे भारतीय संस्कृती होय. अनेकविध संस्कृतींच्या संघर्षाने व साहचर्याने ही संस्कृती तयार झाली आहे. या संस्कृतीच्या परंपरांच्या माध्यमातून प्रत्येक व्यक्ती आपल्या मनातील श्रद्धांचे पालन करीत असतो. मानव्यशास्त्रीय दृष्टिकोनातून विचार करता या परंपरा आणि श्रद्धा कोणत्या ना कोणत्या महान संदर्भांनी जोडल्या गेल्या आहेत. या परंपरांमध्ये कधी मानवी मूल्यांची शिकवण असते, तर कधी कौटुंबिक नात्यांच्या

खुरपणी असो, या शेतीकामांतून स्त्रीया कायम पर्यावरणाशी जोडलेल्या असतात. अप्रत्यक्षपणे त्या पर्यावरणाचे संवर्धन करण्यात गुंतून राहतात.

५ जून हा जागतिक पर्यावरण दिन म्हणून साजरा केला जातो. या पर्यावरणाशी स्त्रियांचा असलेला अतूट संबंध सातत्याने दिसून येतो. निसर्गात जशी सृजनशीलता आहे, तशीच ती स्त्रियांच्याही अंगी आहे. मूल जन्माला घालण्यापासून संसार सांभाळत त्याचे पालन–पोषण करण्याची जबाबदारी सांभाळताना स्त्री ही निर्मितीचा पूर्ण आनंद घेत असते. निसर्गाचेही हेच तत्त्व आहे. म्हणूनच स्त्रिया कोणतीही गोष्ट नष्ट करण्यापेक्षा त्याची जपणूक आणि नवनिर्मितीवर भर देतात. म्हणूनच पर्यावरण रक्षणाच्या लढ्यातही स्त्रिया अग्रभागी असल्याचे दिसून येते. २०१९चा पद्मश्री पुरस्कार सालूमरदा थिमक्का यांना देण्यात आला. कारण, त्यांनी एक–दोन नव्हे, चारशे रोपटी लावली, सांभाळली आणि आज त्याचे मोठ–मोठे वृक्ष झाले आहेत. कर्नाटकात बंगळुरूजवळ हुळीकल ते कुडूर मार्गावर वटवृक्षांची जी रांग दिसते, ती सालुमारदा यांच्याच परिश्रमातून उभारलेली आहे.[६] अशीच पर्यावरण रक्षणाची कामगिरी आंध्र प्रदेशातील ७५ खेड्यांत राहत असलेल्या सुमारे ५ हजार महिला करीत आहेत. या महिला पर्यावरण रक्षणाचे महत्त्व ओळखून हवामानबदलाचा मुकाबला करण्यासाठी वेगळ्या पद्धतीने शेती करीत आहेत. एका एकरात १९ प्रकारची पिके या महिला काढतात.

भाद्रपद महिन्यातील शुक्ल पक्षाची तिसरी तिथी म्हणजे हरतालिका. धार्मिक महत्त्व असलेल्या हरतालिका वृतामध्ये पर्यावरणासह आयुर्वेदाचेही महत्त्व आहे. स्त्रिया अत्यंत भक्तिभावाने हे व्रत करतात. या दिवशी भगवान शिवाला १६ प्रकारची पत्री अर्थात पाने अर्पण केली जातात. ही पत्री ज्या झाडांशी संबंधित असते ती झाडे ऑक्सिजनयुक्त पर्यावरणाच्या दृष्टीने तर यातील अनेक पत्री आयुर्वेदाच्या दृष्टीने महत्त्वाच्या असतात. अशा प्रकारे मराठी संस्कृतीत पर्यावरणाचे महत्त्व टिकून राहावे यासाठी महिला आणि निसर्ग किंवा पर्यावरण यांचा अनन्यसाधारण संबंध जोपसण्यात आला आहे. नागपंचमीला केली जाणारी नागाची पूजा असो, संक्रांतीच्या दिवशी सुगड्यांमध्ये पिकांची उत्पादने ठेवून केली जाणारी पूजा असो, या प्रत्येकात पर्यावरणाचे महत्त्व अधोरेखित होत असल्याचे दिसून येते.

मराठी संस्कृती ही अत्यंत समृद्ध संस्कृती आहे.या मराठी मुलुखाला पुरातन काळापासून संत परंपरेची अनमोल देण आहे. संत ज्ञानेश्वरांनी या परंपरेचा पाया घातला. यानंतरच्या काळात या परंपरेत अवतार घेतलेल्या सर्वच संतांनी सामाजिक मूल्यांसोबत निसर्ग रक्षणाचे भान या समाजास दिले. संत ज्ञानेश्वर महाराज ज्या वृक्षाखाली बसून ध्यानमग्न होत तो अजाण वृक्ष आज सातशे वर्षे उलटून गेली तरी आळंदीत श्री ज्ञानरायांच्या समाधीजवळ उभा आहे. याच परंपरेत संत श्री तुकाराम महाराज यांनी तर वृक्षवल्ली आम्हा सोयरी म्हणत पर्यावरणाचे महत्त्व पंधराव्या शतकात सांगितले होते. याच मराठी संस्कृतीने स्त्रियांचे पर्यावरणीय दृष्टीने असलेले निसर्गाशी ऋणानुबंध अधिक घट्टपणे मांडले. तीच संस्कृती आजही पर्यावरणीय स्त्रीवाद जोपासत असल्याचे दिसून येते.

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ता. कवठेमहांकाळ जि. सांगली.
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साहित्य, संस्कृती आणि समाज यांचा अनन्यसाधारण असा संबंध आहे. किंबहुना समाजाच्या अंतरंगामध्ये जी उलथापालथ घडते, ज्या घटना घडतात त्या घटनांचे प्रतिबिंब हे संस्कृतीमध्ये उतरते आणि समाज जीवनातल्या मूल्य व्यवस्थेतून संस्कृती आकाराला येत असते. त्यामुळे समाज आणि संस्कृती यांचा जसा निकटचा संबंध आहे तसाच समाज आणि साहित्य यांचाही निकटचा संबंध आहे. याचे कारण असे की, समाजामध्ये जी घटीते घडतात आणि समाजामध्ये ज्या वास्तवाचा प्रत्यय येतो त्याचेच निखळ प्रतिबिंब आपल्याला साहित्यामधून बघायला मिळते. त्यामुळे साहित्य समाज आणि संस्कृती या परस्परांशी निगडित असलेल्या गोष्टी आहेत समाजामध्ये श्रमिक वर्ग असतो. श्रमिक लोक श्रम करतात. मोबदल्याच्या अपेक्षेने शारीरिक अथवा बौद्धिक स्वरूपाची कृती करतात. याच श्रमिकांच्या श्रमणातून संस्कृती तयार होते असते तिला श्रम संस्कृती असे म्हटले जाते. श्रमिकांचे जे कार्य आहे ते म्हणजेच श्रमण होय. आणि या श्रमणातून आकाराला आलेली जी संस्कृती आहे ती श्रमण संस्कृती होय. वास्तविक श्रमण संस्कृती आणि साहित्याला अगदी प्राचीन परंपरा आहे. या प्राचीन परंपरेतून वर्तमानापर्यंत प्रवास झालेल्या या श्रमण साहित्य आणि संस्कृतीचे जागतिक शांततेसाठी कोणते योगदान आहे याचा विचार करावयाचा आहे. तत्पूर्वी जागतिक शांततेची गरज काय हे पाहणे आवश्यक आहे.

जागतिक शांततेची गरज :

जागतिक शांततेची गरज आज कधी नव्हे एवढी निर्माण झालेली आहे. याचे कारण असे की, आज औद्योगिक क्रांती झाली. इंटरनेट क्रांती झाली. विज्ञानामध्ये प्रचंड मोठ्या प्रमाणावर उलथापालथ झाली. याचा परिणाम समग्र मानवी जीवनावर झाला. येणाऱ्या काळामध्ये आज आपण कल्पनाही करू शकत नाही इतक्या मोठ्या प्रमाणावरच्या उलथापालथी होण्याची केवळ शक्यताच आहे असे नाही तर त्या शक्यता सत्यात सुद्धा येतील अशी परिस्थिती निर्माण झालेली आहे. त्यामुळेच एका बाजूला मानवी जीवनात भौतिक सुविधा आणि नवीन संशोधन, नवीन शोध हे दिसतात. दुसऱ्या बाजूला या सगळ्या विज्ञान तंत्रज्ञानाच्या प्रगतीमुळे असेल किंवा या सगळ्या आधुनिक विचारांच्या मुळे असेल मानवी जीवनामध्ये काही बदल सुद्धा घडून येत आहेत. या सर्वांचा परिणाम हा मानवी संस्कृतीवर आणि मानवी जीवनावरती होताना दिसतो. अशा काळामध्ये माणसाचं स्वास्थ्य खंडित झाले आहे. समुदाय, राष्ट्रे, धर्म, प्रांत यांमध्ये मोठ्या प्रमाणावरती हिंसेचे टोक गाठले आहे. अलिकडच्या काळामध्ये जगाच्या वेगवेगळ्या भागांमध्ये ज्या पद्धतीने हिंसक घटना घडत आहेत त्यावरून आपल्याला असे अनुमान काढता येते की, जर या हिंसक घटना आणि जर हिंसक क्रिया-प्रतिक्रिया अशाच सुरू राहिल्या तर येणाऱ्या काळामध्ये जग हे हिंसेच्या वणव्यात होरपळले जाऊ शकते. आणि त्याची चुणूक अलीकडच्या काळामध्ये दिसून आलेली आहे. अशा काळामध्ये श्रमण साहित्य आणि श्रमण संस्कृतीतील मूल्ये ही जगाला शांततेसाठी योगदान देत राहतील. वास्तविक जग हे एका महायुद्धाच्या उंबरठ्यावर आहे. एक अदृश्य प्रकारचा ताण आणि तणाव मानवी जीवनामध्ये आणि संपूर्ण जगातल्या मानवी समुदायांमध्ये दिसून येतो आहे. त्यामुळे जागतिक शांततेची गरज आहे. त्यामुळेच जे काही विचारवंत, प्रज्ञावंत व विद्वान लोक आहेत ते जागतिक शांततेसाठी काम करताना दिसत आहेत. खरेतर संयुक्त राष्ट्रसंघाने सुद्धा जागतिक शांततेसाठी कृती कार्यक्रम आखलेला आहे.

श्रमण संस्कृती म्हणजे काय :

श्रमण संस्कृती म्हणजे काय याचा पहिल्यांदा आपल्याला विचार करावा लागेल. या संस्कृतीचे साहित्यामध्ये कसे प्रतिबिंब पडले आहे याचाही आपल्याला शोध घ्यावा लागेल. मुळात श्रमण हा शब्द श्रम या धातूपासून निर्माण झालेला आहे. श्रम करणे म्हणजे कष्ट करणे, मेहनत करणे असा त्याचा अर्थ होतो. मानवी जीवन अधिक सुकर आणि परिपूर्ण व प्रगल्भ बनवणे हे ज्या कृती मधून घडते त्यालाच आपण श्रम करणे असे म्हणतो.

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तिच्या विधानातून तिचे वेदनादायी जीवन स्पष्ट होते. खरेतर श्रम करण्याची वेदना संपुष्टात यावी आणि एक समृद्धीचे जीवन त्यांच्या वाट्याला यावे हीच कोणत्याही साहित्यिकाची मनोभूमिका असते. साहित्यिक याच भावनेतून लिहीत असतात हे आपल्याला महादेव मोरे यांच्या या कथेतून पहावयास मिळते. आणि अशा श्रमकऱ्यांच्या स्वप्नसृष्टीचा कलात्मक आलेख या साहित्यातून दिसतो. व्यवस्थेने नाकारलेल्या आणि ज्यांचा श्रमाचा गैरफायदा घेतला जातो अशा स्त्रियांची भावदृष्टी शांततामय निकोप समाजासाठी कशी आसुसलेली असते याचा प्रत्यय आपल्याला मेघना पेठे यांच्या 'नतिचरामी' या कादंबरीमध्ये पाहायला मिळतो. त्यांची मीरा ही नायिका आपली स्वप्नसृष्टी उलगडताना म्हणते, ''मला पोशिंदा नको आहे. संरक्षक पोलीस नको आहे. मात्र नेकिने आणि उत्साहाने जगणारा आणि जगू देणारा निरोगी प्रामाणिक, सहचर सोबती हवा आहे.''[४] खरंतर स्त्रीच्या श्रमाचा पुरुषी व्यवस्थेने नेहमीच गैरफायदा घेतलेला असताना एक श्रमकरी स्त्री जीवनाचे किती भव्य आणि उदात्त स्वप्न रंगवते आहे हेच या साहित्यकृतीतून पहावयास मिळते. अशा या साहित्यातील मूल्येच वैश्विक पातळीवरती शांतापूर्ण, निरामय अशा उमद्या सहजीवनासाठी प्रत्यक्ष अप्रत्यक्षरीत्या कार्य करतात. मराठी साहित्य, भारतीय साहित्य आणि एकूणच वैश्विक साहित्याच्या पार्श्वभूमीवर आपल्याला अशी असंख्य उदाहरणे देता येतील की, ज्या साहित्यातून श्रमाकऱ्यांच्या संस्कृतीचे एक विराट दर्शन होते. श्रमाकऱ्यांच्या सांस्कृतिक मूल्यांच्या आधारे जागतिक शांततेसाठी श्रमण साहित्य व संस्कृती कार्यरत आहे समजून येते.

समारोप :

जागतिक शांततेसाठी निश्चितपणाने श्रमण साहित्याचा मोठा वाटा आहे. जगभरामध्ये जे श्रमिकांचे व कष्टकऱ्यांचे साहित्य आहे त्या साहित्याने जगातल्या शांततेचे स्वप्न बघितले आहे. भांडवली, सरंजामदारी अशा मूल्यवस्थेतून आकाराला आलेल्या समाज व्यवस्थेला बाजूला सारत शांततेवर आणि समतेवर आधारलेले एका सुंदर जगाचे स्वप्न हे श्रमण साहित्य पाहते. जगावर प्रभाव टाकणाऱ्या सर्वच धर्मीयांच्या मध्ये श्रमण साहित्याला मानाचे स्थान आहे.हाही निष्कर्ष आपल्या हाती येतो. या सर्व बाबींचा विचार करता जागतिक शांततेसाठी श्रमण साहित्याने मोठे प्रयत्न केले आहेत आणि या श्रमण संस्कृती साहित्याचे मोठे योगदान आहे.

संदर्भ :

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BUILDING A LIBRARY WEBSITE WITH GOOGLE SITES: A CASE STUDY OF PVP COLLEGE LIBRARY, KAVATHE MAHANKAL

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Abstract:

This research article presents a comprehensive case study on the development of a library website using Google Sites at PVP College Library in Kavathe Mahankal. The objective of this study was to explore the features and benefits of Google Sites as a free web development tool for creating an effective and user-friendly library website. The research methodology employed in this study involved a combination of a literature review, an analysis of existing library websites, and the practical implementation of Google Sites for the PVP College Library. The case study showcases the website sections, including circulars, news and events, library at a glance, new arrivals, N-list quick access, photo gallery, social sites, about us, electronic resources, college repository, subscribed resources, open access resources, old question papers, online e-newspapers, Vasant magazine, students' section, useful links, ask a librarian, and contact us. The findings of the case study highlight the advantages and limitations of using Google Sites for library website development and provide valuable insights for other libraries seeking to improve their online presence.

