

Efforts for quality biomass of earthworm *Eudrilus eugeniae* by using tomato powder

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ABSTRACT

Earthworm species *Eudrilus eugeniae* is very excellent worm for vermicomposting and rich in protein, lipid and carbohydrates. Also rich in vitamins, similarly earthworms are soil inhabiting organisms and can-do wonderful job for man and biosphere. Therefore, present piece of work has been conducted to explore the effect of tomato powder on the growth and reproductive potential of earthworm species *E. eugeniae*. Earthworm feed along with tomato powder for 72 hours and used for vermicomposting of soil, cow dung, tomato powder. At the end of 60 days of experiment worm shown significant increase in weight of worms, increased no. of cocoons and juveniles. The result indicates that tomato powder is found to be good for growth of earthworm biomass. It is a feasible technology for tomato growers, earthworm growers, farmers, traders and for pharmacists.

Key words: Tomato powder, Soil, Cow dung, *Eudrilus eugeniae*.

INTRODUCTION

Earthworm has dynamic potential and can do wonderful jobs for man and biosphere (Tripathi, 2003, Patole and More, 2016.). Earthworms are used as protein rich sources of animal feed. They contain 70-80% protein in a dry weight and also contain essential amino acids, especially lysine rich. The amino acid composition of earthworm is superior for fish meal (Bhorgin, 2012). Earthworms contain all five types of food for human consumption (Julka, 1988). Earthworms are known to be associated with medicines since ancient time to cure various human diseases. In India paste of dried worm were prepare for curing disease in Unani system of medicines for treating wounds, chronic boils, piles, hernia and impotency when applied externally and also have been used in folk medicine to treat pyorrhoea and small pox diseases (Edwin et al, 2012). Earthworms have found to be excellent in vitamin B-complex. Among all these niacin and vitamin B₁₂ are of significant value (Edward, 1985 and Antha et al., 2012). Modern society is unable to

Effect of Yoga practices with suryanamaskar on flexibility, BMI, Hb level in underweight anemic college students

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ABSTRACT

The main aim of this study is to find out the effect of Yoga suryanamaskara on flexibility, BMI and anemia in underweight anemic college students. Anemia hampered the strength, efficiency and health. Yoga has become part and partial of our healthy life and empowerment. For this study, 50 underweight (BMI < 18.50) and anemic students aged between 18-22 years who were willingly to participate in the program were selected randomly as subjects from Senior College, Pimpalner, Dhule (MS) for 60 days program from 1st Nov. to 30th Dec. 2018. They were divided into an experimental group and a control group. Yogic practices were progressively introduced to the experimental group on six days in a week for nearly 60 to 70 minutes. The therapy was carried out in the evening from 5.30 pm to 6.45 pm in Maratha mangal Karyalaya, Pimpalner, Dist. Dhule. The control group was not exposed to any yogic practices. Assessment has been done before and after study for the parameters like flexibility, height, weight and Hb% for both groups. After the Yoga therapy every student showed significant positive improvement in flexibility, weight gaining and Hb level among experimental group when compared to control group. Flexibility, BMI and Hb level showed a significant improvement.

Key words: Yoga, suryanamaskar, BMI, Flexibility, underweight, Hb etc.

INTRODUCTION

Flexibility is an important ability for health related fitness. Lack of flexibility in back can be cause for bad posture, back pain and many more may be due to compression of peripheral nerves. With good flexibility an individual have great ease movements, less chance of injury during movements (Miller 2006). The practice of asanas is one of the best ways to improve flexibility. There are plenty of studies have been done to see the effect of yogic asanas on flexibility and suryanamaskar is itself combination of six asanas (Bhavanani 2011). What happens when you are underweight? Some people might be underweight genetically, others are probably under the mark because they don't get required nutrients to remain in the pink of health.

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Thin Film Characterization Techniques ———A Theoretical Background

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Abstract:

The advancement of science and technology in the recent years has replaced the traditional and laborious experimental techniques of analysis by sophisticated instrumental techniques of analysis, which give more accurate and reproducible results. This paper describes various experimental techniques used for the characterization of thin films.

Introduction:

The experimental details pertain to the evaluation of various properties using analytical techniques viz. X-ray diffraction (XRD), energy dispersive analysis by X-rays (EDAX), scanning electron microscopy (SEM), transmission electron microscope (TEM), optical absorption, Fourier transform infrared spectrophotometer (FTIR) and various aspects concerning with new devices formation.

Discussions:

Structural Studies (XRD): X-ray diffraction (XRD) is an important technique for material characterization. XRD enables information to be obtained on atomic scale from both crystalline and non crystalline materials. This technique was also used to determine crystal structure of metals and alloys, minerals, ceramics, semiconductors, inorganic compounds, polymers and organic materials. X-ray diffraction (XRD) technique is used for the realization of structural property and can be employed exclusively to categorize the crystalline phase in the sample. This technique is suitable for both form of samples i.e. thin film as well as bulk and can yield the information regarding the crystallinity of the material, nature of the phase present, lattice parameter, grain size out of plane orientation. In case of thin film, the change in lattice parameter with respect to the bulk gives the idea of nature of strain present in the film.

X-ray diffraction method is specially used for the investigation of the internal structures. It is now known that this internal structure consists of a regular arrangement of atoms, which follow certain laws of symmetry. Bragg's explains the fundamental of XRD equation, which places the condition for the constructive interference for the scattered X-ray from the successive atomic planes, formed by the crystal lattice of the material. The Bragg's condition is formulated by

$$2d\sin\theta = n\lambda$$

where, λ is the wavelength of the incident X-ray, d is the interplaner distance, θ is the scattering angle and n is an integer for the order of diffraction.

The full width at half maximum (FWHM) of the plot estimates the size of the grains in the film with respect to the sample normal. A given substance always produces a characteristic diffraction pattern, whether that substance is present in the pure state or as one constituent of a mixture of substances. The powder pattern of a substance is characteristic of that substance and form a sort of fingerprint by which the substance may be identified. Any one powder pattern is characterized

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डॉ. आनंद गुलाबराव खरात

कर्मवीर आ.मा.पाटील कला-वाणिज्य,

के.एन.के.पाटील विज्ञान महाविद्यालय, पिंगलनेर, जि.धुले (महा.)

परिवार में दाम्पत्य जीवन को महत्व दिया गया है ! सुखद पारिवारिक जीवन समाज की शक्ति का स्रोत है ! यह जितना सच है उतना ही सच यह है कि युगीन परिवर्तनों से सशक्त पारिवारिक संबंधों का विघटन हो रहा है ! इसके लिए बाह्य परिस्थितियों के साथ-साथ व्यक्ति के स्वभाव में आया परिवर्तन भी कारण सिद्ध होता है ! साठोत्तरी काल में दाम्पत्य जीवन की मान्यताएँ बदल गयीं हैं ! औद्योगिकरण, शहरीकरण, भौतिक विकास आदि ने नैतिक मूल्यों को चुनौती दी है ! पश्चिमी सभ्यता के बढ़ते प्रभाव ने मानव को व्यवसाय-नौकरियों में स्वतंत्रता प्राप्त हुई है परिणामतः लोग अपना गांव-घर छोड़कर कहीं और जाकर अपना परिवार बसा रहे हैं ! मनुष्य को विभिन्न परिस्थितियों से शारीरिक एवं मानसिक संघर्ष करना पड़ रहा है !

वर्तमान समय में पति-पत्नी के संबंधों में आमूल परिवर्तन हुआ है ! भौतिक सुख-सुविधाओं, ऐशो-आराम के समस्त साधनों से संपन्न तथा सामाजिक दृष्टि से सम्मानित परिवार में भी पति-पत्नी में तनाव की स्थिति उत्पन्न होती है ! “मनुष्य चाहे स्त्री हो या पुरुष अपने जीवन में सरसता की चाह करता है ! पति द्वारा जब पत्नी को मानसिक संतुष्टी नहीं मिलती तो वह उसे बाहर खोजने की कोशिश करती है !” एक बात महत्वपूर्ण मालूम होती है कि पारिवारिक जीवन की सफलता शारीरिक एवं मानसिक स्तर पर मिलन की सार्थकता पर निर्भर होती है ! अगर परिवार विघटन नहीं हो पाया तो कभी-कभी पति या पत्नी किसी अन्य से अपनी यौन संतुष्टि पूरी करते हैं ! इससे दोनों में मानसिक तनाव या टकराव बढ़ जाते हैं और परिवार विघटन हो जाता है ! मंजुल भगत के उपन्यास ‘टूटा हुआ इंद्रधनुष’ में टूटते हुए परिवारों की कथा वर्णित है !