Keywords:

Library Website, Information Resources, Web Site, Home Page, Open Access, Open Source, E-Resources.

Introduction:

In the digital age, library websites have become essential tools for libraries to expand their services and engage with a wider audience. These websites serve as virtual gateways, connecting users to vast resources and services offered by the library. A well-designed library website enhances user experiences, facilitates access to information resources, and fosters meaningful interactions between the library and its users. It provides a seamless and intuitive interface for users to explore the library's collections, including books, journals, multimedia materials, and other resources. The website also serves as a platform for accessing electronic resources, such as e-books, e-journals, databases, and digital archives.

Keeping users informed about the latest news, events, and activities is another crucial aspect of a library website. It serves as a central hub for disseminating important announcements, creating a sense of community and keeping users engaged. Interactivity and user engagement are key features of a modern library website, allowing users to interact with library staff, ask questions, seek assistance, and provide feedback. Online forms and chat services can facilitate communication between users and librarians. Social media integration enables libraries to extend their reach and connect with users through popular platforms like Facebook, Twitter, and Instagram, fostering a sense of community, encouraging discussions, and promoting user-generated content.

Choosing the right web development tool is crucial for creating an effective library website that meets user expectations and aligns with the library's objectives. Google Sites, a free web development tool, offers a user-friendly interface, drag-and-drop functionality, and seamless integration with other Google services, making it accessible for library staff with limited technical expertise to create and maintain a visually appealing and functional website.

Objectives:

- To explore the features and functionalities of Google Sites as a free web development tool for creating a library website.
- To develop a user-friendly and informative library website for PVP College Library using Google Sites.
- To provide recommendations and best practises for utilising Google Sites in library website development

Review of Literature:

A library website should accurately reflect its mission and guiding principles. The website queue is the only means for a library to make services available to customers. The main focus of the essay is how crucial a standard website is, regardless of how a library is structured. It highlights the precision and dependability of the content supporting the website. Additionally, evaluation standards for the typical website are covered. The Eight New Indian Institute of Technology (IIT) has offered a comparative analysis of the website content available. Paper might be considered a single-source manual for building a website for a big or small library. Important Terms: Wiki, Web Contents, Blogs, and Library Users.(Kumar & Bansal, 2014)

The creation of home pages is becoming more and more of a focus for libraries, and website design software has filled a void in the web design industry. Users don't need to hire expensive designers to build their dream websites; all they need is a computer, internet access, and software. This strategy makes the process of

creating websites more pleasurable and accessible. With the help of the website builder, people may design their own websites without the need for technical expertise or experience. The tool intends to make website building easy, accessible, and pleasurable. As a result, internet design is now more accessible and diversified, enabling libraries to make their own distinctive websites that are interesting to visitors..(Bangalore & Y, 2012)

The current state of the content on the websites of university libraries in India. Establishes a technique for evaluating the performance of library websites in terms of their overall website performance calculation (OWPC) and criteria-wise website performance calculation (CWPC). 20 core universities and 19 important national institutions, including Indian universities, were compared. According to the defined criteria, academic libraries from Indian Institutes of Technology (IITs) and Indian Institutes of Management (IIMs) contend that central university library websites lack the content knowledge of institutes of national importance. The evaluated criteria could help librarians and webmasters increase the level of content awareness on their library websites.(Shukla & Tripathi, 2010)

Library websites offer interaction with the library catalogue, allowing users to renew or request items. Libraries can organize periodicals, electronic reference collections, and subscribed databases. This study focuses on creating and setting up an OPAC process to help identify books and link them to library websites. The goal is to provide a comprehensive resource for users to access and utilize library resources.(Nagaiah et al., 2021)

Research Methodology:

The present study's research method employed a step-by-step approach. First, a thorough literature research was carried out to obtain information on the best practices for creating library websites. This involved looking at scholarly books, journals, and internet resources about user experience, usability, and website design. In order to find common characteristics and functionalities that could be implemented into the PVP College Library website, an investigation of current library websites was also done. The website components were constructed based on the given needs, and Google Sites was finally integrated as the web construction tool.

Free Website Developing Tools:

This provides an overview of various free web development tools available on the market. It discusses the advantages and limitations of using free tools for creating a library website, including considerations such as cost-effectiveness, ease of use, scalability, and customization options.

There are several free website development tools available that can help you create and design a website without having to write code from scratch. Some popular options include:

1. **Word Press** is a well-known content management system, enabling you to build a website with an intuitive interface..
2. **Wix** is a website builder that offers drag-and-drop functionality and configurable themes for building websites.
3. **Weebly** is another website builder that offers a simple drag-and-drop interface and customizable templates.
4. **Google Sites** is a free website builder that allows users to create basic websites quickly and easily. It offers a range of customizable templates and integrates with other Google services like Google Drive Google's tools and templates.
5. **Bootstrap** is a front-end development framework that allows you to create responsive websites with pre-built components.
6. **GitHub Pages** is a hosting service that allows you to create a website using GitHub's repository and hosting tools.
7. **Joomla:** Joomla is a content management system that provides a selection of website creation and administration templates and add-ons.
8. **Drupal:** Another well-liked content management system, Drupal provides a selection of editable website layouts and modules.
9. **Magento:** This open-source e-commerce platform provides a number of tools for building online stores, including customizable layouts and plugins.
10. **Shopify:** A well-liked e-commerce platform, Shopify enables customers to easily develop and manage online stores. It integrates with well-known payment systems and offers a selection of customisable designs and features.

These tools may have limitations in terms of customization and functionality, but they can be a great starting point for building your own website.

Introduction to Google Sites:

Google Sites is introduced as a popular and user-friendly web development tool suitable for creating library websites. The section highlights the platform's simplicity and its drag-and-drop interface, which allow users to build websites without any coding knowledge. Additionally, Google Sites enables collaboration among multiple users, making it suitable for library staff to contribute to the website's content and maintenance.

Features of Google Sites:

This explores the key features of Google Sites that make it a suitable choice for building a library website. It covers customizable templates, responsive design, integration with other Google services (such as Google Drive, Google Calendar, and Google Maps), and the ability to embed multimedia content. The user-friendly interface and intuitive editing options are emphasised, enabling librarians to update and manage the website easily.

Advantages of Using Google Sites:

- Google Sites is an accessible, cost-effective, and user-friendly solution for developing and maintaining a library website. It offers a user-friendly interface, seamless integration with Google Workspace, and a responsive design that ensures your website looks and functions well on smartphones and tablets. Google Sites is free to use, making it a cost-effective solution for libraries with limited budgets.
- The platform also offers customization options, allowing users to choose from different themes, colours, fonts, and layouts to match their branding and style. Multiple people can work on the same Google Site simultaneously, allowing for collaboration among staff members and streamlining the website development process.
- Google Sites is hosted on Google's servers, ensuring security and reliability. It supports embedding multimedia elements, allowing for engaging content and showcasing library resources, events, and services effectively. It can accommodate the needs of both small and large libraries, ensuring accessibility and responsiveness even with increased traffic or content.
- Google Sites integrates with Google Analytics, providing valuable data and insights about your library website's performance. By tracking metrics such as visitor traffic, popular pages, and user behaviour, libraries can make data-driven decisions to enhance the user experience and optimize the site's effectiveness. Overall, Google Sites is an accessible, cost-effective, and user-friendly solution for libraries to provide valuable online resources and services to their patrons.

Introduction to PVP College Library:

Established in 1978, the Padmabhushan Vasantraodada Patil Mahavidyalaya Library is a vital resource centre for the college community. With a substantial collection of 85,000 books and 68 print periodicals, the library caters to the academic needs of the college community. As a member of the N-LIST program, facilitated by INFLIBNET, the library offers access to over 200,000 e-books and 5000+ full-text periodicals. The N-LIST program provides free access to over 30 lakh e-books and

over 6,000 electronic periodicals, enabling students and faculty members to conduct in-depth research and expand their knowledge base. The library's digital resources contribute to the development of critical thinking skills, information literacy, and independent research abilities among the college community.

Regular updates and additions to the digital collection ensure relevance and current resources are provided to users. The Padmabhushan Vasantraodada Patil Mahavidyalaya Library promotes a culture of lifelong learning and intellectual growth among its students and faculty. PVP library website can be accessed at **https://sites.google.com/view/pvplibrarykm** it is a dynamic website.

PVP Library Website Sections:

This library provides a detailed description of the various sections and pages included in the PVP library website developed using Google Sites. Each section is explained in brief, including its content, and functionalities.

- **Home Page:** The home page serves as the central hub of the website and includes sections such as

o Circulars:

o News and Events:

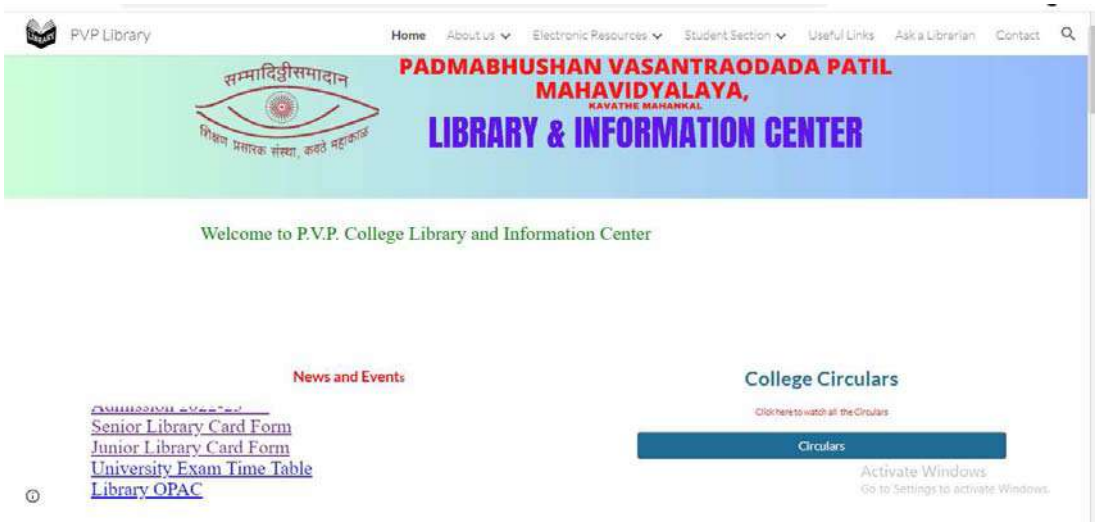
o Library at a Glance:

o New Arrivals:

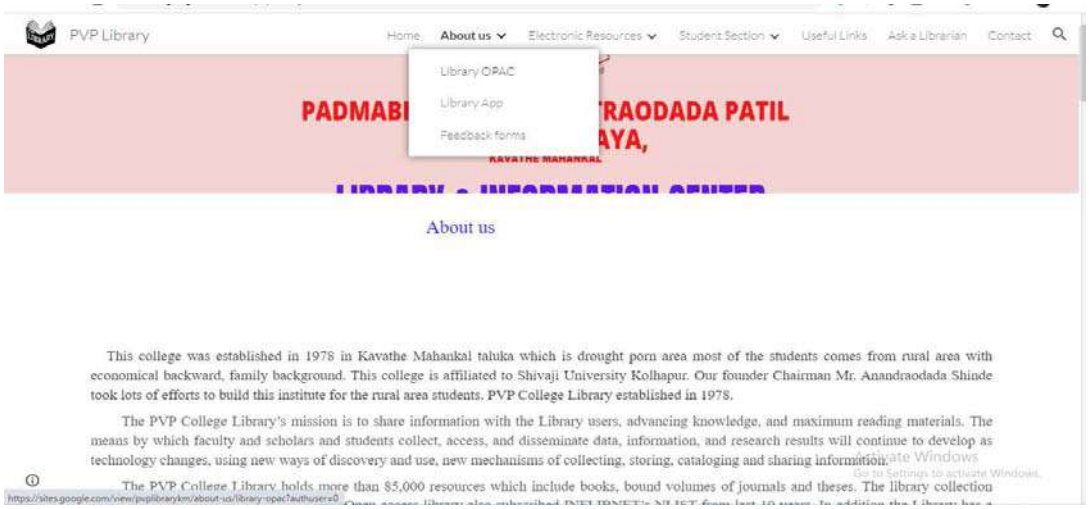
o N-List Quick Access:

o A Photo Gallery:

o Social Sites:

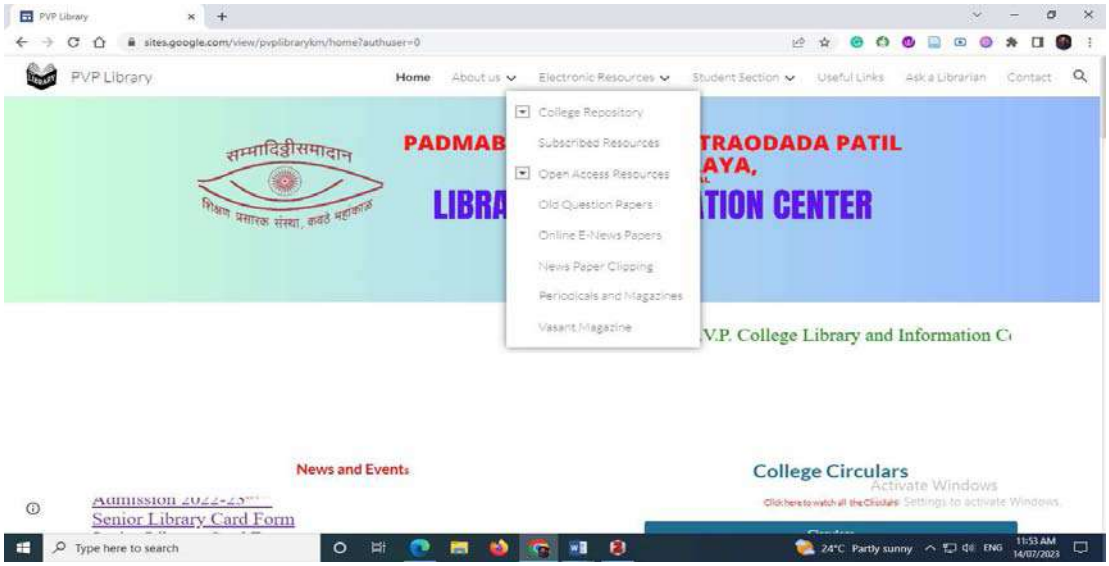


- **About Us:** This page provides information about the library, including its
  - Online Public Access Catalogue (OPAC):
  - Library App:
  - Library Feedback Form:



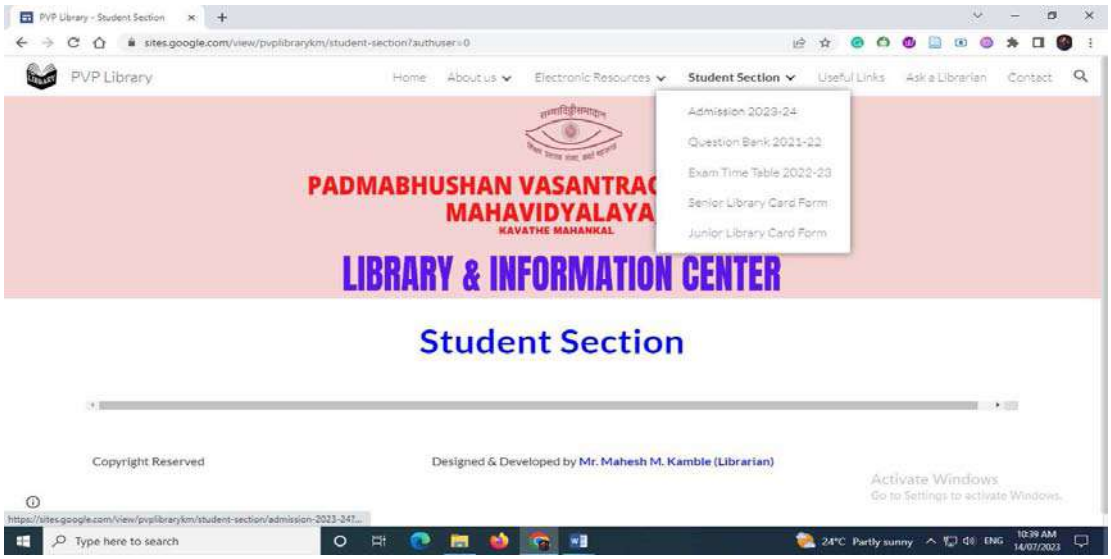
- **Electronic Resources:** This page highlights the library's electronic resources, including the
- **College Repository: which contains**
  - M.Phil. and Ph.D. theses:
  - major projects:
  - Minor projects:
  - MRP final reports:
  - research articles:
  - departmental blogs:
- **Subscribed Resources:** INFLIBNET's NLIST
- **Open Access Resources:** Such As
  - E-Books:
  - E-Journals:
  - E-Theses:
  - Specific Subject Gateways:

- Other Institutional Repositories:
- Virtual Labs:
  - **Old Question Papers:** This Page provides access to old question papers for all classes, allowing students to review previous examinations. Students can obtain and examine prior exam question papers on the library's website in the area titled "Old Question Papers." Students can better prepare for forthcoming exams by being familiar with the exam structure and question types thanks to this useful resource.
  - **Online E-Newspapers:** Users can access online editions of various newspapers through this section, providing them with current news and information. Users get easy access to a variety of newspapers in digital format through the Online E-Newspapers area. Users may stay informed about current events and keep up with the newest news, articles, and information from a variety of sources, which will help them learn more.
  - **Vasant Magazine:** The College's annual magazine, Vasant, is showcased in this section, allowing users to browse through past issues. This area acts as the magazine's digital archive, giving readers the chance to explore stories, features, and original works from earlier issues while also preserving the College's history and accomplishments.



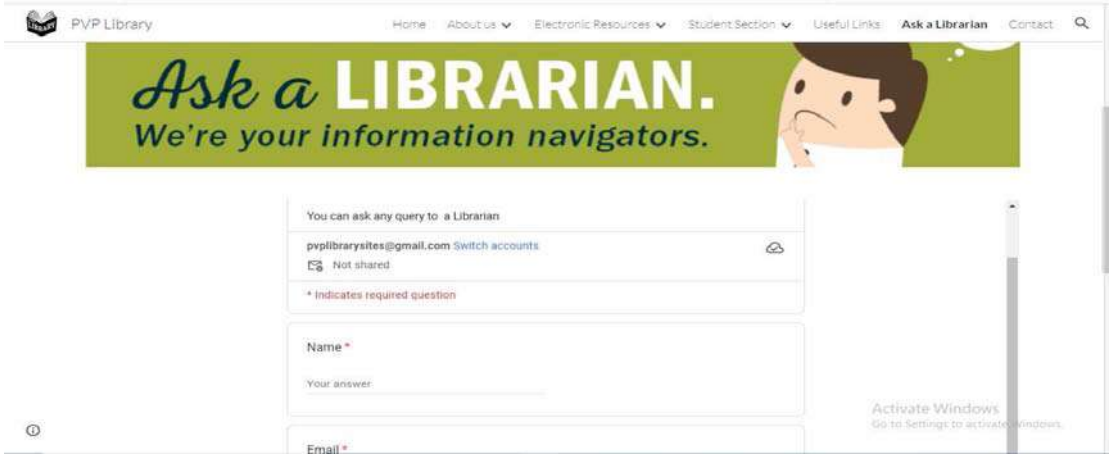
- **Students' Section:** This section caters specifically to students, providing information about the

- **Admission Process:** This section contains comprehensive details regarding the college's admissions system, including application guidelines, eligibility requirements, deadlines, and any necessary supporting papers. It acts as a manual for prospective students, assisting them as they go easily through the entrance criteria.
- **Question Bank:** Students get access to a database of test questions from previous years as well as a selection of practice questions in this part, called Question Bank. It helps students prepare for exams by giving them access to a variety of sample questions so they may practise and become comfortable with the exam structure.
- **Examination Timetable:** Students can view the schedule of upcoming exams under the subsection titled "Examination Timetable." It gives information about each exam, such as the date, time, and location, enabling students to efficiently arrange their study schedules and make sure they are well-prepared for their exams.
- **Junior Library Card Form:** Students can view and complete the junior library card application in this area. Students within a specified age range generally receive junior library cards, giving them access to the collection's materials and services.
- **Senior Library Card Form:** Students can access and complete the application for a senior library card by going to the Senior Library Card Form part. Higher-level students often receive senior library cards, which give them greater access to library materials and services.



- **Useful Links:** A compilation of useful links relevant to library resources, research tools, and educational websites Marathi Vishwakosh, Dictionary by Farlex, Dictionary, Wikipedia, Reference Style Guide, Guinness Word\ld Records, Google Scholar, Maps of India, How Products are made, National Geographic, How stuff works, News Papers and is provided in this section.

- **Ask A Librarian:** The Ask a Librarian feature allows users to contact library staff via email for personalized assistance, ensuring timely responses to questions and concerns. It provides direct communication with knowledgeable professionals, enabling users to request research guidance, locate resources, and seek general information.



- **Contact Us:** The library's Contact Us section provides multiple communication channels for users to reach staff, including email addresses, landline phone numbers, and mobile phones. This section aims to facilitate easy and efficient interaction between users and staff members, ensuring a smooth and convenient experience.

Suggestions for Further Studies:

Further studies could focus on evaluating user satisfaction and usability of the website and conducting user surveys or focus groups to gather feedback and suggestions for improvements. Exploring emerging technologies such as artificial intelligence, chat-bots, or personalised recommendation systems could also enhance the user experience and support information retrieval.

Conclusion:

A well-designed library website is a vital component in today's digital landscape. It serves as a gateway to the library's resources and services, offering users the convenience of accessing information anytime and anywhere. By leveraging appropriate web development tools, such as Google Sites, libraries can create user-friendly websites that enhance user experiences, promote engagement, and contribute to the overall mission of the library by disseminating knowledge and fostering lifelong learning.

In conclusion, the Padmabhushan Vasantraodada Patil Mahavidyalaya Library has recognised the significance of a well-designed library website in providing seamless access to its extensive collection and services. By utilising Google Sites, the library has created an intuitive and user-friendly online platform that caters to the needs of its diverse user base.The website encompasses various sections, such as the Home Page, About Us, Electronic Resources, College Repository, Subscribed Resources, Open Access Resources, Old Question Papers, Online E-Newspapers, Vasant Magazine, Students' Section, Useful Links, Ask A Librarian, and Contact Us. Each section is carefully curated to deliver relevant content, functionalities, and resources to the library's users, including students, faculty, researchers, and the wider college community. The library's website offers easy access to resources such as the online public access catalogue (OPAC),

electronic resources provided through the N-LIST programme, the college repository containing theses, projects, and research articles, subscribed resources, open access resources, old question papers, online e-newspapers, the Vasant magazine archive, and sections dedicated to students with admission details, question banks, examination timetables, and library card applications. Furthermore, the website incorporates features like a photo gallery, social media integration, library feedback forms, and the option to contact library staff for personalised assistance through the "Ask A Librarian" feature. Additionally, regularly updating and expanding the electronic resources section, including e-books, e-journals, and subject gateways, will ensure that users have access to the latest scholarly materials and research tools.

Overall, the Padmabhushan Vasantraodada Patil Mahavidyalaya Library has embraced the importance of a well-designed library website to meet the evolving needs of its users. By leveraging technology and continuously improving the website's functionality and content, the library can successfully disseminate knowledge, foster research, and provide an enriching digital experience to its users.

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INTERNATIONAL JOURNAL OF CURRENT SCIENCE (IJCSPUB)

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Diversity And Checklist of Avifauna From Kuchi , Jakhapur Water Tank And Its Surrounding Areas Of Kavathe Mahankal Tahsil (Dist- Sangli)

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Abstract:

The survey of avifauna was carried out from the Kuchi and Jakhapur water tank (Talav) and its surrounding Areas of Kavathe Mahankal Tahsil of Sangli district. This area is of low rainfall with hills and slopes with some bushy plants, grass and trees. Both the water tanks are full of water in rainy season. The study was carried out for four years September 2019 to August 2023. The nearby areas were largely agricultural. The principal crops taken being jawar, groundnut, sugarcane and grapes. On a smaller scale bananas are also grown. Birds play important role in biodiversity by keeping insect pest under control. Over 364 hectors of land is under well irrigation which play very important role to maintain the bird diversity. The area of Kuchi Tank is about about 100 acres and depth is about 30 feet; whereas the area of Jakhapur Tank is about 45 acres and depth is about 10 to 15 feet. This region shows good number of bird diversity during the month of September to December. This is because of availability of food and breeding ground. About 101 species belonging 84 genera from 49 families were recorded from the study area.

Key Words: Jakhapur, Kuchi, Avifauna and Diversity

Introduction

The birds are vertebrates has been described as a Feathered Biped. They are warm blooded animals (homeotherms). To assist in maintaining an even temperature, the body of a bird is covered with non-conducting feathers. Birds enjoy a wide distribution on the earth than any other class of animal. Birds are useful to human community such as destroyers of insect pests, as destroys of other vermin, as scavengers, as flower pollination agents, as seed dispersers, as food for man, feathers in cottage industry, and as fertilizer. [12]. The comparative study of birds reveal that there are recognizable differences in size, coloration and other details in those species which range over a wide area live under diversified natural conditions. Aynalem S and Bekele A. studied the species composition, relative abundance, and distribution of bird fauna of riverine and wetland habitats of Infranz and Yiganda at the southern tip of Lake Tana, Ethiopia [5]. Engelen D. [6] reported comparing avifauna communities and bird functional diversity of forest and farmland in southwest Ethiopia. According to Waltert et al [18] granivorous birds showed the highest species numbers in annual cultures and were significantly fewer species-rich in other habitat types. Nobody has worked on the diversity of avifauna of Kuchi and Jakhapu tank and its surrounding area Therefore we are going to explore the data for conservation of biodiversity in this area. The surrounding area of kuchi and Jakhapur tank isrich vegetation with hilly slopes and plateaus. The main source of water is many small nalas coming from nearby hilly area. During rainy season when Jakhapur tank overflow the water enters into Kuchi tank.

The main crop of this region is Sugarcane, grapes, groundnut, chillies and cereals. This region is mainly dominated by different plant species such as Acacia, Azadiracta, Tectona, Albizzia, Bamboo, Erythrina, Beautia, Terminalia, Eucalyptus, Lantena, Mangifera, Morinda, Tamarindus, Ficus and with different weeds. Hence support sustainable place for Avifauna. The vegetation cover of the field within the survey area was studied during the bird survey. The surrounding area of both the tanks were with field vegetation cover, which includes herbs and trees, home gardens, grassy and scattered group of trees, plantation of woodlots by local peoples. The home gardens are, various annual crops, and numerous kinds of vegetables many fruit plants. This high diversity of various plants was important source for bird diversity.

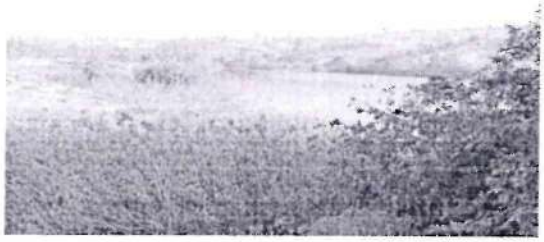
Methods and Materials

The study was conducted and taxonomic list of avifauna was recorded during the period of September 2019 to August 2023. The survey was carried out every month of year encompassing both wet and dry seasons.. The habitat, behavior of birds and movements and identification marks was observed by using binocular (Olympus 8- 16x4) zoom DPS 1 and eyes and also through sound. Identification was visual except in some rare cases when the voice will be used if the bird cannot be seen. Identification and categorization of birds to their respective taxonomic groups were done by following field guide books. 'The book of Indian Birds'by Salim Ali, A Field Guide to the Birds of India by Krys Kazmierczak, Birds by Herbert S. Zim, 'Birds of the Indian Subcontinent' Richard Grimmett *et.al.*[1] [,2]',[3], [9], [10], [11], [12], [13],[14].

Study area: Kuchi and Jakhapur belongs to Kavathe Mahankal Tahsil of Sangli district situated at $17^0$00'22.6728"N, latitude and 74^0 51'55.3392"E longitude having moderate rainfall. It is located at elevation of 2,087ft.; having moderate temperature zone and dry climate. Study area having moderate rainfall of average 500 mm. The climate is hot. Maximum temperature reaches up to 42^0 c in summer, while minimum goes down up to 19^0C. Fifty nine villages come under its constituency; of which Kuchi and Jakhapur with water bodies and Hilly areas and suitable ground for Birds habit and habitats.

Kuchi Tank

Jakhapur Tank



Results

The taxonomic Checklist of Avifauna from Kuchi and Jakhapur Water Tank and its Surrounding areas were - 101 species belonging 84 genera from 49 families. They are Resident of local (R), Migrant (M), Endangered (E). and Local Migrant (LM).

Sr No	Scientific Name	Common Name	Status
1	**FAMILY – Accpitridae**		
	i) *Pernis Ptilorhyncus*	Oriental honey buzzard	R
	ii) *Haliastur indus*	Brahminy kite	R
	iii) *Milvus migrans*	Indus Black kite	R
	iv) *Accipeter badius*	Shikra	R
	v) *Butastur teesa*	White eyed buzzerd	R
	vi) *Spizaetus limnaeetus*	Changeable hawk eagle	LM
	vii) *Aquila rapax*	Tawny eagle	R
	viii) *Halcyon smyrnensis*	White throated kingfisher	R
	ix) *Alcedo atthis*	Common kingfisher	R

	x) *Accipeter nisus*	Eurasian sparrow hawk	M
2	**FAMILY –Aegithinidae**		
	i) *Aegithinia tiphia*	Common iora	R
3	**FAMILY –Alaudidae**		
	i) *Eremopteriex griseos*	Ashy crowned finch lark	R
	ii) *Galerida malabarica*	Malabar creasted lark	R
	iii) *Ammomanes phoenicura*	Rufous tailed lark	R
4	**FAMILY-Apodidae**		
	i) Apus affinis	House swift	R
5	**FAMILY –Anatidae**		
	i) *Dendrocygna javanica*	Lesser whitling duck	M
	ii) *Anas crecca*	Common teal	M
	iii) *Ans acuta*	pintail	M
	iv)*Anas poecilorhyncha*	Spotbill duck	R
6	**FAMILY- Ardeidae**		
	i) *Egretta alba*	Great egret	R
	ii) *Egretta intermedia*	Intermediate egret	R
	iii) *Egretta garzetta*	Little egret	R
	iv) *Bubulcus coromandus*	Cattle egret	R
	v) *Ardea cinerea*	Grey heron	R
	vi) *Ardeola grayii*	Indian pond heron	R
7	**FAMILY- Bucerotidae**		
	i) *Ocyceros birostris*	Indian grey hornbill	R
8	**FAMILY- Capitonidae**		
	i) *Megalaima haemacephala*	Copersmith barbet	R
9	**FAMILY –Campephagidae**		
	i) *Pericrocotus cinnamomeous*	Small minivet	R
	ii) *Tephrodornis pondicerianus*	Common wood shrike	R
10	**FAMILY- Charadriidae**		
	i) *Vanellus malabaricus*	Yellow wattled lapwing	R
	ii) *Vanellus indicus*	Red wattled lapwing	R
	iii) *Charadius dubius*	Little ringed plover	R
11	**FAMILY –Ciconiidae**		
	i) *Ciconia episcopus*	White necked stork	R
	ii) *Mycteria leucocephala*	Painted stork	E
12	**FAMILY –Cisticolidae**		
	i) *Prinia socialis*	Ashy prinia	R
	ii) *Prinia inornata*	Plain prinia	R
	iii) *Orthotomus sutorius*	Common tailor bird	R
	iv) *Prinia hodgsonii*	Grey breasted prinia	R
13	**FAMILY- Columbidae**		
	i) *Streptopelia chinesis*	Spotted dove	R
	ii) *Columbo livia*	Rock pigeon	R
	iii) *Streptopelia* capicola	Ring necked dove	R
14	**FAMILY- Corcaciidae**		
	i) Coracias benghalensis	Indian roller	R
15	**FAMILY- Corvidae**		
	i) *Corvus splendens*	House crow	R
	ii) *Corvus* culminatus	Indian jungle crow	R
16	**FAMILY – Cuculidae**		
	i) *Cacomantis passerinus*	Grey bellied cuckoo	LM
	ii) Clamator jacobinus	Pied cuckoo	LM

	iii) *Eudynamys scolopaceous*	Asian koel	R
17	**FAMILY-Dicruridae**		
	i) *Dicrurus leucophaeus*	Black drongo	R
18	**FAMILY-Dicaeidae**		
	i) *Dicaeum erythrorhynchos*	Thick billed flower picker	R
	ii) *Dicaeum agile*	Pale billed flower picker	R
19	**FAMILY – Hirundinidae**		
	i) *Hirundo smithii*	Wire tailed swallow	R
	ii) *Hirund daurica*	Red -rumped swallow	R
20	**FAMILY- Laniidae**		
	i) *Lanius schach*	Long tailed shrike	R
	ii) *Lanius cristatus*	Brown shrike	M
21	**FAMILY** - Laridae		
	i)*Sterna aurantia*	Indian river tern	R
22	**FAMILY- Leiothrichidae**		
	i) *Turdoides malcolmi*	Large grey babbler	R
23	**FAMILY-Emberizidae**		
	i) *Emberiza melanocephala*	Black headed bunting	M
	ii) *Melophus lathami*	Crested bunting	R
24	**FAMILY-Estrildidae**		
	i) *Lonchura punctulata*	Scaly breasted munia	R
	ii) Euodica malabarica	Indian silver bill	R
25	**FAMILY- Glareolidae**		
	i) *Cursorius coromandelicus*	Indian courser	R
26	**FAMILY –Muscicapidae**		
	i) *Copsychus saularis*	Oriental magpie robin	R
	ii) *Luscini brunnea*	Indian robin	R
	iii) *Saxicola torquatus*	Common stone chat	R
	iv) *Cyornis tickelliae*	Tickell's blue flycatcher	M
27	**FAMILY-Meropidae**		
	i) *Merops orientalis*	Green bee eater	R
28	**FAMILY-Monarchidae**		
	i)*Terpsiphone paradisi*	Asian paradise flycatcher	LM
29	**FAMILY -Motacillidae**		
	i) *Motacilla alba*	White wagtail	M
	ii) *Motacilla cinerea*	Grey wagtail	M
	iii) *Motacilla flava*	Yellow wagtail	M
	iv) *Anthus rufulus*	Paddy field pipit	R
30	**FAMILY –Nectariniidae**		
	i) *Leptocoma zeylonica*	Purple rumped sunbird	R
	ii) *Cinnyris asiaticus*	Purple sunbird	R
31	**FAMILY-Paridae**		
	i) *Parus major*	Great tit	R
32	**FAMILY –-Passeridae**		
	i) *Passer domesticus*	House sparrow	R
33	**FAMILY –Pandionidae**		
	i) *Pandion halietus*	Osprey	M
34	**FAMILY –Ploceidae**		
	i) *Ploceus philippinus*	Baya weaver	R

35	**FAMILY –Phasianidae**		
	i) *Pavo cristatus*	Indian peafowl	R
	ii) *Coturnix coturnix*	Common quail	R
	iii) *Francolinus pondicerianus*	Grey francoline	R
36	**FAMILY-Phalacrocoracidae**		
	i) *Phalacrocorax carbo*	Great cormorant	R
	ii) *Phalacrocora xniger*	Little cormorant	R
37	**FAMILY - Picidae**		
	i) *Dendrocopos mahrattensis*	Yellow crowned woodpecker	R
38	**FAMILY - Podicipedidae**		
	i) *Tachybaptus ruficollis*	Little grebe (dabchick)	R
39	**FAMILY- Psittacidae**		
	i) *Psittaculan cyanicephala*	Plum headed parakeet	R
	ii) *Psittacula krameri*	Rose ringed parakeet	R
40	**FAMILY- Rallidae**		
	i) *Fulica atra*	Common coot	R
41	**FAMILY -Recurvirostridae**		
	i) *Himantopus himantopus*	Black winged stilt	M
42	**FAMILY-Rhipiduridae**		
	i) *Rhipidura albicoilis*	White throated fantail	R
	ii) *Amaurornis phoenicurus*	White breasted water hen	R
43	**FAMILY - Sturnidae**		
	i) *Pastor roseus*	Starling /Rosy pastor	LM
	ii) *Acridotheres tristis*	Indian myna	R
	iii) *Sturnia pagodarum*	Brahminy myna	R
44	**FAMILY- Strigidae**		
	i) *Athene brama*	Spotted owlet	R
45	**FAMILY-Scolopacidae**		
	i)*Tringa nebularia*	Common green shank	M
	ii) *Tringa glarerola*	Wood Sandpiper	M
	iii) *Actitis hypoleucos*	Common Sandpiper	R
46	**FAMILY - Threskiornithidae**		
	i)*Platalea leucorodia*	Eurasian spoonbill	LM
	ii)*Pseudibis papillosa*	Red naped ibis	R
47	**FAMILY- Tytonidae**		
	i) *Tyto alba*	Common Barn owl	R
48	**FAMILY-Upupidae**		
	i) *Upupa epops*	Common hoopoe	R
49	**FAMILY-Zosteropidae**		
	i) *Zosterops palpebrosus*	Oriental white eye	R

Discussions

This survey shows that there is wider range of major species in the Kuchi and Jakhapur Water Tank and its surrounding areas. There are four different types of birds identified such as Resident of local (R), Migrant (M), Endangered (E) and Local Migrant (LM). The percentage of – Resident - 0.67%, Migrant - 0.21%, Endangered - 0.03%, (*Mycteria leucocephala* -Painted stork is near threatened) and Local migrant - 0.07%. After going to the checklist it is very clear that both terrestrial (land) and aquatic birds from Kuchi, Jakhapur water tank and its surrounding were represents 49 Families, 84 Genera and 101 Species counted

as a rich Biodiversity. Some species are endangered and frequently visit to this region because of natural resources available in terms of shelter, food and breeding grounds.

Out of 101 species recorded in this study, the highest were insectivorous, followed by granivorous, nectarivorous, omnivorous, carnivores and frugivorous. About 40% birds were insectivorous, this might be due to the best adapter of this feeding guild to the human-modified agricultural area. A high abundance of granivores bird species also reported because of seasonal variation in food source where farmers plow farm land and annual crop species bloom during wet and rainy season. This proves that this region supports good number of birds because of availability of different food items, shelter, resting grounds as well as peaceful and protective land. It is obvious that resident and local migrant birds dominate the avifauna in this region. Particularly in the study area, the conservation value of agro forestry for avifauna has not been well documented. Most studies are limited to this study area.

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A Checklist of Spider Fauna (Arachnida: Araneae) of Sangli District (MS, India)

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Abstract: *The survey of spider was carried out from the Sangli District which is located in the western part of Maharashtra. Tehsils in Sangli District includes Atpadi, Jath , Kadegaon ,Kavathe Mahankal, Khanapur , Miraj ,Palus, Shirla, Tasgaon and Walwa . Sangli district has distinct kind of environment. Eastern talukas of Shirala, Walwa, Palus are famous for high rainfall with hills and slopes with some bushy plants, grass and trees. Total area of Sangli is 8.572 km².* **Chandoli** *National Park is established in Sangli district of Shirla Tehsil notable as the southern portion of the Sahyadri Tiger Reserve. This region shows good number of spiders during the month of September to December. This is because of availability of food and breeding ground. Sagareshwar Wildlife Sanctuary is a protected area in the Sangli district at the meeting of three Tehsils of Sangli district: Kadegaon, Walva and Palus. It is an artificially cultivated forest with an area of 10.87 km².This region also shows good number of spider diversity. During study we reported 32 spider families, 155 genera and 345 species during year 2012-2017, with a dominance of Araneidae, Salticidae and Lycosidae spiders.*

Keywords: Spider, Arachnida:Araneae, diversity, Sangli district

1. Introduction`

Spiders belong to class Arachnida, order Araneae of Phylum Arthropoda. They vary in size, shape and behavior. They comprise one of the largest orders of animals. The body of spider is divided into cephalothorax and abdomen with pedipalps and eight legs. They use the silk to wrap the prey, to hang from and to make egg sacs and nests (1867, 1968, 1975). The spider fauna of India has never been studied in its entirety despite of contributions by many arachnologists since Stoliczka (1869). The pioneering contribution on the taxonomy of Indian spiders is that of European arachnologist Stoliczka (1869). Review of available literature reveals that the earliest contribution by Blackwall (1867); Karsch (1873); Thorell (1895) and Pocock (1900) were the pioneer workers of Indian spiders. They described many species from India. Tikader (1980, 1982), Tikader, and Malhotra (1980a,b) described spiders from India. Tikader (1980) compiled a book on Thomisidae spiders of India, comprising two subfamilies, 25 genera and 115 species. Pocock (1900) and Tikader (1980, 1987) made major contributions to the Indian Arachnology, have high lightened spider studies to the notice of other researcher. Tikader (1987) also published the first comprehensive list of Indian spiders, which included 1067 species belonging to 249 genera in 43 families. From the last three decades, contribution of Gajbe (1995-2003) to the field of spiders is noteworthy. He described 147 new spider species from different habitats of India. He published 69 papers on Araneid, Gnaphosid, Lycosid, Thomisid and Oxyopid spiders and also State Fauna series (2007, 2008a, 2009). Platnick in his World Spider Catalog (2005) has estimated that, there are about 38000 species worldwide, arranged in 110 families. The updated spider checklist given by Keswani et al. (2012) of SGB Amravati University. According to world spider catalogue there are Spiders of protected areas in India, are studied by Gajbe (1995a) in Indravati Tiger Reserve and recorded 13 species. Rane and Singh (1977) recorded five species and Gajbe (1995b) 14 species from Kanha Tiger Reserve, Madhya Pradesh. Gajbe (2003) prepared a checklist of 186 species of spiders in 69 genera under 24 families distributed in Madhya Pradesh and Chhattisgarh. Patel (2003) described 91 species belonging to 53 genera from Parabikulum Wildlife Sanctuary, Kerala. Manju Silwal et al. (2003) recorded 116 species from 66 genera and 25 families of spiders from Puma wildlife Sanctuary, Dangs, Gujarat. Bastawade (2004) described arachnid fauna of orders Araneae, Scorpionida and Solifugi from Melghat Tiger Reserve, Amravati, Maharashtra State. John Celab (2020) documented the spider fauna in the vicinity of asuburban lake (Araabath Lake) in Chennaiwas. So far nobody has worked out or studied the spider fauna of Sangli district; therefore we are going to explore the diversity of spiders from this region.

2. Methods and Materials

A site wise distribution table was prepared for Sangli district. Sāngli district has a latitude of 16°51'8.63"N and a longitude of 74°34'53.32"E. Various places visited during year. For present study selected various places from each tehsils of Atpadi, Jath , Kadegaon ,Kavathe Mahankal, Khanapur , Miraj ,Palus, Shirla, Tasgaon and Walwa including Chandoli National Park. (Fig.1). The Taxonomic list of spiders was recorded during the period of 2012 to 2017. The survey was carried out every month of year. The habitat, behavior of spiders and movements and identification marks was studied. The techniques used for spider study was active visual search, litter sampling, grass sweep netting, pitfall trapping and tree beating The survey was made during early morning hours (6 hours to 9 hours) and day time (16 hours to 18 hours), from different parts of the microhabitats, like, rolled or folded leaves, plant branches, leaf litter, tree trunks, rock surface, grass blades, dry hay and grasses, moist places, under stones, pebbles, humus, bushes, on the bark and

branches of trees, water logged locations etc. The Lycosids and Gnaphosids were studied from the soil surface and also from the river beds. Each spider was identified mainly on the basis of morphological characteristics, epigyne and or palp structure by using the literature (Kaston, 1978; Barrion and Litsinger, 1995; Tikader, 1987, Levy and Amitai 1982, 1983 Levi and Randolph, 1975; Namkung et al., 2002; Perveen et al., 2012, and Mujumdar, 2007). The details of body parts of specimens were examined under a good quality stereo zoom microscope. The identification of species was carried out by the comparison of morphological features with the help of published literature, standard books and field guides.

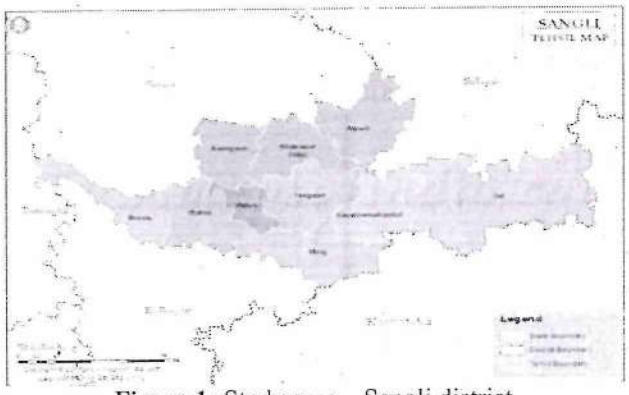

Figure 1: Study area – Sangli district

3. Observations and Results

The present study constitutes the spider species in various parts of Sangli district. The following taxonomic list was recorded which constitutes spiders representing 32 families, 155 genera and 345 species from study area of Sangli district. Araneidae was the dominant family constituting 61 species under 24 genera and followed by Salticidae with 45 species under 24 genera.