साहित्यकार अपने समय की घटनाओं से प्रभावित होता है ! कोई भी घटना साहित्यकार को लडने और जूझने के लिए मजबूर करती है ! समाज में हर एक व्यक्ति अनुभव प्राप्त करता रहता है ! साहित्यकार भी समाज का एक अंग होता है लेकिन वह संवेदनशील होता है ! उसे कोई घटना इतनी प्रभावित करती है कि उस अनुभव को ही लेखनी के माध्यम से व्यक्तिबोध बनाना पड़ता है ! इस संदर्भ में डॉ. नगेंद्र कहते हैं - “कृति के पीछे उसके कर्ता का व्यक्तित्व रहता है, लेकिन साथ ही यह भी पूरे आग्रह के साथ कहा जा सकता है कि कर्ता के व्यक्तित्व के पीछे उसका देशकाल विद्यमान रहता है !” मंजुल भगत ने जो भी लिखा वह सामान्य वर्ग से ही लिया है ! उनमें तो भारतीय संस्कृति की नारी लबालब भरी हुयी है ! मंजुल भगत ने सहिष्णुता, सुख-दुःख, अभावग्रस्त जीवन को यथार्थ के स्वर दिये हैं !

मंजुल भगत एक संवेदनशील लेखिका है जो साहित्य के प्रति पूरी तरह से ईमानदार है तथा उनका साहित्य भी हर समस्या के प्रति खुली नजर से देखता है ! इस संबंध में डॉ.सविता कित्तें कहती हैं-“मंजुल भगत युवा पीढ़ी की उन समर्थ लेखिकाओं में से एक हैं जिन्होंने व्यक्तित्व को अच्छी तरह से पहचाना है और उसे चित्रित करने में अपनी गहरी व्यापक संवेदना का परिचय दिया है ! उनके अनुसार उनके पात्र न कायर, न विद्रोही हैं !” तात्पर्य मंजुल भगत

का साहित्य समाज की गति और प्रगति को बखुबी चित्रित करता है ! उन्होंने अपने साहित्य को विषयों में नहीं बाँधा है ! इस संबंध में निर्मला जैन कहती हैं - “मंजुल की कहानियों की बहुत बड़ी शक्ति, कैमरे के लेंस की तरह अपने विषय को फोकस में बनाये रखने की यही सामर्थ्य है ! जहाँ कहानी की संभावना न दिखाई पड़ती हो, वहाँ थी ! उसमें कहानी पन पैदा कर ले जाने का रचनात्मक कौशल उनके रचना संसार को बड़ा परिचित, जीवन और विश्वसनीय बनाता है !” तात्पर्य मंजुल भगत सिद्धहस्त कथाकार है !

मंजुल भगत ने कहानी और उपन्यास पर विशेष रूप से अपनी कलम चलायी है ! उनके कथा साहित्य में नारी शोषण, प्रणय प्रसंग, स्वच्छंदता, विवाह की समस्याएँ, नारी सम्मान, यौन शोषण आदि विशेषताएँ मुखरित हुयी हैं ! मंजुल भगत का साहित्य विभिन्न मोड़ों से गुजरता है ! माता, पत्नी, बहन से लेकर देह और प्यास बनती नारी तक का सफर दिखाई देता है !

‘टूटा हुआ इंद्रधनुष’ मंजुल भगत का पहला उपन्यास है ! जो १९७६ में प्रकाशित हुआ है ! प्रस्तुत उपन्यास में शोभना और मनीष की प्रेमकथा का वर्णन है ! लेकिन शोभना जिससे प्रेम करती है उससे शादी नहीं करना चाहती क्योंकि उससे प्रेम की सीमा छोटी हो जाती है ! मनीष भी उससे अलग हो जाता है ! शोभना प्रभात से शादी कर एक बच्चा भी पैदा करती है ! लेकिन प्रभात की गैरहाजिरी में मनीष से सेक्स संबंध स्थापित करने में शोभना कोई बुरा नहीं मानती ! शोभना जिस प्रकार दो पाठों में जीती रही है उसी प्रकार उसकी बेटी न जिये इसलिए अपनी बेटी के प्रेम विवाह को मंजुरी देकर शोभना प्रेम के साथ प्रणय करती है ! इस संदर्भ में कमलकिशोर गोयनका लिखते हैं - “मंजुल भगत ने अपनी नायिका को वैवाहिक जीवन और घर के बंधनों के साथ अपने प्रेम को उन्मुक्त होकर जीने का अवसर दिया है, बिना इसकी चिंता किए हुए कि पति, संतान और समाज की क्या प्रतिक्रिया होगी ! शोभना के विवाह के बाद पूर्व प्रेमी से यौन संबंधों तथा उससे अवैध संतान के उत्पन्न होने पर कहीं से भी कोई प्रतिक्रिया नहीं होती ! यह निश्चय ही असहज स्थिति है ! संभवतः लेखिका स्त्री को यह आजादी देना चाहती है कि, वह परिवार, विवाह की मर्यादा में बँधकर भी अपने प्रेम और यौन संबंधों के लिए स्वतंत्र है और यहाँ तक कि वह अन्य पुरुष से संतान भी उत्पन्न कर सकती है ! उपन्यास

EFFECT OF BIODEGRADABLE PLASTIC PAPER ON GROWTH AND REPRODUCTION OF EARTHWORM, *EUDRILUS EUGENIAE*.

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ABSTRACT

Present study deals with the effect of biodegradable plastic paper on growth and reproduction of earthworm (*Eudrilus eugeniae*). A mixture of Soil + Cow-dung + Earthworms was treated as control, whereas this mixture along with biodegradable plastic paper (1%) served as experimental material. The mixtures were incubated for 60 days, and thereafter, growth and reproductive performance of earthworm was observed. Maximum growth, number juveniles and cocoons were recorded in control, while those were significantly decreased in the experimental material. Thus, severe effect of biodegradable plastic on growth and reproduction of earthworm was observed.

Keywords: Biodegradable plastic, soil, cow-dung, earthworm, juveniles. Cocoons

Introduction

Earthworm have been proved as the best decomposers of organic waste (More and Patole, 2013). Present investigation was undertaken to find out the effect of biodegradable plastic paper fragments (which is often used by the farmers for mulching, covering and other farm operations) on reproductive behaviour of earthworm (*Eudrilus eugeniae*).

Material and methods

The earthworms were procured from horticulture nursery, Department of Agriculture, Sakri, Dist. Dhule. Those were maintained in the mixture of cow dung and soil for 15 days. One month old cow dung (CD) and black cotton soil was collected from cow shed and agricultural field respectively. Biodegradable plastic paper was purchased from local market.

The experiment was performed in the plastic bags having capacity of around 5 kg. Two groups of vermi-beds were prepared. The control vermi-bed contained 50 % soil + 50 % CD + earthworms (50), while experimental vermi-bed was comprised of 49 % soil + 50 % CD + 1 % biodegradable plastic + earthworms (50). Sufficient water was added to the mixtures so as to keep them moist.

Biodegradable plastic paper was cut into pieces (1 cm x 1 cm) and mixed with experimental beds. Worms with equal size were selected, their weights recorded and then added in both control and experimental beds next day. The bags were kept in the laboratory undisturbed for 60 days with intermittent water spray.

The experiment was terminated on the 60th day. The contents were removed and dried for two days. All large worms, small juveniles and Cocoons were carefully removed, washed, counted, dried and their dry weights were recorded.

Results and discussion**Table 1 : Effect of plastic on earthworm**

Sr. No.	Group	Weight of worms (g)		% increase	count	
		Initial	Final		cocoons	juveniles
1	Control	24	33	37.5	30	62
2	Experimental	23	28	21.7	22	56

The results obtained have been summarised in Table 1. Both vermi-beds showed increase in the weight of worms, however, the weight of the worms from control group was higher than that noticed in the experimental group. It seems that

biodegradable plastic papers might have eaten by earthworms.

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Effect of solarisation on macronutrient content of the soil

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ABSTRACT: Soil is important abiotic factor in the nature and provide habitat for plants and animals. Soil can hold water and act as important source of nutrients for the plants. Nutrient content of the soil is affected by several factors. The present piece of work deals with the study of the effect of sunlight on macronutrient content. The experiment was carried for six month. Black cotton soil was kept in two iron troughs having around 5 Kg capacity. One were kept in sunlight and second were under the shade. At the end of the experiment i.e. after six month macronutrient parameters like N,P,K was measured by using AAS and Kjeldal method. We found significant increase in P and K content in the soil and decrease recorded in N (Nitrogen) as compare to control soil kept under the shade. We concluded that solarisation can increase the nutrient content. This is feasible technique for soil science and for the farmers

Key words : Soil, Macronutrients, solarisation, AAS, Iron trough etc.

INTRODUCTION: The study of soils known as pedology. Soils serve as natural habitat for plants and animal. It provides water and nutrients to the plants. It is formed by combine action of climatic factors like water, light, temperature, plants, animals and microbes [1]. Dark coloured soil contain more humus which is formed by decomposition of dead animals, plant and micro-organisms. It is more important to plants and crops. It makes soil fertile and provide nutrient to the plants. It can retain high amount of water and also increases the aeration and percolation of water [2]. Soil temperature is also an important environmental factor that regulates the exchange of heat energy between the land surface and the atmosphere. It determines the rate of physical, chemical and biological reaction in soil and has strong influences on plant growth and over the long term on soil formation. Soil temperature controls the physical, chemical and biological process. The temperature of soil alters the rate of organic matter decomposition and the mineralization of different organic matter of the soil, soil temperature also affects soil water retention, transmission

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EFFECT OF YOGA THERAPY ON TSH AND BMI

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ABSTRACT

Twenty men and women subjects were divided in two groups, the experimental or yoga and control groups. Yoga and pranayama therapy was practiced on experimental group. The level of TSH, weight and height of all the subjects were measured and body mass index (BMI) was calculated, before starting yoga and after 6 weeks of yogic training. The influence of yogic practices showed statistically significant decrease s in the levels of TSH and BMI.