Checklist of spiders from sangli district

1. Family : Araneidae – Orb Web Spiders

1. Araneus mitifi cus (Simon 1886) Female
2. Araneus viridiventris (Yaginuma 1969)
3. Araneus nox (Simon 1877)
4. Araneus himalayaensis (Tikadar 1975)
5. Araneus ellipticus (Tikadar and Bal ,1981)
6. Arachnura sp. (New)
7. Argiope lobota (Pallas 1972)
8. Argiope aemula (Walckenaer 1841) Female
9. Argiope aemula (Thorell1857) Male
10. Argiope anasuja Female (Thorell 1857)
11. Argiope trifasciata (Forsskal 1975)
12. Argiop sp. argentata Silver argiope spider (Fabricius 1775)
13. Cryrtophora citricola (Forskal 1775)
14. Crytophora moluccensis (Doleschall 1859)
15. Chorizopes anjanes (Tikadar 1965)
16. Chorizopes bengalensis (Tikadar 1975)
17. Chorizopes khanjanes (Pocock 1965)
18. Cyrtarachne raniceps (Pocock 1900)
19. Cyclosa bifi da (Doleschall 1859) Female
20. Cyclosa hexatuberculata (Tikadar 1982) Female
21. Cyclosa confraga (Thorell 1892)
22. Cyclosa spirifera (Simon 1889)
23. Cyclosa moonduensis (Tikadar 1963)
24. Cyclosa insulans (Costa 1934)
25. Delfochus zelivira (Simon 1894)
26. Eriophora transmarine (Keyserling 1865)
27. Eriophora laglaisei (Simon 1877)
28. Eriovixia gryffi ndori (Ahmed, Khalap and Sumukha 2016)
29. Eriovixia sp. (New)
30. Gasteracantha hasselti (C. L. Koch 1837)
31. Gasteracantha geminata (Fabricius 1798) Female
32. Gasteracantha kuhli (C. L. Koch 1837) Female
33. Gasteracantha dalyi (Pocock 1900)
34. Gasteracantha remifera (Butler 1873)
35. Gea subarmada Female (C. L. Koch 1843)
36. Telecantha brevispina (Doleschall 1856) Female
37. Larinia chloris (Audouin 1826)
38. Larinia emertoni (Gajbe and gajbe 2004)
39. Lipocrea fusiformis (Thorell 1877)
40. Larinioides cornutus (Clerck 1757)
41. Larinioides sp. (Clerck)
42. Neoscona domiciliorum (Hentz 1847)
43. Neoscona punctigera (Doleschall 1857)
44. Neoscona subfusca (Walckenaer 1841)
45. Neoscona mukerjei (Tikader 1980) Female
46. Neoscona bengalensis (Tikadar and Bal 1981)
47. Neoscona nautical (L.Koch 1875)
48. Neoscona parambikulamensis (Patel 2003)
49. Neoscona bengalensis (Tikader and Bal 1981)
50. Neoscona crucifera (Lucas 1839)
51. Neoscona theisi (Walckenaer 1842)
52. Neoscona vigilans (Blackwell 1865)
53. Nephila pilipes (Fabricius 1993)
54. Nephila khulii (Tikader 1982)
55. Herennia multipunctata (Doleschall 1859)
56. Pasilobus kotigeharus Female (Tikader 1963)
57. Parawixia dehaani (Doleschall 1859)
58. Polytes columnaris (C. L. Koch 1843)
59. Poltys illepidus (C. L. Koch 1843)
60. Poltys nagpurensis (Tikadar 1982)
61. Zygiella indica (Tikadar and Bal 1980)

2. Family: Barychelidae - Brush-footed trapdoors

62. Tigidia rutilofronis (Simon 1889)

3. Family: Clubionidae - Sac Spiders

63. Clubiona iridula (Hirotsugu Ono 1989)
64. Clubiona bengalensis (Biswas 1984)
65. Clubiona tikaderi (Mujumdar and Tikadar 1991)

4. Family: Corinnidae – Ant Mimicking Sac Spiders

66. Castianeira zetes (Simon 1897) Female
67. Castianeira bengalensis (Biswas 1984)
68. Castianeira himalayansis (Gravely 1931)
69. Castianeira fl avipes (Gravely 1931)
70. Coenoptychus pulcher (Simon 1885)
71. Trachelas oreolhilus (Simon 1906)
72. Gastianeira longipalpa (Hentz 1847)
73. Graptartia granulose (Karsch 1880)

5. Family: Dipluridae – Curtain Web Spiders

74. Chilobrachys assamensis (Karsch 1892)
75. Euagrus diplurid Funnel Web Mygalomorph (Ausserer 1875)

76. Indithele sp.
77. Plesiophrictus sp.
78. Tigidae rutilofronis

6. Family: Dictynidae – Mesh Web Spider
79. Dictyna sp. (Simon, 1905)
80. Nigma puella

7. Family: Eresidae – Social Spiders
81. Stegodyphus sarasinorum (Karsch, 1891) Female
82. Stegodyphus tibialis (O. P. Cambridges 1869)

8. Family: Filistatidae – Crevice Weavers
83. Pritha insularis (Thorell 1891)

9. Family: Gnaphosidae – Ground Spiders/Mouse Spiders
84. Drassodes sitjbe (Tikadar and Gajbe 1975)
85. Drassodes deoprayagensis (Tikadar and Gajbe 1975)
86. Drassodes tikaderi (Gajbe 1987)
87. Drassodes villosus (Thorell 1856)
88. Drassodes viveki (Gajbe 1992)
89. Drassodes cupresus (Blackwell 1834)
90. Drassodes sp. (Westring 1851)
91. Gnaphosa poonaensis (Tikadar 1973)
92. Haplodrassus sp. (Emerton 1909)
93. Poecilochroa harmani (Tikadar 1982)
94. Scotophaesis bharatae (Gajbe 1989)
95. Scotophaeus blackwalli (Thorell 1871)
96. Sergiolus montanus (Emerton 1890)
97. Zelotes nasikensis (Tikadar and Gajbe 1976)
98. Zelotes poonaensis (Tikadar 1982)
99. Zelotes naliniae (Tikadar and Gajbe 1979)

10. Family: Hexathelidae – Tunnel Web Spider
100. Hexathele sp. (Simon 1892)

11. Family; Hersiliidae – Two Tailed Spiders/Bark Spiders
101. Hersilia Savignyi (Lucas 1836) Female
102. Hersilia tibialis (Baehr and Baehr 1993)

12. Family: Idiopidae – Trapdoor Spiders
103. Heligmomerus barkudensis Idiops (Simon 1889)
104. Idiops rubrolimbatus (Mirza & Sanap 2012)

13. Family: Lycosidae – Wolf Spiders
105. Arctosa indica (Tikadar and Malhotra 1980)
106. Arctosa mulani (Dyal 1935)
107. Evippa baneraensis (Tikadar and Malhotra 1980)
108. Evippa mandlaensis (Gajbe 2004)
109. Evippa shivajii (Tikadar and Malhotra 1980)
110. Geolycosa curli (Reimoser 1934)
111. Hippasa agelenoides (Simon 1884)
112. Hippasa greenalliae (Blackwell 1867)
113. Hippasa hansae (Gajbe and Gajbe 1999)
114. Hippasa holmerae (Thorell 1895)
115. Hippasa loundesi (Gravely 1924)
116. Hippasa madhuae (Tikadar and Malhotra 1980)
117. Hanga stictopyga (Thorell 1895)
118. Lycosa balaranai (Patel and Reddy 1993)
119. Lycosa bhatnagari (Sadana 1969)
120. Lycosa fuscana (Pocock 1901)
121. Lycosa geotubalis (Tikadar and Malhotra 1980)
122. Lycosa praegrandis (C. L. Koch 1836)
123. Lycosa poonaensis (Tikadar and Malhotra 1980)
124. Lycosa thoracica (Patel and Reddy 1993)
125. Lycosa mackenziei (Gravely 1924)
126. Pardosa birmanica (Simon 1884)
127. Pardosa leucopalpis (Gravely 1924)
128. Pardosa partita (Simon 1885)
129. Pardosa ranjani (Gajbe 2004)
130. Pardosa subhadrae(and Rrddy 1993)
131. Pardosa milvina (Hentz 1844)
132. Trochosa gunturifera (Gravely 1924)
133. Wadicosa quadrifera (Gravely 1924)
134. Zoica puellula (Simon 1898)

14. Family: Miturgidae – Dark Sac Spiders
135. Argoctenus sp. (L. Koch, 1878)
136. Cheiracanthium danieli (Tikader 1975) Female
137. Cheiracanthium indicum (O. P. Cambridge 1874)
138. Cheiracanthium inclusum (Hentz 1847)
139. Cheiracanthium melanostomum (Thorell 1895)
140. Cheiracanthium erraticum (Walckenaer 1802)
141. Cheiracanthium oncognathum (Thorell 1871)
142. Miturga sp. (Thorell)

15. Family: Oonopidae – Dwarf Hunting Spiders
143. Opopaea indica sp. Female (Simon 1890)

16. Family : Oecobiidæ - Disc Web Spiders
144. Uroctea durandi (Lucas 1846)
145. Oecobius annulipes (Lucas 1846)

17. Family: Oxyopidae – Lynx Spiders
146. Hamataliwa sp. (Keyserling 1887)
147. Hamadruas sp. (Thorell 1887)
148. Hamadruas sp. (New) (Thorell 1887)
149. Oxyopes javanus (Thorell 1887) Female
150. Oxyopes chittrae (Tikader 1965) Female
151. Oxyopes bharatae (Gajbe 1999)
152. Oxyopes biramanicus (Thorell 1887)
153. Oxyopes indicus (Walekenaer 1805)
154. Oxyopes kamalae (Gajbe 1999 Gajbe and Gajbe 1999)
155. Oxyopes ketani (Gajbe and Gajbe 1999)
156. Oxyopes pankaj (Gajbe and Gajbe 2001)
157. Oxyopes shweta (Tikadar 1970)
158. Oxyopes sameeri Female
159. Oxyopes tikaderi (Biswas and Majumdar 1995)
160. Oxyopes sweta (Tikader 1970)
161. Oxyopes quadrifasciatus (Latreille 1804)
162. Peucetia elegans (Blackwell 1864)
163. Peucetia viridians (Stoliczka 1869)

18. Family: Philodromidae – Running Crab Spiders
164. Philodromus barman (Tikadar 1980)
165. Philodromus pali (Gajbe 2000)
166. Tmarus angulatus (Walckenaer 1837)
167. Tibellus oblongus (Tikadar 1960)
168. Tibellus sp. (Tikadar 1960)
169. Tibellus elongates (Tikadar 1960)
170. Tibellus poonaensis (Tikadar 1962)
171. Tibellus vitilis (Simon 1906)
172. Thanatus ketani (Bhandari and Gajbe 2001)
173. Thanatus dhakuricus (Tikadar 1960)

174. Thanatus indicus (Simon 1885)

19. Family: Pholcidae – Daddy Long Leg Spiders/Cellar Spiders
175. Artema atlanta (Walckenaer 1837)
176. Grossopriza lyani (Blackwell 1867)
177. Pholcus phalangioides (Artema Fuesslin 1775)
178. Smeringopus pallidus (Blackwell 1858)
179. Physocyclus globusus (Taczanowski 1874)

20. Family: Pisauridae – Nursery Web Spiders
180. Dendrolycosa gracilis (Thorell 1981)
181. Dolomedes tenebrosus (Hentz 1844)
182. Dolomedes plantarius (Clerck 1757)
183. Pisaura gitae (Tikadar 1970) Female
184. Pisaura putiana (Barrion and litsinger 1995)
185. Nilus marginatus (Simon 1888)
186. Thalassius albocinctus (Doleschall 1859)
187. Thaumasia velox (Simon 1898)

21. Family : Psechridae - Jungle Cribellate Spiders
188. Psechrus sp. (Pocock 1899)

22. Family : Salticidae – Jumping Spiders
189. Aelurillus quadrimaculatus (Simon 1889)
190. Asemonea tenuipes O. P. (Cambridge 1869)
191. Bianor angulosus (Karsch 1879)
192. Cosmophasis miniaceomicans (Simon 1888)
193. Epeus albus (Proszynski 1992)
194. Epeus fl avobilineatus (Doleschall 1859)
195. Epocilla aurentiaca sp. (Simon 1885)
196. Hasarius adansoni (Audouin 1826)
197. Hyllus semicupreus (Simon 1885)
198. Harmochirus insulanus (Simon 1885)
199. Ligura latidens (Simon,1903)
200. Lyssomanes sp. (Hentz 1845)
201. Mopsus penicillatus (Karch 1878)
202. Marpissa tigrina (Tikadar 1965)
203. Marpissa muscosa (Clerck 1757)
204. Marpissa singhi (Monga, Singh and Sadana 1989)
205. Menemerus bivittatus (Dufour 1831)
206. Myrmarachne incerta (Narayan 1915)
207. Myrmarachne jajpurensis (Proszynski 1992)
208. Myrmarachne Maratha (Tikadar 1973)
209. Myrmarachne orientalis (Tikadar 1973)
210. Myrmarachne plataleoides (O. P. Cambridge 1869)
211. Myrmarachne providens (Peckham and Peckham 1892)
212. Myrmarachne satarensis (Narayan 1915)
213. Myrmarachne uniseriata (Narayan 1915)
214. Phintella vittata (C. L. Koch 1846)
215. Phintella versicolor (C. L. Koch 1846)
216. Plexippus paykulli (Savingyny and Audouin 1825)
217. Plexippus petersi Female (Karsch 1878)
218. Paraphidippus aurantius (Lucas 1833)
219. Portia fi mbriata (Doleschall 1859)
220. Portia labiata (Thorell 1887)
221. Portia sp. (New)
222. Rhene danieli (Tikadar 1973)
223. Rhene decorate (Tikadar 1977)
224. Rhene fl avicomans (Simon 1902)
225. Rhene haldanei (Gajbe 2004)
226. Rhene indica (Tikadar 1973)
227. Rhene danieli Female Tikader 1973
228. Rhene fl avigera (Tikader 1873)
229. Telamonia dimidiata (simon 1899) Female
230. Telamonia peckhami (Thorell 1891)
231. Tellamonia festiva (Thorell 1887)
232. Thiania bhamoensis Female (Thorell 1887)
233. Thyene imperialis (Rossi 1846)
234. Zygoballus pashanensis (Tikadar 1975)

23. Family : Scytodidae – Spitting Spiders
235. Scytodes allfredi (Gajbe 2004)
236. Scytodes fusca (Walckenaer 1837)
237. Scytodes pallidae (Doleschall 1859)
238. Scytodes thoracica (Latreille 1802)

24. Family : Sicariidae – Violin Spiders
239. Loxosceles rufescens (Dufour 1820)
240. Sicarius sp. (Walckenaer 1847)

25. Family : Sparassidae – Giant Crab Spiders
241. Heteropoda kandiana (Pocock 1899) Female
242. Heteropoda venatoria (Linnaeus 1767)
243. Heteropoda maxima (Latreille 1804)
244. Olios millet (Pocock 1901)
245. Olios iranii (Pocock 1901)
246. Olios lamarcki (Latreille 1806)
247. Olios giganteus (Keyserling 1884)
248. Olios correvoni (Lessert 1921)
249. Olios argelasius (Walckenaer1805)