Key words: yoga, pranayama, ujai, kapalbhati, hypothyroidism, BMI, TSH.

Introduction

In order to evaluate efficacy of selective yoga therapy in the management of hypothyroidism, and its effect on body mass index (BMI) and Thyroid Stimulating Hormone (TSH) present investigation was undertaken.

Material and Methods

The present research work was carried out in the Department of Zoology, Karm. A. M. Patil Arts, commerce & Kai. Annasaheb N. K. Patil Science Senior College, Pimpalner, District Dhule. The subjects included in this investigation were mild to moderate cases of Hypothyroidism, with Serum TSH level in between 5.0 - 46.6 m IU/ml. Those were within the age group of 18-60 years. The subjects with cardiac diseases, pregnant women, suffering with auto immune diseases, Patients suffering from any kind of diagnosed / clinically seems to be neurological and orthopedic disorders and those having Body weight more than 90 kg were excluded. The subjects were selected from Pimpalner town. The study was under taken at Sant Thakursingh Dnyanpeeth Highschool, Pimpalner.

Twenty subjects were thus included in the experimental trial, after screening by inclusion and exclusion criteria, and randomly segregated into two groups, each group had 10 patients. Group- 1 was Experimental or Yoga group. The subjects from this group were executed to life style modification, including specific Yoga techniques and diet restriction of 1600 Kcal/day.

Group-2 was Control group. The subjects from this group were also executed for life style modification with diet restriction of 1600 Kcal/day.

The study protocol was ethically approved by the Institutional Ethical Committee. An informed consent of the volunteers was undertaken in an approved format. Control group was not exposed to any yogic practices. Yoga therapy was, however, introduced to the experimental group. Which contained Asanas, Pranayamas, Meditation and Relaxation techniques in a proper sequence. Asanas were taught for a period of 30 minutes, Pranayama for 20 minutes, Meditation for 5 minutes and Relaxation for 15 minutes. All the practices were taught gradually.

Yoga schedule included 7 Pranayamas (Bhastrika : 2 - 3 min.,

Kapalbhati : 5-10 min., Bahya with tribandh : 2 times, Anulom-Vilom : 10-20 min., Brahmari and Udgeet : 25min. and Ujjayi : 25times), 12 Asanas (Vajrasana, Suptavajrasana, Simhasana, Tadasana, Trikonasana, Paschimottanasana, Pavanamuktasana, Bhujangasana, Shalabhasana, Dhanurasana, Makarasana and Ustrasana) and Micro-exercises for relaxation of hand and legs, as per the "theory of Swami Ramdev " (Acharya Balkrishna, 2007).

The Yoga program was undertaken from February 1, to March 17, 2017.during 5.30 to 6.45 AM. It was scheduled for 6 days/ week and continued for 6 weeks. The basal level of TSH, weight and height were measured before starting and completion of yogic training. The Body mass index was calculated as BMI = Weight (Kg) / height²(m) as described by Malcolm Kendrick. (2015). Statistical methods used were one way analysis of variance (ANOVA) and student "t" test for descriptive statistics and 'p' value.

Results and Discussion

Table 1 gives an account on pre and post-yoga changes in experimental and control groups. As compared to the non-yoga group, yoga group revealed significant improvement in BMI and TSH levels. Singh and Barnwal (2014) also found significant effect of yogic practices on TSH. Specific yogic poses (Sarvangasana, Halasana, Usthrasana, Matyasana, Bhujagasana) can stimulate throat area by squeezing and stretching, massaging thyroid gland (Chatterjee and Mondal, 2010).

The results obtained during present study are similar to those obtained by Krishna Sharma (2016). Similarly Syeda Islam and Dhiren Deka (2016) also reported that yoga increases TSH level to a normal range. The results, however, are contradictory to the results recorded by Gorden et. al. (2008) who reported no significant change in TSH, T3 & T4 levels after practice of yoga.

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Table1: Effect of yoga on weight, BMI and TSH.

Experimental Criteria	scores		% Relief (significance level)
	Pre -Test	Post-Test	
Weight (in kg.)	74.8	71.2	4.81%*
B. M. I. (kg/m2)	27.23	25.87	4.99%**
TSH mU/ml.	14.45	1.95	86.50%***
Control Criteria	scores		% Relief (significance level)
	Pre -Test	Post-Test	
Weight (in kg.)	72.4	72.1	0.41% NS
B. M. I. (kg/m2)	27.67	27.57	0.36% NS
TSH mU/ml.	12.6	11.8	6.34% NS

All values are expressed as mean score- Weight, BMI-Body Mass Index, TSH-Thyroid Stimulating Hormone, Test-Pre-Before yoga intervention, Test-Post- After yoga intervention, NS-Non Significant (P>0.05), Significant values: *P<0.05, **P<0.01, ***P<0.001.

SEASONAL FLUCTUATIONS IN THE DIVERSITY OF SNAILS FROM MALANGAON RESRVIOR OF DHULE DISTRICT, (M. S.), INDIA.

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Abstract-

Changes in diversity indices of freshwater snails *Bellamya bengalensis* and *Lymanea acuminata* from Malangaon reservoir in Dhule district were studied in three seasons of the year. It was observed that the diversity, density in the form of Shannon- Wiener index, Simpson's index and Pielou's index of both the species were highest in summer, lowest in monsoon and intermediate in winter. The population density of *Bellamya bengalensis*, was 10, 06 and 08 o/m² in summer, monsoon and winter season respectively, while population density of snail species, *Lymanea acuminata*, in summer, monsoon and winter season was 04, 02 and 03 o/m² respectively. The values of Shannon- Wiener diversity index at Malangaon reservoir were 0.5983, 0.5624 and 0.5860 during summer, monsoon and winter season respectively. The values of Simpson's index of diversity at Malangaon reservoir were 0.4396, 0.4286 and 0.4364 during summer, monsoon and winter season respectively. The species richness at Malangaon reservoir was 02. The values of Pielou's index of evenness at Malangaon reservoir were 0.8631, 0.8114 and 0.8454 during summer, monsoon and winter season respectively.

Keywords- Seasonal fluctuations, Diversity, Diversity indices, Malangaon reservoir, Dhule.

Introduction

The biological diversity is very complex and vibrant feature of the Earth. It is the variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part (UNEP, 1992). The biological diversity provides foods, medicines and industrial products to human population. Next to arthropoda, mollusca constitute the second largest invertebrate phylum (Aravind et al., 2008). It is a large group of animals having diverse shapes, sizes, habits and occupies terrestrial and aquatic habitats (Subba Rao, 2003). Molluscans are considered the most diverse and dominant benthic fauna both from lentic and lotic region which are mainly represented by the two major classes namely Gastropods and Pelecypods (Mackie, 1998). Gastropods are common and noticeable elements of the freshwater biota. They are found on the submerged surfaces of substratum in ponds, streams, lakes and rivers. Usually they are found in the water where calcium concentration is more (Tonapi, 1980). They are the dominant grazers of algae and aquatic plants and plays an important role in an aquatic food web as well as in the processing of detritus and decaying organic matter.

The diversity of freshwater molluscs in the ecosystem depends up on the availability of food, shelter and safe oviposition sites. Their abundance might be affected due to the presence of vegetation in the shallow depth, which emerged when the stream was dry during the post monsoon period and formed a good feed leading to their multiplication (Manoharan et al., 2006).

Several factors affect diversity and distribution of snails. These include physicochemical parameters of water as well as biological factors such as availability of food, aquatic macrophytes, competition and predator-prey interactions (Horsák et al., 2007, El-Khayat et al., 2011). Temperature (Kazibwe et al., 2006), pH (Owojori et al., 2006), electrical conductivity (Nyman et al., 2005), alkalinity (Pennak 1989), dissolved oxygen, and Hardness (Kobayashi and Wada; 2004) are related to molluscan diversity.

Seasonality also affects the diversity and distribution of snails. El-Kady et al., (2000) studied the effect of season on snails from Saini peninsula. Similar study was done by Rathore (2003), Karimi et al., (2004), Garg (2009), Tusharkumar Ganghi (2010), Ali Suliman Al-Akel and El Amin Mohamed Suliman (2012), Dhembre (2012), Sharma et al., (2013), Rai and Jauhari (2016) studied effect of seasonality on the distribution of mollusca.

Diversity indices:

A diversity index is a mathematical measure of species diversity in a community. It is common practice among ecologists to complete the description of a community by one or two numbers expressing the "diversity" or the "evenness" of the community. Diversity indices provide more information about community composition than simply species richness (i.e., the number of species present); they also take the relative abundances of different species into account. Many different measures (or indices) of biodiversity have been developed, and compared with one another (Magurran 2004). The basic idea of a diversity index is to obtain a quantitative estimate of biological variability that can be used to compare biological entities. In present study, following diversity indices were studied:

1) Shannon- Wiener diversity index (H):

It is commonly used to characterize species diversity in a community. Shannon's index accounts for both abundance and evenness of the species present. The proportion of species *i* relative to the total number of species (*p_i*) is calculated, and then multiplied by the natural logarithm of this proportion (ln*p_i*). The resulting product is summed across species, and multiplied by -1.



ICHTHYODIVERSITY IN MALANGAON WATER RESERVOIR IN KHANDESH REGION OF MAHARASHTRA, INDIA

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Abstract: The ichthyodiversity were studied during January to December 2012 from Malangaon water reservoir in Khandesh region of Maharashtra state, India. The results revealed that occurrence of 17 species of 15 different genera, 07 families and 05 orders were recorded. The member of order *Cypriniformes* were dominated by 12 species with relative abundance 73%, Perciformes 02 species with relative abundance 16%, *Siluriformes* 01 species with relative abundance 08%, *Synbranchiformes* 01 species with relative abundance 01% and *Osteoglossiformes* 01 species with relative abundance 01%. Fish diversity was assessed by calculating the various diversity indices such as Shannon – Wiener diversity index (H), Simpson’s Dominance index (D), Simpson’s index of diversity (1- D), Evenness index (J).

Index Term- Ichthyodiversity, Malangaon water reservoir, Khandesh, *Cypriniformes*

I. INTRODUCTION

Fish are an important ecological link in the food chain. They have good taste and are easily digestible and growth promoting value. Fishes have a rich source of proteins and other essential nutrients to tide over the nutritional deficiency of man. The demand for seafood and fresh fish is increasing as more people are realizing the health and fitness value of eating fish. Fishes are one of the important elements in the economy of many nations as they have been stable items in the diet of many people. Fishes occupy a significant position in the socio-economic fabric of our country by providing the population not only the nutritious food but also income and employment opportunities.

Fish exhibit the greatest biodiversity of the vertebrates with over 22,000 species. Of these, about 58 percent are marine, 41 percent are freshwater species and 1 percent move back and forth between salt and freshwater. As expected, marine fishes are the most diverse because salt water covers 70 percent of the earth. Only 1 percent of the earth is covered by freshwater. This small area is home to 8,000 species of fresh water fishes (Helfrich and Neves, 2009). Various workers have studied the fish diversity in different regions of Maharashtra, including Shinde *et al.*, (2009) studied ichthyofaunal diversity of Harsool Savangi Dam, Aurangabad. Shaikh *et al.*, (2011) worked on, ichthyofauna diversity in upper Dudhana water reservoir in Jalna District. Joshi *et al.*, (2012) studies ichthyological fauna of District Buldhana. Jaiswal and Ahirrao (2012) studied ichthyodiversity of the Rangavali Dam, Nandurbar District. Kharat *et al.*, (2012) studied freshwater fish fauna of Krishna river at Wai, Northern Western Ghats, India.

In terms of habitat diversity fishes live in almost every conceivable aquatic habitat. There is hardly any water body which does not have fish. The rich diversity of fish is due to the diversity of aquatic habitats and range of water quality in which they can live. In the present work an attempt has been made to study the ichthyodiversity in Malangaon water reservoir in Khandesh region of Maharashtra state, India.

II. RESEARCH METHODOLOGY

For the study of ichthyodiversity, fishes were collected from Malangaon water reservoir in Khandesh region of Maharashtra (India) during January to December 2012 using different types of nets and bharjal by fisherman and also from local fish market. They were immediately photographed with the help of digital camera (Sony DSC W830 Cyber-shot 20.1MP). The fishes were identified by local name and common name as named by local fisherman; and also by Zoological Survey of India (ZSI) Pune.

For determination of diversity indices, total number of species, total number of individuals in a sample and total number of individuals of a species were determined. From these data, Shannon - Weiner Index (H), Simpson’s Dominance Index (D), Simpson’s Index of Diversity (1-D), Pielou’s evenness Index (J) was determined using the following equations.

1. Shannon - Weiner Index (H): It depends on both the number of species present and the abundance of each species.

$$H = \sum P_i (\ln P_i), \quad P_i = A/T$$

Where: P_i is the proportion of each species

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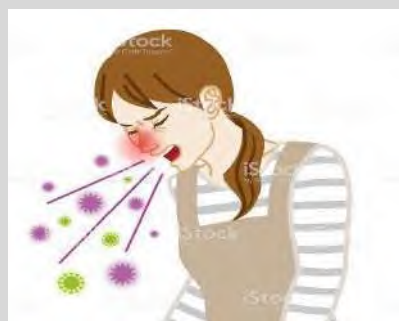
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Role in Prevention of Corona Virus Infection

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Abstract -

Corona virus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2). It was first identified in December 2019 in Wuhan, China, and has since spread globally, resulting in an ongoing pandemic. As of 10 May 2020, more than 4.02 million cases have been reported across 187 countries and territories, resulting in more than 279,000 deaths. More than 1.37 million people have recovered. Common symptoms include fever, cough, fatigue, shortness of breath, and loss of smell and taste. While the majority of cases result in mild symptoms, some progress to acute respiratory distress syndrome (ARDS), multi-organ failure, septic shock, and blood clots. The time from exposure to onset of symptoms is typically around five days but may range from two to fourteen days.

Introduction -

The virus is primarily spread between people during close contact, most often via small droplets produced by coughing, sneezing, and talking. The droplets usually fall to the ground or onto surfaces rather than travelling through air over long distances. Less commonly, people may also become infected by touching a contaminated surface and then touching their face. It is most contagious during the first three days after the onset of symptoms, although spread may be possible before symptoms appear and in later stages of the disease. The standard method of diagnosis is by real-time reverse transcription polymerase chain reaction (rRT-PCR) from a nasopharyngeal swab. Chest CT imaging may also be helpful for diagnosis in individuals where there is a high suspicion of infection based on symptoms and risk factors; however, guidelines do not recommend using it for routine screening.

Recommended measures to prevent infection

include frequent hand washing, maintaining physical distance from others (especially from those with symptoms), quarantine, covering coughs, and keeping unwashed hands away from the face. In addition, the use of a face covering is recommended for those who suspect they have the virus and their caregivers. Recommendations for face covering use by the general public vary, with some authorities recommending, some recommending against, and others requiring their use. There is limited evidence for or against the use of masks (medical or other) in healthy individuals in the wider community.

According to the World Health Organization, there are no available vaccines nor specific antiviral treatments for COVID-19. On 1 May 2020, the United States gave Emergency Use Authorization to the antiviral remdesivir for people hospitalized with severe COVID-19. Management involves the treatment of symptoms, supportive care, isolation, and measures. The World Health Organization (WHO) declared the COVID-19 outbreak a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 and a pandemic on 11 March 2020. Local transmission of the disease has occurred in most countries across all six WHO regions. It is important to note that no fortune teller, astrologer or architect has predicted the corona at the Indian or international level. The important task in the future is to rid the masses of those who propagate and spread unscientific things. Corona urges us to take a positive view of science and research. The name 'Corona' is now well known. Certainly not in a good sense. Today, the whole world is shocked by the disease 'Covid-19' caused by the corona virus. He has never crossed the boundaries of caste, religion, gender, country. I also put 'direction' in it. In all directions, the Corona has penetrated villages and homes. The architect and the person who built the house on his advice are no exception. I don't think anyone would be

COVID19: A CHALLENGE TO SACE

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Introduction -

The word Corona in Coronavirus means crown in Latin. Coronavirus gets its name from crown like spikes that it has on its surface. The virus has been named novel as it has not been identified previously. The outbreak of coronavirus started from Wuhan, Capital of china's Hubei province in December 2019 and has now spread across the globe.

The exact source of 2019 novel Corona virus has not been identified but it is suggested that the virus likely emerged from an animal source. In the word COVID19, CO stands for Corona and for D for disease. This disease was referred as 2019. The term COVID is created by world Health Organization (WHO).

The first Case of COVID19 pandemic in India was reported on 30 January 2020 in Kerala today on 10th May there are nearly 63,000 cases in India. Maharashtra alone accounts for over 20,000 infections.

COVID19 affects different people in different ways. Most infected people will develop mild to moderate illness-

- Common symptoms - fever, dry cough, tiredness
- Less Common symptoms-headache and pain, sore throat, diarrhoea, conjunctivitis, loss of taste or smell, rash on Skin, discoloration of fingers or toes
- Serious Symptoms- difficulty in breathing, Shortness of breath, chest pain or pressure loss of speech or movement.

Patient screening and triage -

Patients who present with fever and respiratory symptoms with an epidemiological link to COVID-19 should carry a high index of suspicion for the disease. The epidemiological link may involve-

- travel to an area that experienced an

outbreak,

- Close contact with an individual with a confirmed or high risk of infection, or
- Close contact with an individual with respiratory symptoms who had been in a geographic location that witnessed an outbreak within a 14-day period prior to the onset of symptoms. As the geographic area of involvement is expanding, clinicians need to keep themselves updated on the list of affected countries and territories. Following several generations of spread with a country, local transmission of disease occurs, and patients may present with no history of travel to a location with a known outbreak.

Critically ill patients may present to the emergency department from the community or by inter-hospital transfer to the intensive care unit. In such instances, a detailed inquiry should be carried out to ensure appropriate screening and infection control precautions should be followed.