26. Family : Tetragnathidae - Long-jawed orb weavers
250. Leucauge decorate (Blackwall 1864) Female
251. Tetragnatha mandibulata (Walckenaer 1841) (Male and Female)
252. Tetragnatha javanus (Thorell 1890)
253. Tetragnatha viridorufa (Gravely 1921)
254. Tetragnatha Montana (Simon 1874)
255. Opadometa fastigata (Simon 1877) Female

27. Family : Theridiidae – Comb Footed Spiders/Cob Web Spiders
256. Achaearanae mundulum (L. Koch 1872)
257. Achaearanae triangularis (Patel 2005)
258. Achaearanea durgae (Tikader 1970)
259. Achaearanea tepidariorum (C. L. Koch 1841)
260. Argyrodes elevates (Taczanowski 1873)
261. Argyrodes fl agellum (Doleschall 1857)
262. Argyrodes jamkhedes (Tikadar, 1963)
263. Argyrodes rainbow (Rainbow W. J. 1920)
264. Argyrodes sp. (Simon 1864)
265. Ariamnes sp. (New) (Thorell 1869)
266. Ariamnes pavesii (Leardi 1902)
267. Chrysso picturata (Simon 1895)
268. Chrysso argyrodiformis Female (Yaginuma 1952)
279. Chrysso pulcherrima (Mella Loitao 1917)
270. Euryopis sp (Keyserling 1890)
271. Euryopsis flvomaculata (C. L. Koch 1836)
272. Euryopis episinoides (Walckenaer 1847)
273. Euryopsis flavomaculata (C. L. Koch 1836)
274. Latrodectus hasselti (Thorell 1870)
275. Phycosoma sp. (Cambridge 1879)
276. Phorodectus testudo (O. P. Cambridge 1873)
277. Propostira quadraangulata (Simon 1894)
278. Rhomphaea projiciens (O. P. Cambridge 1896)

279. Rhomphaea nasica (Simon 1873)
280. Steatoda rufoannulata (Somon 1899)
281. Steatoda bipunctata (False black widow spider) (Linnaeus 1758)
282. Theridion incertum (O. P. Cambridge 1885)
283. Theridion spinosissimum (Caporiacco 1934)
284. Theridion tikaderi (Patel 1973)
285. Theredion angula (Tikader 1970)
286. Theridion pyramidale (L. Koch 1867)
287. Theridion mundula Female (L. Koch 1872)
288. Thwaitesia sp. (Simon 1892)

28. Family : Theridiosomatidae – Ray spider
289. Theridisoma sp.

29. Family : Thomisidae – Crab Spiders/Flower Spiders
290. Amyciaea forticeps (O. P. Cambridge 1887)
291. Camaricus bipunctatus (Bastawade 2002)
292. Camaricus formosus (Thorell 1887)
293. Camaricus maugei (Thorell 1887)
294. Diaea bengalensis (Biswas and Majumdar 1981)
295. Diaca puncta (Thorell 1869)
296. Diaca dorata (Fabricius 1777)
297. Ebrechtella tricuspidata (Fabricius 1775)
298. Misumena vatia (Clerck 1757)
299. Misumena greenae (Tikadar 1965)
300. Misumena indra (Tikadar 1963)
301. Misumenops khandalaensis (Tikadar 1965)
302. Otylate elongate (Tikadar 1980)
303. Otylate virens (L. Koch 1878)
304. Ozyptila chandosiensis (Tikadar 1980)
305. Ozyptilia Maratha (Tikadar 1971)
306. Runcinia khandari (Gajbe 2004)
307. Runcinia pooneus (Tikadar 1965)
308. Runcinia affi nis (Simon 1897)
309. Strigoplus molur (Patel 2003)
310. Thomisus granulifrons (Simon 1906)
311. Thomisus pathaki (Gajbe 2004)
312. Thomisus pooneus (Tikadar 1965)
313. Thomisus viveki (Gajbe 2004)
314. Thomisus anustus (Walckenaer 1805)
315. Tmarus rimosus (Paik 1973)
316. Tmarus jabalpurensis (Gajbe and Gajbe 1999)
317. Tmarus kotigeharus (Tikadar 1963)
318. Xysticus bharatae (Gajbe and Gajbe 1999)
319. Xysticus breviceps (O. P. Cambridge 1885)
320. Xysticus robustus (Hahn 1832)
321. Xysticus khasiensis (Tikadar 1980)
322. Xysticus tikaderi (Bhandari and Gajbe 2001)
323. Indixysticus mimutus (Tikader1960)

30. Family : Theraphosidae – Mygalomorphs - Tarantula
324. Haploclastus sp. (Simon 1892)
325. Thrigmopoeus insignis (Pocock 1899)
326. Chilobrachys fi mbriatus (Pocock 1899)
327. Chilobrachys hardwickii (Pocock 1985)
328. Poecilotheria regalis (Pocock 1899)

31. Family : Uloboridae - Cribellate Orb Weavers
329. Miagrammopes indicus (Tikadar 1971)
330. Miagrammopes poonaensis (Tikadar 1971)
331. Miagrammopes sp. (Tikadar 1971)
332. Miagrammopes sp. (Tikadar 1971)
333. Miagrammopes sp. (New)
334. Miagrammopes sp. (Akerman, C. 1932)
335. Uloborus khasiensis (Tikadar 1969)
336. Uloborus krishnae (Tikadar 1970)
337. Uloborus plumipes (Thorell 1869)
338. Uloborus variabilis (Keyserling1986)
339. Zosis geniculata (Oliver 1789)

32. Family : Zodariidae – Ant Hunting Spiders
340. Zodarion styliferum (Simon 1870)
341. Zodarian italicum (Canestrini 1868)
342. Storosa obscura (Jacque 1991)
343. Asceua cingulata (Simon1905)
344. Lutica bengalensis (Tikadar and Patel 1975)
345. Lutica deccanensis (Tikadar and Malhotra 1976)

4. Discussion

Considering the duration of the current study and the large number of specimens in the study provides a good representation of spider families occurring in the Sangli district. The abundance of grasses like; *Andropogon pumilus, Aristida adscensionis, Brachiaria eruciformis, Chrysopogon fulvus, Cyperus rotundus, Dactyloctenium aegyptium, Digitaria ciliaris, Dinebra retroflexa, Lephopogon tridentatus* etc. are favourable for spiders from family Oxyopidae and philodromidae. During study of year 2012 to 2017 we reported that 32 spider families with 155 genera and 345 species from Sangli district including Chandoli National Park (Sahyadri Tiger Reserve) which provides wonderful vistas of the surrounding landscape. The most distinct feature of this national park is the presence of numerous barons rocky and laetrile plateau called as Zolambi Sada. This platue is good source of lycosidae and thomisidae spiders. Additionally the study provided new information on the distribution of all species concerned and provides material that can be used in future taxonomic work.

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मध्य भारती

मानविकी एवं समाजविज्ञान की शोध-पत्रिका

SOCIO-ECONOMIC AND HEALTH STATUS OF FEMALE TRIBAL SEASONAL WORKERS OF SURGANA TEHSIL OF NASIK DISTRICT, MAHARASHTRA

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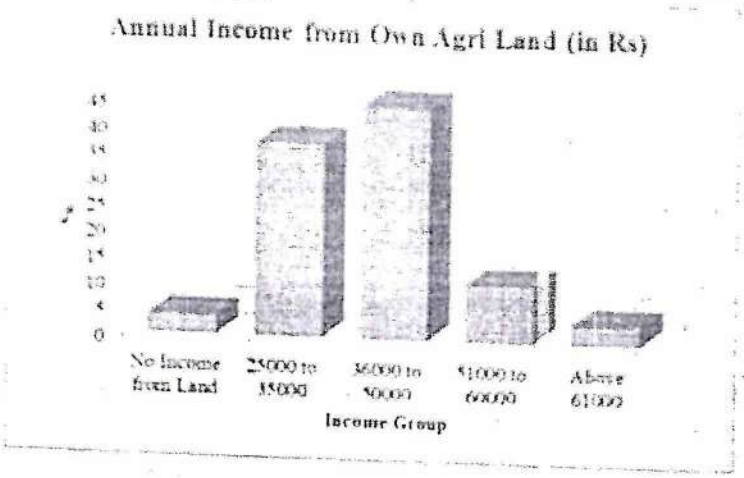
Abstract:

The prime purpose of this study is to reveal the socio-economic characteristics and health conditions of tribal females workers of Surgana tehsil of Nasik district who seasonally migrate from native places to the other tehsils i.e., Niphad, Dindori, Chandwad etc. within the district as a labour in the agricultural fields. This study is purely based on primary data sources. SPSS and Microsoft Excel have been incorporated for data analysis (Correlation and Percentage method). After analyzing the data it was found that the pivotal reason of the seasonal migration are mainly the seasonal job nature, under employment in agriculture and financial crisis at their native place that becomes the push factors for their movement to other tehsils. It has been observed that their wages are low and that they are suffering from many health problems while working in the grape orchards. Causes behind the health problems are mainly pesticide sprays and sunstroke. It is the need of the hour that the government should come up with the proper policy for their betterment and progress.

Key Words: Seasonal migration, Low wages, Pesticides.

Introduction

Migration is a multifaceted and intricate phenomenon. A combination of economic and social incentives, political instability, and conflict often drives those who move from one place to another. Other significant factors may include family reunification, the pursuit of better education, the impact of natural disasters and climate change, and a lack of viable opportunities to sustain their livelihoods in their current location (FAO, 2018). One of the primary ways tribal communities have dealt with the absence of employment prospects in their home regions is through migration (Borhade, Anjali & Dey, 2020). In 2011, the census of India identified 52.4 million males and 51.9 million females as members of 705 ethnic groups classified as Scheduled Tribes (ST) according to the constitution. The majority of the Scheduled Tribe community is clustered in the central region of India, which includes forests and plateau areas spanning across nine states: Odisha, Madhya Pradesh, Chhattisgarh, Jharkhand, Maharashtra etc. (NSSO) (2011-12). The proportion of rural Adivasi households without land is increasing, resulting in a decline in the number of Adivasi households engaged in farming activities. This suggests that many Adivasi communities are becoming more dependent on wage labour, indicating a trend towards proletarianization. In rural Adivasi households, a more significant percentage of households rely on wage labour as their primary Source of income compared to those who depend primarily on farming activities. Despite receiving lower wages, Adivasi women exhibit a higher work participation rate than women from other social groups. A significant percentage of Adivasi laborers are temporary migrants. The difference in earnings between Adivasi women and women from other social groups was smaller than the difference in earnings between Adivasi men and men from other social groups. This suggests that women, regardless of social category, are generally exploited in the workforce —(Karat & Rawal, 2012). Thus, the sole purpose of this study is to reveal the socio-economic characteristics of the seasonal female tribal workers of Nasik district who migrate who prefer the intra-tehsil migration within the district as a labour in the agricultural fields to earn a means of livelihood.



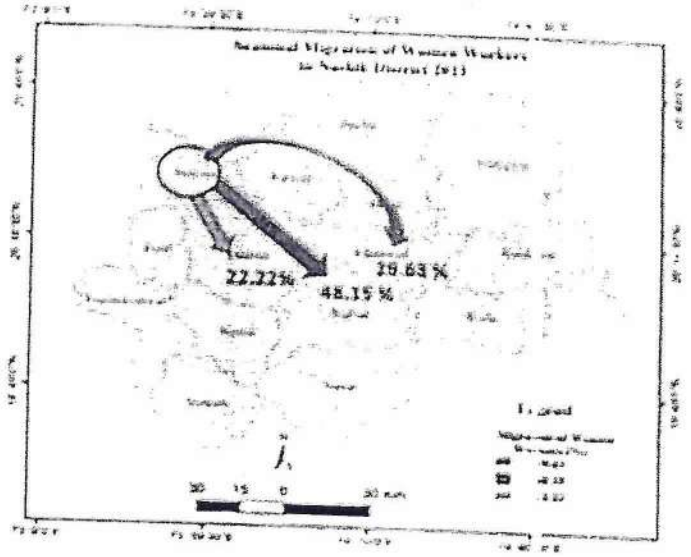
Graph shows the annual income from the own agricultural lands in Rs.

The above graph show that 3.70 % of families have no income from their farmlands. Only their subsistence needs full fills. 37. 04 percent of families have an annual income of 25000 to 35000 RS. annually. 44.44 families have 36000 to 50000 RS. annually. 11.11 families have an annual income of Rs. 51000 to 60000. There are a very meagre number of families who have an annual income of above 61000 Rs.

VI) Causes of Seasonal Migration of Tribal Women Workers:

People migrate to distant places because of both pull and push factors -""(Haas, 2021). The 77.78 percent of respondents claimed that they migrate to other places because of the seasonal nature of job opportunities and 11.11 percent said due to financial problems. About 11.11 respondents revealed the other reasons for their migration. It was the unanimous view of all respondents that the under employment in the agricultural sector at their place of origin is the main reason for their migration to other places.

VII) Preferences to Work in the Grapes field:



Conclusion

The correlation matrix shows that there is moderately low association (r = 0.443*) between education status and percentages of individual income share in their family, the p value (0.021) is less than level of significance (0.05), it means correlation between educational status and percentages of individual income share in their family is statistically significant at 0.05 level. It reveals that percentage of share of income of women in the family is determined by their level of education.

In relation to association between annual income of entire family and percentages of individual women income share in their family is given in table 15. It shows that the correlation is -864** and p value is 0.001 at 0.01 level of significance. It means there is strong negative association between the annual income of entire family and percentages of individual women income share in their family. It reveals that there is inverse association between family income and individual women income in the study area.

Suggestion

- There should be proper industrial and agricultural development in all the tehsils of the study area so that every person finds a variety of job opportunities at their native places.
- There should be a proper increase in the wages of these seasonal workers.
- At the migrated farm fields, there should be proper accessibility to the clean drinking water.
- Protection measures in the form of goggles, gloves, masks and waterproof coats should be provided at free of cost to these seasonal labors so that they protect themselves from the toxic pesticides.
- Proper medical facilities should be provided to them at free of cost
- There should be the proper facilities for their dwelling and sleeping in the vicinity of migrate farm fields.
- Sanitary facilities in the form of toilets should be implemented at the farm fields to prevent open defecation.

Conclusion:

This study has tried to know the socio-economic and health condition of the female tribal seasonal workers of the Surgana tehsil who migrates as agricultural labors to other tehsils within the Nasik district. The important summaries of this study are briefly discussed as:

- Mainly the female workers who falls in age group of 31 to 51 are mobile.
- 40.74 percent of workers have studied up to 10th-12th standards.
- There are 12 respondent families who have family size of 5 to 6 members.
- Only 02 respondent families have 7 to 12 acres of land and rest 25 respondents have less than 7 acres of land.
- There are only 03 families who have the annual income of 51000 to 60000 Rs. from their farm fields. Other respondent families are either land less or have an annual income of less than 51000 Rs generated from their croplands.
- 77.77 respondents have claimed that the Seasonal Nature of Job opportunities and financial problems are the two main reasons for the seasonal migration to other places.
- 48. 15 percent of respondent workers of Surgana tehsil mainly prefers to migrate to Niphad tehsil to work in the grape fields.
- In the year 2022-23, 70.37% percent respondent workers have worked in the grape's fields from 51 to 60 days.
- Only 18.52 % of our surveyed population has the wages above 350 Rs. Per person per day. The rest of the respondent population gets below 350 Rs. / person/day.
- 77.78 percent of respondents claimed that the main reason behind the health problems that are emerged while working in the grape farms is the pesticide sprays. Another reason they mentioned is sunstroke.
- All the 27 respondents are suffering from headache. 96.30 percent respondents are facing skin problems. The other common diseases they face while working in the grape fields are eye irritation, dehydration etc.

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मराठी साहित्य प्रवाहांमधून व्यक्त होणारे समतामूल्य : एक शोध

(Special Issue No.125)

Chief Editor

Dr. Pramod P. Tandale

Editor

Dr. Anil Prabhakar Ubale

अण्णा भाऊ साठे यांच्या कादंबरीतील समतामूल्य

प्रा.डॉ.मोहन लोंढे
पद्मभूषण वसंतरावदादा पाटील महाविद्यालय
कवठेमहांकाळ, ता. कवठेमहांकाळ, जि.सांगली

प्रस्तावना :

भारतीय संविधानाचे मुलभूत सूत्र 'समता' हेच आहे. पिढ्यानपिढ्या गुलामासारखी वागणूक मिळालेल्या लोकांना संविधानाने ताठ मानेने माणूस म्हणून जगण्याचा हक्क बहाल केला. सर्वच लोकांना समतेच्या विचाराने व कायद्याने एकत्र बांधले आहे. असे असले तरी ज्या काळात उच्चवर्णीय समाजाला काही विशिष्ट लोकांची सावली व स्पर्श सुद्धा निषिद्ध होता,त्या काळात आपल्या सत्तेने समता प्रस्थापीत करू पाहणारे छत्रपती शाहू महाराज, कृतीने महात्मा जोतिराव फुले, विचाराने डॉ. बाबासाहेब आंबेडकर व साहित्यातून अण्णा भाऊ साठे यांनी समाजाला समतेचे अधिष्ठान देण्याचे मोलाचे कार्य केले. डॉ.बाबासाहेब आंबेडकरांच्या प्रेरणेने शिक्षण घेवून आपले स्वत:चे अस्तित्व निर्माण करु पाहणारे अनेक तरूण डॉ.बाबासाहेब आंबेडकरांचा वैचारिक वारसा जपत होते त्यातून स्वत:ला आलेले अनुभव कागदावर उतरवत होते. समता, स्वातंत्र्य, बंधुता या मुल्यांचा आग्रह धरत होते. चातुर्वण्य व्यवस्थेने माणसामाणसांत केलेला भेद नाकारत होते. त्यातूनच विसाव्या शतकामध्ये राजा ढाले, चंद्रकांत पाटील, अशोक शहाणे, शंकरराव खरात, बंधू माधव, बाबुराव बागुल यांच्यासारखे शेकडो लेखक उदयास आले. या सर्वांच्या आसपास तत्कालीन विषमतावादी विचारसरणीला नाकारत सामाताधिष्ठीत समाजाच्या रचनेचे स्वप्न पाहिले. त्यातूनच सामतामूल्याचा विचार प्रमाण होवून सामाजिक समानतेचा विचार अधिक प्रबळ व दृढ झाल्याचे दिसते.

व्याख्या :'सर्व मानव जन्मत: समान आहेत त्याना समान संधी व अधिकार मिळाला पाहिजे.ही संकल्पना म्हणजे समता होय'. - मराठी विश्वकोश

साहित्य आणि समाज अनुबंध :-

साहित्य हा समाजाचा आरसा मानला जातो. कारण मुळात साहित्याचे बीज हे सामाजिक भूमीतच रुजते, फुलते आणि बहरते सुध्दा. म्हणूनच समकालीन साहित्यावर सामाजिक प्रभाव आणि भल्याबु-या गोष्टींचा विशेष परिणाम जाणवतो. वेगवेगळे विषय, प्रसंग, व्यक्ती आणि प्रवृत्ती घेऊन साहित्याची वाटचाल ही संस्कृतीदर्शी झाल्याचे दिसून येते. मुलत:साहित्यिक हा समाजात राहत असतो. त्यामुळे सामाजिक चालीरीती, श्रद्धा, संस्कृती इत्यादी बाबींचे चित्रण साहित्यामध्ये येणे हे स्वाभाविकच. कथा, कविता, कादंबरी, वैचारिक, जलसे, आत्मकथन इ. साहित्य प्रकारामध्ये समाज चित्रण व तत्कालीन समाजातील सामाजिक बारकावे आपणास पहावयास मिळतात. करमणूकप्रधान, चरित्रात्मक, सामजिक, राजकीय अशा विविध पातळ्यावर आविष्कृत होणाऱ्या साहित्यातून सामाजिक, कौटुबिंक शैक्षणिक व मानवी मुल्यांची अभिव्यक्ती होताना पाहवयास मिळते.

वस्तुत: साहित्य आणि समाज यांचा संबध अन्योन्य असा आहे. साहित्यनिर्मिती आणि साहित्य व्यवहारातील एक स्थिर घटक म्हणजे समाज होय. कारण कोणत्याही साहित्याचा अनुबंध हा त्या त्या समाजाशी असतो.कारण साहित्य हे मानवी मनाचे व बुद्धीचे फलित मानले जाते. समाजसापेक्ष व्यक्तिमत्वाच्या मंथनातूनच साहित्य आविष्कृत होत असते. म्हणूनच साहित्य हे समाजाशी एकरूप होत समाजात रुजलेले असते. त्यामुळे समकालीन सामाजिक परिस्थितीचे चित्र साहित्यामध्ये उमटलेले दिसते. म्हणूनच साहित्य ही एक सामाजिक संस्था मानून 'अण्णाभाऊ साठे यांच्या कादंबरीतील समतामुल्य' या शोधनिबंधांच्या मूल्यात्मक, परिसीमांचा परामर्श घेण्याचा प्रयत्न केला आहे. समाजातील काही एका वेगळ्या परिस्थितीचा विचार केल्यास काळ, प्रसंग व परिस्थितीपरत्वे साहित्याचे नवे आकृतीबंध रूढ होत असतात.

स्वातंत्र्यपूर्व कालखंडात चातुर्वर्ण्य व्यवस्थेने जातीची मुळे इतकी खोल व घट्ट रुजविली होती की, त्यामुळे माणसाला माणूस असूनही माणसांसारखे राहण्याची मुभा नव्हती. त्या काळातील मानवी अमानुषतेच्या विविध अनुभवांना अनुभविलेल्या लोकांनी समतेचे महत्त्व जाणले

होते. हीच सामाजिक परिस्थिती अपरिहार्यपणे साहित्यामध्ये चित्रित झाली आहे.

आंबेडकरी विचारधारा आणि अण्णा भाऊ साठे :

महाराष्ट्रातील व पर्यायाने संपूर्ण भारतातील आंबेडकरपूर्व सामाजिक परिस्थितीचा विचार करता विषमतावादी विचारसरणीची अधिसत्ता बहुतांश लोकांच्या मनावर असल्याचे दिसून येते. कारण शेकडो वर्षे दारिद्र्य, अंधश्रद्धा, दैववाद व अज्ञान यामुळे तुकारामांच्या 'ठेविले अनंते तैसेचि रहावे' या उक्तीप्रमाणे आपले आयुष्य कंठणारे लोक होते. कोणत्याही प्रकारचे सामाजिक अधिकार व हक्क नसलेल्या, वर्णव्यवस्थेचे बळी ठरलेल्या जातीमध्ये जन्माला आलेल्या डॉ. बाबासाहेब आंबेडकरांच्या कार्याला व विचारांना बाजूला ठेवून अण्णा भाऊ साठे यांच्या वाङ्मयीन कार्याचा आढावा घेणे अशक्य आहे. सुरुवातीच्या कालखंडापासूनच भारतीय समाजव्यवस्थेमध्ये वर्ण व्यवस्थेची उतरंड दिसून येते. परिणामी अस्पृश्यता, जातीव्यवस्था, गरीब-श्रीमंत, श्रेष्ठ – कनिष्ठ असा भेदभाव होता. अशा कालखंडामध्ये डॉ. बाबासाहेब आंबेडकरांनी समतामुलक दृष्टीने जगाकडे पाहत शिक्षणाचा वापर शस्त्राप्रमाणे केला.त्यातून प्रेरणा घेतलेले अनेक तरुण समतातत्वाचा आग्रह करत लिहू लागले. अण्णा भाऊ साठे हे सुध्दा त्यापैकीच एक. फरक केवळ इतकाच की, अनौपचारिक शिक्षण घेऊन आंबेडकरी विचारधारा समाजातील तळागाळातील सर्वसामान्य लोकांना नायकत्व बहाल करून मानवतावाद, ध्येयवाद, समता, नैतिकता, आंबेडकरवाद, परिवर्तनवाद, मार्क्सवाद अशा अनेक मुल्यांची पायाभरणी करत प्रबोधनाच्या पातळीवर लोकांपुढे साहित्याच्या रूपाने ठेवणारे महान लेखक म्हणजे अण्णा भाऊ साठे होत.

अण्णा भाऊ साठे यांच्या कादंबरीतील समतामूल्य :

वास्तविक पाहता अण्णाभाऊ साठे यांचे साहित्य आणि त्यांचे जीवन यामध्ये फरकच नाही. अण्णाभाऊंचे लेखन हे निव्वळ समतेसाठीच होते. कथा, कादंबरी, प्रवासवर्णन, लोकनाट्य, पोवाडा, कविता अशा विविध वाडमय प्रकारामध्ये लेखन करणाऱ्या अण्णा भाऊ साठे यांचा कादंबरीच्या प्रातांतील प्रवास 'वारणेच्या खोऱ्या' पासून सुरु होवून तो 'संघर्ष' पर्यंत येवून थांबला. केवळ २१ वर्षाच्या काळात त्यांनी ३२ कादंबऱ्याचे लेखन केले.' कलेसाठी कला की जीवनासाठी कला' या वैचारिक वादळात आपल्या स्वत:च्या लेखनाचा दिवा लावून तो प्रखरपणे पेटता ठेवण्याचे अनमोल कार्य अण्णाभाऊंनी केले. आपल्या अवतीभोवती आपले विशाल जीवन जगण्याची धडपड करणाऱ्या, संघर्ष करणाऱ्या, लोकांचे रोज येणारे अनुभव लेखनातून आपल्या जनतेपुढे मांडण्याच्या प्रेरणेने अण्णाभाऊ लिहित. कृष्णा, कोयना, वारणा, पंचगंगा या नद्यांच्या काठावरील विविध वृत्तीच्या लोकांच्या समतामूलक व्यक्तिमत्वातून अण्णाभाऊंच्या कादंबऱ्या साकारल्याचे दिसून येते.

'वारणेच्या खोऱ्यात' या अण्णा भाऊंच्या पहिल्याच कादंबरीत १९४२ च्या चळवळीवेळीचे स्वानुभव अभिव्यक्त करताना,या कादंबरीच्या 'हिंदुराव' या बंडखोर पात्राच्या सहाय्याने आमच्या कृती या समतेसाठीच असल्याचे सांगितले आहे. समतेचे स्वातंत्र्य अस्तित्वात आणण्यासाठी गरीब – श्रीमंत, धनी – चाकर यासारखा कोणताही भेद राहू नये.यासाठीच वारणा खोऱ्यातील क्रांतीकारी आणि ऐतिहासिक घटनांवर आधारित ही कादंबरी आविष्कृत होताना दिसते.तरुणांची चळवळ उभी करून सरंजामशाही वृत्तीच्या विरोधात बंड करणारा 'हिंदुराव' हा समता अभिलाषी जाणवतो.

'फकीरा' या कादंबरीत वारणेच्या खोऱ्यात, डोंगर दऱ्यातून ज्याचे व्यक्तिमत्व धाडसी, करारी, शूर आणि निधड्या छातीचे बनत गेले त्या 'फकिराचे' चित्रण अण्णाभाऊनी केले आहे. दलितांवरील अन्याय आणि गुलामगिरीबद्दल प्रचंड राग असणारा फकिरा, त्या काळात गुन्हेगार म्हणून गणल्या गेलेल्या मांग जातीचे प्रतिनिधित्व करत होता.जुलमी व्यवस्थेविरुध्द बंड व विद्रोह करणारा फकिरा, माणुसकी जपत समता व स्वातंत्र्याच्या मार्गाने बंधुता स्थापित करण्याचा प्रयत्न करणारा जाणवतो. समतेच्या विचाराच्या मुळाशी असणारा आंबेडकरवाद आणि मार्क्सवाद अण्णा भाऊंच्या 'फकिरा' मध्ये दिसतो. स्वत:च्या बापाचा खून करणाऱ्या बापू खोतावर द्या करणारा 'फकिरा', इंग्रजांचे धान्याची गोदामे लुटून गोरगरीबाना वाटणारा 'फकिरा', न्यायाची चाड आणि अन्यायाची चीड असणारा 'फकिरा' हा समतावादी दृष्टीकोनातून क्रांतीकारक आणि सामाजिक विचारांचा असल्याचे दिसते. 'माणूसकेंद्री' समाजकार्यातील गुन्हेगारी कृत्यांना विषमतेवरील हल्ला मानून समतातत्वाच्या दृष्टीने फकिरा

कार्य करतो. या दृष्टीने फकिरा या कादंबरीत समतामुल्यांचे वर्णन आलेले आहे.

अण्णा भाऊ साठे यांच्या 'वारणेचा वाघ' या कादंबरीतील 'सत्याबा' हा नायकही अन्यायाच्या विरोधात बंड करणारा एक कुणबी समाजातील तरून आहे. गरोदर महिलेला अमानुषपणे मारहाण होत असताना प्रस्थापित व वर्णश्रेष्ठी नराधमाचा खून करून आपली नितीमत्ता दाखविणारा तरुण हा वर्णविरोधी, विषमताविरोधी व नीतिमान दिसतो. कोणत्याही कारणाने बलाढ्य हा दुर्बलावर अन्याय करत असतो. अण्णा भाऊ साठे यांच्या अशा अन्यायाविरोधात बंड करणाऱ्या अनेक नायकापैकी एक म्हणजे सत्याबा होय.

'वैर' या कादंबरीतील इनामदार व त्याचे साथी गोरगरीबांना फसविण्याचे चित्र रेखाटले आहे. गरीब-श्रीमंत यातील भेद ठळक असलेल्या काळात इनामदारांसारख्या लोकांमुळे गरिबांना आपले आयुष्य जगणे जिकीरीचे होत असते. वर्गवादी व्यवस्थेवर भाष्य करणारी ही कादंबरी आहे.