How to get tested for Coronavirus?

In case person feel your symptoms are specific to the coronavirus, there healthcare provider can get in touch with CDC or the local healthcare departments for testing instructions. There are specific labs set up for conducting coronavirus tests, so they may be directed to one of these labs.

There are different types of coronavirus tests that can be done:

- Swab Test – In this case, a special swab is used to take a sample from your nose or throat
- Nasal aspirate – In this case, a saline solution will be injected into your nose and, then a sample is taken with a light suction
- Tracheal aspirate – In this case, a thin

Individual role in prevention of covid-19

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Abstract -

Pulmonary illness coronavirus disease 2019 (COVID-19) causes illness that are known to cause common cold to more severe diseases. In the present article detection, prevention, response and control measures are collected from online sources of information. Aim of the present paper is to help people unknown about covid-19 to save an individual health and life which will lead nation building.

Key words - COVID-19, corona virus, pandemic, sanitizer, social distance.

Introduction -

In the relatively short period of time coronavirus was identified as COVID-19. The first case of coronavirus pandemic in India was reported on 18th march 2020 at Delhi airport.

COVID-19 is a disease caused by a new strain of coronavirus. "CO" stands for Corona "VI" for virus and "D" for disease. Formerly this disease was referred as '2019 novel coronavirus' or '2019-nCoV'.

This virus can have the range of symptoms in patients' bodies, ranging from mild illness to pneumonia. Symptoms of this disease are fever, cough, sore throat and headache.

In the last 20 years several viral epidemics such as the several acute respiratory syndrome coronaviruses. The novel Coronavirus (COVID-19) cases have been confirmed in a large number of countries due to which the World Health Organization (WHO) on 11 March 2020 has characterized covid-19 as pandemic.

Clinical recovery for mild cases is approximately 2 weeks and is 3 to 6 weeks for patients with severe or critical disease.

One can recover from Coronavirus disease (COVID-19). Patients can recover and eliminate the virus from their bodies.

Total duration of quarantine period for

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coronavirus (COVID-19) is 14 days.

Covid-19 causes only mild illness at beginning. It can also make some people very ill and more severely the disease can be fatal for older people and don't wait pre-existing condition such as high blood pressure, heart problem, or diabetics to be more vulnerable.

When shall we do covid-19 test?

- If you have symptoms like flu, you can isolate yourself.
- If you infected with covid-19 you become tired for two days.
- Then on third day it converts into mild fever, throat irritation and upping.
- At the fourth day mild headache.
- At the fifth day indigestion, constipation and loose motion, headaches like symptoms appear.
- At the sixth- and seventh-day body pains increases and other symptoms reduces.
- At 8th and 9th day cough and cold increases with difficulty in breathing.
- It is a good symptom of immunity developed against covid-19, but if few symptoms remain then you should have to proceed towards Corona helpline for test of covid-19

(Professor Dr. Farokh Udawadia, Breach Candy Hospital Mumbai).

Individual Roll in prevention of Corona virus infection -

Even after lockdown is lifted, everybody individually has to take following all precautions

- 1) One must use mask.
- 2) Hand sanitization
- 3) Keep social distance
- 4) Don't go out unless it is absolutely necessary
- 5) Don't grow beard
- 6) Don't go to barber shop. Either shave

The COVID-19 and Education System: Impact And Strategy

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Abstract -

Due to COVID-19 and lockdown situation various sectors of India like agriculture, textile, automobiles, aviation, retail, telecom, etc. are badly affected. The education sector is the central backbone of Indian economy and development, now facing an unprecedented crisis due to Corona Virus Disease (Covid-19). Next to China Indian education system, which is the most diverse and largest in the world with 1.3 million schools, 39931 colleges, 993 universities and 10725 Stand alone institutions as per report of the Ministry of Human Resource Development, Government of India. The outbreak of Coronavirus has advised us that change is inevitable. Quick major actions are essential to ensure continuity of learning in education sectors. The present study is aimed to find out the impact of coronavirus on education system in India and strategies to mitigate its negative impacts.

Keywords - Lockdown, Corona Virus Disease (Covid-19), Higher education, Strategy.

Introduction -

The COVID-19 is pandemic, so many countries have decided to close schools, colleges and universities to reduce contact, stop spreading of novel corona virus and save lives. There is no certainty when schools and colleges will reopen. One of the first measures taken by the Indian government was to close the educational institutions for the safety of students, teachers, and their families. No doubt, the steps were taken by the government were necessary and brought in the right direction to stop the further spread of the virus in the country. Social distancing and severe lockdowns across the globe has forced students to find innovative ways to do their education and study. According to UNICEF (United Nations International Children's Emergency Fund) monitoring, 186 countries are currently implementing nationwide closures and 8 are

implementing local closures, impacting about 98.5 percent of the world's student population (UNESCO, 2020).



Map showing World countries lockdown(Education)

On 16 March, India declared a countrywide lock-down of schools and colleges. The global closedown of educational institutes is going to cause major interruption in learning of around 600 million students across the world. Mandatory school closures and other social distancing measures were associated with a 29% to 37% reduction in influenza transmission rates (NIH, US, 2011). This is challenging time for educational fields such as school, colleges and universities to conduct board examinations, competitive examinations, various entrance test, term end examinations, etc. During lockdown period students are attending regular online classes and completing assignments and preparing for online exams at home. Students have fewer opportunities for learning at home, and their time out of school may present economic burdens for parents. According to Bjorklund and Salvanes (2011), families and parents play a major important role into a child's learning, but this role is complementary to teachers and it is less effective. According to the Organization for Economic Co-operation and Development (OECD) studies, school performance hinges critically on maintaining close relationships with teachers. This is particularly true for students from disadvantaged backgrounds, who may not have the parental support needed to learn on their own. During the 1918-1919 influenza pandemic in the United States, school closures and public gathering bans

Covid-19 Pandemic Prevention in Schools and Caregivers

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Abstract -

COVID-19 is a zoonotic disease. Outbreak of COVID-19 has been declared as a pandemic by WHO and the virus has now spread across many countries and territories. To reduce the impact of the outbreak and support for control measures, many countries choose to lockdown the nation from 2/3 months. Some countries started to open the lockdown partially. As per as schools and colleges are concerned, to protect students, teachers, caregivers some precautions and extra facilities are necessary i.e. keeping social distancing to provide hand wash/ sanitizer, unnecessary touching, facilities like e-learning, prohibition of unnecessary gatherings. So that we can protect the young students to whom we address global citizens. All these measures must be useful to diminish the students' fear and anxieties about COVID-19.

Keywords - COVID-19, pandemic, lockdown, students, prevention, schools, colleges, etc.

Introduction -

The majority of human infectious diseases and Pandemic are originated through the cross species transmission of microorganisms from animal to humans, overwhelmingly in the Old World (Jane, K. E. et al., 2008; Taylor, L. H. and Latham, S. M. 2001, Wolfe, N. D. et al., 2007). However, most of the animal pathogens are not readily transmitted to humans (Antia, R. et al., 2003). The process of cross species transmission is not fully understood. To become successful human pathogen an animal pathogen must evolve into a pathogen capable of not only infecting humans, but maintaining long term human to human transmission without the need for reintroduction from the original animal host. This process can be categorised into stages (Wolfe et al., 2007).

Stage1 - Involves animal microbes that are not present in humans under natural conditions,

when a pathogen evolves, it can be transmitted to a human under natural condition, it has entered.

Stage 2 - Transmission from stage 2 into stage 3 is defined by secondary transmission between humans.

Stage 3 - Includes pathogens that undergo only few cycles of secondary transmission between human whereas,

Stage 4 - Includes disease that exist in animals but which undergo long sequences of secondary human to human transmission without involvement of animal hosts.

Stage 5 - Represents diseases that are exclusive to humans. History's most troublesome disease is in stage 5. (Wolfe et al., 2007)

As we increase our interactions with animals through hunting, the trading of animal foods, animal husbandry practice, wet market and domestications of animals, the probability of infection transmission dramatically increases. It is now accepted that the hunting of nonhuman primates in the early 20th century led to the introduction of simian immunodeficiency virus into the human population, giving modern HIV pandemic. (Worobey et al., 2008)

The SARS outbreak originated from the bat of the genus *Rhinolophus* and its human emergence is believed to have been facilitated through intermediate hosts in the wet markets of Southern China (Webster, R. G., 2007) and (Wan, L. F. and Eaton, B. T., 2007). The species of animal that harbour the pathogen, the nature of human interaction with that and the frequency of these interactions modulate the risk of zoonotic transmission (Wolfe, N. D., 2007). The success of a pathogen depends on its ability to spread from human to human and susceptible to human population, our ability to cross continents in a single day poses a unique new challenge to emerging infection disease control. Past research has

Traditional Methods to Reduce Stress and Anxiety

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Abstract -

Stress is a normal reaction the body has when changes occur. The body reacts to these changes with physical mental and emotional responses. Stress is a normal part of life. Stress can be positive keeping us alert, motivated and ready to avoid danger, it may be negative when a person faces continuous challenges without relief or relaxation between stressors. This stress response is “fight or flight response”. Stress can be reduced by a positive attitude, be assertive instead of aggressive. Learn and practice relaxation techniques such as asana, pranayama and meditation. Enough rest can reduce stress.