एक समतावादी भाष्यकार म्हणून अण्णा भाऊ साठे यांच्या कादंबऱ्यातून विस्थापित कामगार, शेतकरी, शेतमजूर यांच्या व्यथा, भटक्यांच्या परंपरेमध्येही बंडखोरी बाळगणारे, दलित, पिडीत, शोषितांच्या जगण्याचे चित्र मांडणाऱ्या आहेत. आजही जाती व्यवस्थेचा प्रचंड प्रभाव असणारी जनता आहे. त्यामुळे अण्णा भाऊच्या साहित्यामध्ये विषमतावादाचे समर्थकही भेटतात. मात्र अशा समर्थकांना योग्य उत्तर देत , 'स्व-त्व' जपणारी पात्रे अण्णा भाऊच्या लेखनाचे शक्तीस्थळ मानावे लागेल.अशी शक्तीस्थळे 'आघात', 'चित्रा', 'संघर्ष', 'गुलाम', 'मयुर', 'चंदन', 'मूर्ती', 'मंगला', 'वारणेचा वाघ' इत्यादी कादंबऱ्यातून ठिकठिकाणी पाहवयास मिळतात. अण्णा भाऊनी धनदांडग्यांचा सर्वसामान्यांवर होणारा अन्याय, जुलूम, अत्याचार, पिळवणूक इ. वर प्रसंगपरत्वे हल्ला चढविला आहे. त्यातूनच परिवर्तनवादी, पुरोगामी, स्वाभिमानी लोकांची ओळख होते. की जे न्यायाचा आग्रह धरून वर्ण, जात, लिंग, भाषा, वंशभेदाच्या पलिकडे जावून आपले तत्वज्ञान मांडतात, आपले अस्तित्व दाखवितात. अशा वैश्विक व समतावादी दृष्टीच्या लेखकाने आपल्या साहित्यातून विषमतेला नाकारले आहे.

समारोप :

समता हे मानवी जीवनातील महत्वाचे मूल्य मानावे लागते. अण्णाभाऊच्या सर्वच साहित्यामध्ये समता या मूल्याचा अविष्कार पाहवयास मिळतो. केवळ विषमतेमुळे गुणवान व पात्र माणूस विकासाच्या संधीपासून वंचित राहतो.अशाव्यवस्थेबद्दलची चीड अण्णाभाऊंच्या साहित्यामध्ये प्रखरपणे जाणवते. म्हणूनच समताधिष्ठित समाजाची पुनर्रचना करू पाहणाऱ्या नायकांच्या व व्यक्तिरेखांच्या माध्यामातून अण्णा भाऊ साठे अभिव्यक्त होताना दिसतात. तर तत्कालीन दर्जाहीन म्हणून गणलेल्या जातीतील अनेक लोकांचा स्वाभिमान, करारीपणा, बंडखोरी, त्यागी वृत्ती असणाऱ्या लोकांना आपल्या कथेचा नायक अथवा नायिका बनवून मानवी मूल्यांचा पुरस्कार करताना दिसतात. हे समतामूल्य प्रस्थापित करण्याच्या हेतूनेच कथा, कादंबरी, प्रवासवर्णन, लोकनाट्य, पोवाडे इत्यादी वाड्मय प्रकारात मनमुराद परिक्रमा करणारे महान लेखक म्हणून अण्णा भाऊ साठे यांचे स्थान महत्वाचे आहे. हे संत तुकारामांच्या उक्तीप्रमाणे

'जाळीन मी भेद । येथे प्रमाण तो वेद
दया तिचे नाव भूतांचे पाळण । आणिक निर्दालन कंटकाचे'

या पातळीवर विद्रोही भुमिकेचा समतेसाठी विचार करता अण्णा भाऊ साठे यांनी ' जग बदल घालुनि घाव , सांगून गेले मज भीमराव ' असे सांगत समतेचा आग्रह धरलेला आहे.

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CONTENTS OF ENGLISH

9. Superstitious Beliefs among Rural Youth

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Abstract

Superstitions exist everywhere, whether you live in a city or a village. Indian society is progressing rapidly, yet there are many people who strongly believe in superstitions. These superstitions are an expression of the tensions and anxieties that dominate humanity as it struggles through the dark alleys of life from birth to death, afflicting people regardless of educational status and wealth. This study was conducted to find out the superstitious beliefs of rural youth. The sample consisted of 120 graduate students from rural area of Sangli district of Maharashtra state. Superstitious Beliefs scale was used to collect data. The statistical techniques such as Mean, Standard-Deviation and t-test were employed. The results revealed that there exists no significant gender difference among youth in superstitious belief and faculty of study slightly but not significantly differ youth from each other with respect to superstitious belief.

Introduction

A superstition is a belief or practice based on luck, supernatural powers or magical elements due to lack of scientific knowledge. Superstitious attitude is totally relying on super-natural or unreasonable belief in magic or mysteries or supernatural objects, witchcraft and object rituals. Superstitious attitude is generally based on mysterious and irrational fear of 'Unknown'. It arises from illiteracy, not knowing the science behind it, or fear and belief in magic or fate. It is derived from the words superstition or supernatural. Superstition is applied to beliefs and practices related to fortune, prophecy, and spiritual matters. Instead of having scientific attitude towards life, people take decisions totally based on superstitions. They do not think rationally and logically and thus take wr ng decisions. Such attitude makes a man totally rely or dependent on their fate. Most people including highly educated individuals act superstitiously from time to time. Scholars once believed all superstitions dated back to man early history. But many Superstitions have appeared in relatively recent times. There are different kinds of superstitions. Some superstitions deal with important events in person's life.

Birth, Marriage, pregnancy and death are the important event in our life. The cultural and religious roots of superstition are frequently intertwined.

It would not be wrong to say that superstitions have existed since ancient times. For some people, superstition rules their lives. They cannot go home peacefully after a black cat crosses their path. Hotels refuse to have the thirteenth floor or room number 13 because people believe that the number 13 is unlucky. People do not go out for work if a mirror is broken or milk is spilled, as it is considered inauspicious. Interest in observing superstitions has clearly not waned over the years as they seem to affect not only day-to-day activities but also business, markets, economy and purchasing behavior.

According to Merriam-Webster Dictionary, superstition is a belief or practice resulting from ignorance, fear of the unknown, trust in magic or chance, or a false conception of causation, an irrational abject attitude of mind toward the supernatural, nature, or God resulting from superstition and a notion maintained despite evidence to the contrary. According to Cambridge dictionary, superstition is a belief that is not based on human reason or scientific knowledge is connected with old ideas about magic. According to Britannica Dictionary, superstition is a belief or way of behaving that is based on fear of the unknown and faith in magic or luck: a belief that certain events or things will bring good or bad luck. According to Oxford Learner's Dictionary, superstition is a belief that particular events happen in a way that cannot be explained by reason or science; the belief that particular events bring good or bad luck

Superstition refers to any belief or practice that is caused by supernatural causality, and which contradicts modern science. Superstitious beliefs and practices often vary from one person to another or from one culture to another. Common examples of superstitious beliefs in India include:

- A black cat crossing the road symbolizes bad luck
- A crow cawing indicates that guests are arriving
- Drinking milk after eating fish causes skin diseases
- Seeing a mongoose symbolizes to be very lucky
- Itchy palms mean that money is coming your way

Superstitions exist everywhere, whether you live in a city or a village. Indian society is progressing rapidly, yet there are many people who strongly believe in superstitions. These superstitions are an expression of the tensions and anxieties that dominate humanity as it

struggles through the dark alleys of life from birth to death, afflicting people regardless of educational status and wealth.

Believing in superstitions shows backward thinking and lack of scientific approach to life. However, superstitions affect different people to different extents as women tend to be more superstitious than men. Women are often physically and sexually abused in the name of superstition. Many have to endure the exploitation of BABA's and SADHU's. Killing animals is often a part of superstition. Poor and superstitious people seek treatment from petty people instead of relying on modern health system. Belief in magic attracts people to witchcraft. The practice of witchcraft has serious effects on the psyche of children and women.

People who don't believe in themselves and don't believe in their hard work have a simpler and safer routine. That is why these people easily believe in superstitions. Moreover, this is also the reason why most superstitions are related to the fear of loss and damage to one's property. Researchers have found that people in rural areas are more superstitious than those in urban areas. Education and awareness is the only solution to remove superstitions. It can also be eradicated by developing the power of reasoning, thinking from a scientific perspective and making a habit of analyzing things logically. Young generation should take appropriate steps to root out superstitions. But the youth also seems to be a victim of superstitions. Therefore, in the present study, a comparative study of the superstitions of the youth in rural areas has been done.

Review of Literature

Gupta and Joshi (2013) searched the superstitious attitude in relation to SES among adolescents. They revealed that there exists no significant gender differences in adolescents on Superstitious beliefs but respondents of low SES had reported significantly more superstitious beliefs than high SES respondents.

Sagone and De Caroli (2014) studied locus of control and beliefs about superstition and luck in adolescents: what's their relationship? Results of the study showed that middle adolescents were more superstitious and greatly believed in good luck than late adolescents. The adolescents who were internally locus of control they have less believed in superstition. On the contrary, the adolescents who were externally locus of control they have more faith in superstition and good luck.

Dayal (2015) studied superstitious attitude among women. The study was conducted to compare the superstitious attitude of working and non-working women. The sample consisted of

200 women from Ludhiana district of Punjab state. The results revealed that there exists a significant difference in superstitious attitude of working and non-working women but married and unmarried women possess same attitude towards superstitions.

Harish (2016) studied superstitions in society and steps to eradicate. The study focuses on the most important aspects of the causes of superstition are ignorance, fighting religion, opportunist's abuse and ignorant caring with some scientific weaknesses. In the society the number of superstitions are going on with the different issues in the community in the meanwhile we have to take some precaution to eradicate and to give with the suggested remedies like thinking positively, parental guidelines, teacher guidelines, enlightening the campaigns, role of media and developing the scientific attitude, scientific thinking and inculcations of the scientific methods in day to day life, in this way we can overcome from the superstitions in the society to change the life styles of the modern era.

Singh (2019) studied superstitions among adolescents in relation to modernization. The results showed that there is a significant difference in the level of superstition of male and female adolescents and no significant difference in the level of superstition of urban and rural adolescents. There is a significant difference in the level of modernization of urban and rural adolescents and no significant difference in level of modernization of male and female adolescents.

Khan and Mohi-uddin (2020) studied superstitions in urban and rural areas. The results showed that there is significant difference among Arts & Science students in urban area in relation to superstitions. There is no significant difference among Arts & Science students in rural area in relation to superstitions.

Narah and Taku (2020) studied impact and consequence of superstition on society especially in the field of living context. The research throws light on the impact of superstition on negative and positive aspects on the society especially how can psychologically behave the people through believing superstition. Superstition can be great loss of the people if they are blindly diving in this aspect. Also in this study clearly analyzed the causes, demerits as well as merits of superstition and an attempt has been made to some significant suggestion.

Method

Aim of the Study

The main aim of the study is to find out superstitious beliefs among rural youth.

Objectives of the Study

1. To assess superstitious belief among rural youth.
2. To search gender differences among youth on superstitious belief.
3. To find out the difference between faculty of study of youth in relation to superstitious belief.

Hypotheses of the Study:

1. Girls cherish more superstitious belief than boys.
2. Youth from Science faculty are less superstitious than faculty of Arts.
3. Youth from Commerce faculty are more superstitious than faculty of Science.

Sample

Total sample of the study was 60. Stratified random sampling technique was used for collection of data. The data were collected from rural area colleges of Sangli district. Age range of the subjects was 19 to 22 yrs. All the subjects were studying last year of Graduation. Male-female ratio was 1:1.

Tools used for Data Collection

Superstitious Beliefs Scale

This scale was constructed and standardized by Nath (1996). The scale consists of 25 items. Each item is provided with two alternatives i.e. True / False. The Ss has to read each statement and decide whether it is true or false and then he has to write the response. The reliability coefficient was 0.86 and validity was 0.74. On this scale more score means more superstitious beliefs.

Procedure of Data Collection

The data were collected online by Google Form. First the instructions of filling of google form were given to students. Then link of google form sent to students on their WhatsApp group. Lastly data collected from excel sheet.

Statistical Treatment of the Data

The statistical techniques such as Mean, Standard Deviation and 't' test were used for interpretation of the data.

Results and Discussion

Table 1: Mean, SD and 't' value of Boys and Girls on Superstitious Belief

Variable	Gender	N	Mean	SD	df	't' value	Level of significance
Superstitious Belief	Boys	60	9.72	4.57	118	**0.15**	**Not Significant**
	Girls	60	8.47	4.04			

Significance Level: **0.01, *0.05

Table 1 shows that superstitious belief of 120 boys and girls. The mean of boys group is 9.72 with SD 4.57, while the mean of girls group is 8.47 with SD 4.04. Mean score of boys greater than girls shows that averagely boys are more superstitious than girls. But 't' value of both group is 0.15, which is not significant at 0.05 level of significance. Thus the first hypothesis that, "Girls cherish more superstitious belief than boys" is not accepted. This result shows there is no gender difference on superstitious belief because today girls are also getting education at par with boys. As a result of education reducing superstition among girls, there is no difference in superstitious belief between girls and boys. Along with boys, girls are also developing a scientific approach. This result corroborates with results of Gupta and Joshi (2013) but not corroborated with the results of Singh (2019).

Table 2: Mean, SD and 't' value of Arts and Science Youth on Superstitious Belief

Variable	Gender	N	Mean	SD	df	't' value	Level of significance
Superstitious Belief	Arts	40	9.98	4.28	78	**0.05**	**Not Significant**
	Science	40	8.08	4.23			

Significance Level: **0.01, *0.05

Table 2 shows that superstitious belief of 80 Arts and Science faculty youth. The mean of Arts faculty group is 9.98 with SD 4.28, while the mean of Science faculty group is 8.08 with SD 4.23. Mean score of Arts faculty group is greater than Science faculty group shows that averagely Science faculty group is less superstitious than Arts faculty group. Because scientific approach is more inculcated in the students of science faculty through experiments. Hence, they have less superstitious belief than Arts faculty students. But 't' value of both group is 0.05, which is not significant at 0.05 level of significance. Thus the second hypothesis that, "Youth from Science faculty are less superstitious than faculty of Arts" is not accepted. This result shows there is no difference in faculty of study on superstitious belief. This result corroborates with results of Khan and Mohi-uddin (2020).

Table 3: Mean, SD and 't' value of Science and Commerce Youth on Superstitious Belief

Variable	Gender	N	Mean	SD	df	't' value	Level of significance
Superstitious Belief	Science	40	8.08	4.23	78	**0.27**	**Not Significant**
	Commerce	40	9.22	4.41			

Significance Level: **0.01, *0.05

Table 3 shows that superstitious belief of 80 Science and Commerce faculty youth. The mean of Science faculty group is 8.08 with SD 4.23, while the mean of Commerce faculty group is 9.22 with SD 4.41. Mean score of Commerce faculty group is greater than Science faculty group shows that averagely Commerce faculty group is more superstitious than Science faculty group. Because scientific approach is more inculcated in the students of science faculty through experiments. But, Commerce faculty is less attached with scientific approach as well as social activity, hence, they have more superstitious belief than Science faculty students. But, 't' value of both group is 0.27, which is not significant at 0.05 level of significance. Thus the third hypothesis that, "Youth from Commerce faculty are more superstitious than faculty of Science" is not accepted. This result shows there is no difference in faculty of study on superstitious belief.

Conclusions

On the basis of analysis given in previous paragraphs, it can be concluded that:

1. There is no gender difference among youth related to superstitious belief.
2. Youth from Science faculty are slightly but not significantly less superstitious beliefs than faculty of Arts.
3. Youth from Commerce and Science faculty have same beliefs towards superstitions.

Recommendations

1. Education of scientific attitude must be started from school level.
2. Superstitions must be wiped out by law.
3. The government should make strictly use of the Anti-Superstition Law.
4. People should give up old traditions which are based on superstitions.
5. Society should inculcate rationality in thinking and behavior of new generation.

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