Key Words - Stress, anxiety, asana, pranayama, meditation and OM chanting, etc.

Introduction -

Stress - The body’s reaction to any change that requires an adjustment or response is stress or Stress is any demand placed on your brain or physical body. The body reacts to these changes with physical, mental and emotional responses. It is a normal part of life. We can experience stress from our environment, our body and our thoughts. Even positive life changes such as a promotion, a mortgage, or the birth of a child also produce stress. People can report feeling stressed when multiple competing demands are placed on them. The feeling of being stressed can be triggered by an event that makes you feel frustrated or nervous. Anxiety is a feeling of fear, worry, or unease.

In the human being life stresses are due to the death of a loved one, divorce, loss of a job, increase in financial obligations, getting married, moving to a new home, chronic illness or injury, emotional problems (depression, anxiety, anger, grief, guilt, low self-esteem), etc. but nowadays whole world facing stress and anxiety due to

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the COVID-19 pandemic which is also known as the coronavirus pandemic, is an ongoing pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The outbreak was identified in Wuhan, China, in December 2019. The World Health Organization declared the outbreak a Public Health Emergency of International Concern on 30 January and a pandemic on 11 March. As of 10 May 2020, 40,26,691 cases of COVID-19 have been reported in over 212 countries and territories, resulting in 2,76,894 deaths. 5,79,509 people have recovered. In India 62939 cases of COVID-19 have been reported from which 19358 people have recovered and resulting in 2109 deaths. These numbers increase continuously, which causes stress and anxiety.

The warning signs of stress - Dizziness or a general feeling of “being out of it.”, General aches and pains, Grinding teeth, Headaches, acid reflux symptoms, Increase in or loss of appetite, muscle tension in the neck, face or shoulders, Problems of sleeping, Racing heart, Cold and sweaty palms, Tiredness, exhaustion, Trembling/shaking, Weight gain or loss, Upset stomach, diarrhea, Sexual difficulties, etc. are the various physical symptoms due to the chronic stress which can wear down the body’s natural defenses.

Stress Effect on Health - The human body is designed to experience stress and react to it. Stress can be positive or negative. Positive stress keeping us alert, motivated and ready to avoid danger. When in negative stress a person faces continuous challenges without relief or relaxation between stressors. As a result, the person becomes overworked and stress-related tension builds. The body’s autonomic nervous system has a built-in stress response that causes physiological changes to allow the body to combat stressful situations.

Responsibility of Individual in prevention of Corona virus infection

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Abstract -

The outbreak of corona virus disease 2019 (COVID-19) has undoubtedly affected the whole world and has created a global health crisis that has had a deep impact on the way we perceive our world and our everyday lives. Not only the rate of contagion and patterns of transmission threatens our sense of agency, but the safety measures put in place to contain the spread of the virus also require social distancing. On 30 January 2020, the WHO Director-General determined that the outbreak of coronavirus disease (COVID-19) constitutes a Public Health Emergency of International Concern. As the outbreak continues to evolve, Member States are considering options to prevent introduction of the disease to new areas or to reduce human-to-human transmission in areas where the virus that causes COVID-19 is already circulating. India has also reported cases from states and the government is trying to contain the spread of the disease. The purpose of this paper is to discuss what is social distancing Quarantination individual role, medical, health, food, supplies, precaution to taken in controlling spread of this diseases.

Keyword - Coronavirus, COVID-19, Individual, Quarantine, WHO

Introduction -

Corona viruses are a large family of viruses which may cause illness in animals or humans. In humans, several coronaviruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The most recently discovered coronavirus causes coronavirus disease. It is the infectious disease caused by the most recently discovered corona virus. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019.

The most common symptoms of COVID-19 are fever, tiredness, and dry cough. Some patients may have aches and pains, nasal congestion, runny nose, sore throat or diarrhea. These symptoms are usually mild and begin gradually. Some people become infected but don't develop any symptoms and don't feel unwell. Most people (about 80%) recover from the disease without needing special treatment. Around one out of every six people who gets COVID-19 becomes seriously ill and develops difficulty breathing. Older people and those with underlying medical problems like high blood pressure, heart problems or diabetes are more likely to develop serious illness. People with fever, cough and difficulty breathing should seek medical attention.

People can catch this virus from others who have the virus. The disease can spread from person to person through small droplets from the nose or mouth which are spread when a person with COVID-19 coughs or exhales. These droplets land on objects and surfaces around the person. Other people then catch virus by touching these objects or surfaces, then touching their eyes, nose or mouth. People can also get it by breathing in droplets from a person with COVID-19 who coughs out or exhales droplets. This is why it is important to stay more than 1 meter (3 feet) away from a person who is sick.

What is social distancing and why is it important?

Social distancing refers to actions taken to stop or slow down the spread of a contagious disease. For an individual, it refers to maintaining enough distance (6 feet or more) between yourself and another person to avoid getting infected or infecting someone else. School closures, directives to work from home; library closings, and cancelling meetings and larger events help enforce social distancing at a community level.

Impact of COVID-19 Related Lockdown on Behavior of Birds.

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On 24 March 2020, the Government of India under Hon'ble Prime Minister Narendra Modi ordered a nationwide lockdown for 21 days, restricting movement of the entire 1.3 billion population of India as a protective measure against the COVID-19 pandemic in India¹. It was ordered after a 14-hour voluntary public curfew on 22 March, followed by enforcement of a series of regulations in the country's COVID-19 affected regions.^{2,3} The lockdown was placed when the number of confirmed positive coronavirus cases in India was approximately 500.¹ Hon'ble PM said that the only solution to control the spread of coronavirus was to break the cycle of transmission through social distancing.⁶ He also added that the lockdown would be enforced more strictly than the Janata Curfew.⁷

The lockdown had slowed the growth rate of the pandemic by 6 April to a rate of doubling every six days,⁴ and by 18 April, to a rate of doubling every eight days.⁵ The Government of India confirmed India's first case of Coronavirus disease 2019 on 30 January 2020 in the state of Kerala, when a university student from Wuhan travelled back to the state.¹³ COVID-19 related lockdown has diversified effects on plants, animals and ecosystem as well.

The nationwide lockdown that brought 1.3 billion people to a stop has apparently caused positive changes in the environment, at least temporarily. Skies are clearer and river water seems cleaner.⁸ Air pollution has dropped to unprecedented levels across the world as major cities and countries impose lockdown measures to curb the spread of the coronavirus.⁹

The study of the effect of COVID-19 Lockdown seems to have a positive impact on animals and birds. It is a lockdown for people, but freedom for birds and animals, while humans stay in during lockdown, animals, birds reclaim spaces.

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Reduced human interference and decreased pollution level in the environment in India have led to reclaim their space in the ecosystem up to certain extent. Many migratory bird species which migrate from other parts of the world have extended their stay in India. The nesting behavior, availability of food, comfortable water bodies are some of the reasons that affected the lengthening of their stay over here in India. The negative effect also visible due to non availability of food to some birds like pigeons.

Restricted human intrusion and reduced pollution levels have helped the birds reclaim their space in the ecosystem up to certain extent

A report from Kerala revealed that many bird species which migrate from other parts of the country known as partial migratory birds have now extended their stay at the Therthangal and Melaselvanoor - Keelaselvanoor bird sanctuaries.¹⁰ This information is elaborated by Ramanathapuram Forest Range Officer S. Sathish. He further stated that, "Usually, species like open bill stork, spot-billed pelican, painted stork, grey heron, spoonbill and ibis depart from here by March. However, this year, they have extended their stay, thanks to the lockdown," he also added "A good northeast monsoon and comfortable storage in water bodies across the district had led to an increase in the nesting of birds in these two sanctuaries during the last season," he says. Forest department officials released fingerlings into water bodies last year. The tanks and feeder channels were desilted to ensure that there was good water storage.

The another report from Bijnor indicates that with flutter of wings migratory birds lifted their tiny frames into the air, one after the other, stirring the still water of the lakes in Terai region of northern plains.¹¹ There was no traffic around to drown the din, and to fill the void left by their departure. As

लॉकडाउननंतर 'लग्ने' ठरु नयेत विघ्ने

एल. जे. गवळी

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प्रस्तावना -

कोरोना लॉकडाउनमुळे काही सकारात्मक गोष्टी -

१. ५४/५५ दिवसात व्यसनी लोकांचे व्यसन अनायसे थांबले.
२. गंगा, तापी, गोदावरी, नर्मदा इ. नद्या अत्यंत स्वच्छ झाल्या.
३. स्त्रीयांवरील अत्याचार ०% वर आले व रोडावरचे अपघात बंद झाले व गुन्हेगारी थांबली.
४. सधन विद्यार्थी या लॉकडाउनच्या काळात स्मार्टफोन माहिती तंत्रज्ञानाचा वापर, यु-ट्यूब, ई-लायब्ररीच्या माध्यमातून शिक्षणाची भुक भागवीत आहे. एकीकडे आदिवासी पट्ट्यातील असंख्यविद्यार्थी स्मार्टफोन दुरच पण साधा मोबाइलही नसल्याने शिक्षण हक्कापासून वंचित आहेत
५. लग्नांमध्ये होणारा अवाढव्य खर्च थांबला. इथून पुढे हीच परंपरा रुढ व्हायला हवी. यात माणूस कर्जबाजारी होणार नाही.
६. लोकांचा पीझा, बर्गर, सोयाबीनचील्ली, मंच्युरियन, फ्रास्टफूड इ. आहार चक्र बंद करून लोक घरातीलच अन्न खाण्यात धन्यता मानायला लागले.
७. शरीराला किती तरी ड्रेसांची आवश्यकता नसून मोजकेच कपडे लागतात. याचे आत्मभान आले. स्त्रीयांचा ब्यूटीपार्लरचा पैसा वाचला.
८. ७०% आजरांना औषध उपचारांची गरज नसते. ते घरगुती उपयांनीच बरे होऊ शकतात याची खात्री झाली.
९. आत्मविश्वास, इच्छाशक्ती, योग्य व्यायाम, योग्य उपचार आणि मानसिक संतुलन, योग्य आहार घेतला तर पेंशट ठणठणीत बरे होतात याचा प्रत्यय आला.
१०. बाळ जन्मल्यानंतरचा बारश्याच्या खर्च व माणूस मेल्यानंतरचा 'उत्तरकार्यविधी' देखील खर्चीक न करता मर्यादीतच करावा.

११. पोलीसबंधु, पोलीसभगिनी, सरकारी डॉक्टर, खाजगी डॉक्टर, परिचारीका/नर्स, आरोग्यकर्मचारी, सफाई कर्मचारांचे ५४/५५ दिवसातील योगदान तमाम जनता विसरणार नाही याचे भान आले.

१२. तमाम जनतेने श्रीमंत, गरीब, वैभव, सत्ता संपत्तीचा कुठलाही मिजास न बाळगता लॉकडाउनच्या काळात जुळालेली लग्ने नो बस्ता, नो हळद, नो मंडप, नो घोडा, नो वऱ्हाडी, नो पंगत, नो रुसवा, नो फुगवा अशा स्वरूपात करावीत. कारण 'लॉकडाउन नंतरच्या काळातील लग्ने ठरु नयेत विघ्ने'.

तमाम भारतवासीयांनो आपणास माझा घरात बसल्या बसल्या शारीरिक आंतर ठेऊन नमस्कार! बंधुनो समोरचा अदृश्य शत्रु आपल्यावर चाल करून येत आहे. त्याचे कर्तव्य तो निभावत आहे. आपण घरातच लॉकडाउन केल्यामुळे बऱ्यापैकी सुरक्षित राहण्याचे क्रेडिट देशाचे पंतप्रधान मा. मोदीसाहेब व महाराष्ट्राचे मुख्यमंत्री मा. उद्धवजी ठाकरे साहेब यांच्या कडेच जाते. अश्या नीटनेट्क्या नियोजनपूर्वक यशस्वितेकडे वाटचाल करीत असतानाच आपण इतर देशातले चित्र पाहिले तर चिन, वूहान, अमेरिका, फ्रान्स, इटली, जपान, येथे पिकांवरील कीटक फवारणीने जसे हजारोने पटापट मृत्यू पावतात तशा पद्धतीने माणसांची प्रेते दिसत आहेत. प्रेतांचा अंत्यसंस्कार देखील कोरोनाच्या लागणला घाबरून रुढी परंपरेने केला जात नाही. इतके दुर्दैव आहे. बाप मेला तर पत्नी व मुलगा देखील त्या बापाच्या किंवा पतीच्या प्रेताशेजारी येवू शकत नाही. भाऊ वारला तर बहीण भावाचे शेवटचे अंत्य दर्शन - निव्वळ चेहरा बघू शकत नाही. आईचा चेहरा मुलगी पाहू शकत नाही. मुलीचा चेहरा जन्मदात्री आई पाहू शकत नाही. भाऊ भावाचा चेहरा पाहू शकत नाही. प्रेताची दुर्गंधी बाहेर येवू नये म्हणून प्लास्टिकच्या कितीतरी पदरी वळकटीत प्रेत बंदीस्त करण्यात येते. अंत्यविधीला ४-५ माणसांनी अंत्यविधीच्या वेळेस प्रेत जाळण्यात येते. इतकी काळजी घेतली तरच घरातील इतर माणसे वाचू शकतात. एवढी दहशत कोरोनाची आहे. अशा या भयावह यम-यात्रेत आपण चुकून कोरोनाच्या

कोव्हीड-१९ साथरोगासंबंधी टाळेबंदीचा परिणाम : सद्यस्थिती व भविष्यकाळ

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‘कोव्हीड-१९’ कोरोना व्हायरस या साथरोगाच्या विषाणूने सर्व जगाला वेढले आहे. थैमान घातले आहे. संपूर्ण जग या समस्यापुढे हतबल आणि भयभीत झाले आहे. त्यामुळे भारतात अनेक दिवसांपासून टाळेबंदी (लॉकडाऊन) करावी लागली आहे. या टाळेबंदीचे परिणाम मानवी जीवनाला अस्वस्थ करणारे जीवघेणे आहे. बेचैन करणारे आहेत. अमेरिका, जपान, जर्मनी, इटली, स्पेन, ब्राझील, चीन यासारखे बलाढ्य देशांची दैना उडाली आहे. त्यातल्या त्यात पडत असलेल्या माणसांच्या मृत्युमुळे फार हादरून गेले आहेत. हातबल झाले आहेत. ही परिस्थिती नष्ट करण्यासाठी तिचा अटकाव करण्यासाठी सर्व स्थरातील पातळीवरून प्रयत्न चालू आहेत; परंतु आजपावेतो कोणत्याही देशाने त्यावर अजून तरी औषध शोधून काढले नसल्यामुळे आज घडीला कोरोनाचे आव्हान महाभयंकर जगासमोर उभे ठाकले आहे. शासन, डॉक्टर, नर्स, पोलिस, सफाई कामगार हे जीव धोक्यात घालून कोरोनाच्या लढ्यात कार्य करित आहेत. कोरोना व्हायरसपासून सगळ्यांना वाचवणे त्याचबरोबर ज्यांना ज्यांना ह्याची लागण झाली आहे अशांना वैद्यकीय सेवा पुरवून त्यांना कोरोनामुक्त करणे हेही महत्त्वाचे देशापुढे, जगापुढे आव्हान आहे.

अर्थव्यवस्थेवर परिणाम -

जगात जे विकसित देश आहेत/होते. राष्ट्र आहेत/होती. सद्यस्थितीत ती फार कोलमडून गेली आहेत. त्यांची अर्थव्यवस्था मोडकळीस येत आहे. आरोग्य आणि अर्थव्यवस्था याबाबतचे नियोजन कसे करायचे हे समजेनासे झाले आहे. संयुक्त राष्ट्र संघानेही जगाचे काय होईल याबाबत जगाची चिंता व्यक्त केली आहे. कोरोना व्हायरस इतका भयंकर असेल त्याचा फटका इतका जोरदार बसेल असे कोणत्याही देशाला वाटले नव्हते असे मत युनोने नोंदवले आहे. संपूर्ण जगालाच या कोरोना व्हायरसचा सामना करावा लागत आहे. कोरोना व्हायरसमुळे विविध प्रश्न समोर आले आहेत. मानवी जीवनाच्या मुलभूत गरजेचा प्रश्नही ऐरणीवर आला आहे. याविषयी डॉ. विजयकुमार वावळे म्हणतात की, या व्हायरसमुळे अर्थव्यवस्थेतील मजुरामध्ये दारिद्र्य आणि बेरोजगारीरूपी बसणारा फटका याला आपल्याकडे कोणतेही उत्तर असणार नाही. जगभरात तसेच भारतातही कोरोना

व्हायरसमुळे आरोग्य आणि अर्थव्यवस्था या दोन्ही क्षेत्राचा फज्जा उडाला आहे. वास्तविक पाहता अर्थव्यवस्थेचे हे मूलभूत प्रश्न आणि विशेषतः मजूर आणि त्यांना भेडसावणार्या विषमतेच्या झळा किमान कोरोनाच्या साथीमुळे का होईना जगाच्यासमोर आल्या.

आरोग्यावर परिणाम -

इटली, अमेरिका, स्पेन, ब्राझील अशा देशांमध्ये या कोरोना व्हायरसमुळे जीवित हानीही खूप मोठ्या प्रमाणावर झाली आहे. त्यामुळे माणसं भयभीत झाली आहेत. त्यावर अजूनही औषध शोधणे सुरू आहे. औषध निर्माण करणाऱ्यावर ते एक प्रकारचे चॅलेंज निर्माण झाले आहे. हा महाभयंकर प्रश्न सर्व जगासमोर निर्माण झाला आहे. आपण भारताचा विचार केला तर भारत देशातील संशोधन पाहिले तर ते फार उपयोगाचे आहे किंवा शासनही त्याकडे फार लक्ष देते आहे असे नाही त्यामुळे आपल्या देशाच्या विकासाच्या दृष्टीने आणि आरोग्याच्या दृष्टीने शासनानेही विचार करणे गरजेचे आहे. याविषयी डॉक्टर नागनाथ कोत्तापळे म्हणतात की, कुठल्याही शास्त्राचा विकास संशोधनातून होतो. दुःखाची गोष्ट अशी की, भारतामध्ये वैद्यकीय ज्ञानशाखेत होणारे संशोधन नगण्य आहे. आज ज्या ज्ञानाचा वापर होतो त्यात भारतीय तंत्रज्ञानी किती भर घातली असा प्रश्न केला तर उत्तर शून्य असेल. तसेच ज्या औषधांचा वापर होतो त्यातील बहुसंख्य औषधी बाहेरच्या तज्ञांनी शोधलेली आहे त. साधी मलेरियाची ‘क्विनाइन’ ही गोष्टीही पाच्छत्यांनी शोधलेली विकसित केलेली. म्हणजे वैद्यकशास्त्र असो औषधनिर्माण शास्त्र. भारतामध्ये त्या क्षेत्रात अगदीच संशोधन होते.

मानसिक अस्वस्थता -

सध्या लॉकडाऊनच्या काळात अत्यंत वाईट परिस्थिती अनुभवायला येत आहे. लॉकडाऊनच्या काळातील समाजाची, माणसाची परिस्थिती भयावह आहे. अत्यंत विषम आणि विदारक असे चित्र दिसते आहे. यामध्ये गृहकलह, घटस्फोट, एकाकीपणा, भीती, नाराजी, नैराश्य अशा गोष्टींचे प्रमाण वाढत आहे. दारिद्र्य वाढत आहे. त्याचबरोबर समाजातील ही अस्थिरता निर्माण झाली आहे. माणसांना खायला मिळत नाही. माणसं माणसापासून दूर जात आहेत.

कोरोना महामारी लॉकडाउनमुळे शेतीक्षेत्रात आर्थिक वर्तमान व भविष्यकालीन परिणाम

शांताराम ताराचंद सोनवणे

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प्रस्तावना -

भारत हा कृषीप्रधान देश आहे. ६५ ते ७०% लोक शेतीवर अवलंबून आहेत. आपल्या देशाची संस्कृती महान आहे. भारतीय संस्कृती ही मुलता: कृषी संस्कृती आहे. शेती व शेतकरी यातून ती विकसित झाली आहे. शेतकरी हा भारतीय समाजाचा सततचा प्राणवायु सांस्कृतिक घटक आहे. पंचभुता बरोबर शेतकऱ्याच्या श्रमाची एकरूपता होवून पोषक हिरवाई उदयाला आली. निसर्गाला कंठ फुटला, पंचमहाभुतांना सन्मान मिळाला. श्रमानेच ईश्वरविषयाची श्रद्धा जागवली. शेतकऱ्याने या धरतीमातेला वसुमती बनवले आहे. अशा प्रकारे भारतीय तत्वज्ञान शेतकऱ्यांच्या जगण्यातून श्रमातून उदयाला आले.

मानवी जीवनाबरोबर अनंत डोळ्याला न दिसणारे सुक्ष्म जीवहि धरतीमाता प्रत्येक सुक्ष्म जीवाला जगण्यासाठी विविध प्राण्यांच्या शरीरातजगण्याचा अधिकार हासुद्धा निसर्ग नियमच आहे. अर्थात यालाच तर सहजीवन म्हणतात. सर्व जीवसृष्टी जगच आहे. मानवीनिसर्ग हस्तक्षेपामुळे मानवामुळेच मानवावर संकट ओढवली आहेत. याचाच परिणाम जगबंद ७०० कोटि लोकसंख्या असणारी हि धरती माता आज केवळ एका प्राण्यांमधील एका व्हायरसमुळे बंद आहे. तो व्हायरस म्हणजे कोरोना (कोविड- १९) व्हायरस यापूर्वी ही मानव जात अस्तित्वात आल्यापासून आजपर्यंत हजारोवेळा अनेक प्रकारच्या रोगांच्या साथी येवून गेलेल्या आहेत. मानवाने त्या सर्वांवर मात करित आत्तापर्यंतचा प्रवास केलेला आहे.

जगावर असे अनेक संकट येवून गेली आहेत. त्यात १७२० मध्ये मार्सि लेप्लेग (Marshile Plague) नावाचा आजार येवून गेला. त्यात जगभरात ७ करोड जवळपास लोक बळी गेले होते. पुन्हा १८२० मध्ये भयानक महामारी उेश्रीर ह्या भयानक रोगाची प्रथम सुरवात बांग्ला देशातून झालेली होती, तर फैलाव थायलंड, इंडोनेशिया, फिलीपाईन, मध्य व पुर्व अफ्रीका, युरोप, रूस देशात हा रोग पसरलेला होता. यात सुमारे ८ लाख लोक बळी पडले होते. पुढील काळात १९२० मध्ये स्पैनिश फ्लु नावाचा भयानक व्हायरस नावाचा आजार आला. स्पेन या देशात हा आजार प्रखर तीव्र असल्यामुळे याला स्पैनिशफ्लु नाव पडले. ही महामारी युरोप, युनायटेड स्टेट आणि आशियाच्या काही भागात पसरला होता. यात

वाल्मिक भाऊराव शिरसाठ

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जवळपास ५ करोड लोकांचा बळी गेला होता. या जागतिक महामारी आजाराने भारतातील जवळपास २ करोड लोकांचा बळी गेला होता.

आज डिसेंबर २०१९ पासून कोरोना व्हायरस (कोविड- १९) या जागतिक महामारीची सुरवात सर्वप्रथम चीनमधून सुरुझाली. अन अत्यंत जलदगतीने हा भयानक संसर्गजन्य व्हायरस जगभर हाहा म्हणता वाऱ्यासारखा पसरला. यामुळे सर्व जगाचे व्यवहार, दळणवळण थांबून अर्थव्यवस्था ठप्प झाली. ह्या आजारावर नियंत्रण मिळवण्यात अद्याप कोणत्याही देशाला यश मिळालेले नाही. परिणामी हतबल व भयानक तीव्रता पाहता सर्व देशात डेल्टावेपु च अंमल करण्यात आला. यामुळे ह्या आजाराच्या वाढत्या प्रादुर्भावामुळे जागतिक अर्थव्यवस्था कोलमडून पडली.

कोरोना व्हायरस (कोविड - १९) सुरवात -

२०१९ मध्ये कोरोना व्हायरसचा एक उपप्रकार चीनमधील वूहान शहरात आढळून आला. याला कोव्हिड-१९ असे नाव देण्यात आले. सुरुवातीस वुहान व आसपासच्या प्रदेशात पसरलेला हा विषाणू त्याच्या इतर उपप्रकारांपेक्षा अधिक तीव्रतेचा असून याने रोग्यांच्या मरण्याचे प्रमाण मोठे आहे. १३मार्च२०२० अखेर जगात १,३२,७५८ जणांना या आजाराची लागण झाली असून एकूण ४९५५ जणांचा मृत्यू झाला आहे. एकूण १२२ देशांमध्ये हा आजार पसरला आहे. चीनमधील हूबै प्रांतात या आजारामुळे सर्वाधिक बळी गेले आहेत. हूबै प्रांतातील वूहान शहरातून या विषाणूची लागण सुरू झाली. या आजारामुळे चीन देशात १३ मार्च २०२० अखेर ३१८० जणांचा बळी गेला असून ८० हजार ९९१ जणांना लागण झाली असल्याचे समोर आले आहे. जागतिक आरोग्य संघटनेने याबाबत माहिती जारी केली आहे. ६ एप्रिल २०२० अखेर जगात एकूण १२,१०,९५६ जणांना या आजाराची लागण झाली असून एकूण ६७,५९४ जणांचा मृत्यू झाला आहे. यापैकी युरोपीय देशांत ४९,४७९ तर अमेरिकेत ९,६८० मृत्यू झाले आहेत. ११ मे २०२० चे आकडेवारीनुसार जगभरात ही रुग्णसंख्या ४१,८६,८४१ तर मृत्यू २,८८,५ ६५ जगभरात बरे झालेल्या कोरोना व्हायरस रुग्णांची संख्या १४,१९,८९४ इतकी आहे. ह्या आकडेवारीत भर ही जागतिक चिंतेची बाब आहे...

CUSO₄- and ZNSO₄-Induced Histological Alterations on Alimentary Canal of Earthworms Species *Eudrilus eugeniae*

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ABSTRACT This study was conducted to determine the effects of heavy metals or micronutrients such as CuSO₄ and ZnSO₄ in the alimentary canal of epigeic earthworm species *Eudrilus eugeniae*. By considering the LC₅₀ values of CuSO₄ and ZnSO₄, lower (1/4th) and higher (3/4th) sublethal doses were calculated. The earthworm species *E. eugeniae* were exposed for 30 days continuously to these two contaminants. The experiment was conducted in triplicate for each dose. At the end of the experiment, the tissues were collected for histology and microtomy was performed. Higher sublethal doses of CuSO₄ and ZnSO₄ were found to cause deleterious effect on histology of alimentary canal. CuSO₄ found to causes more damages than ZnSO₄. Similarly, lower sublethal doses of both CuSO₄ and ZnSO₄ contaminant did not show deleterious effects on tissues. Histological end points are very important in toxicity study. Therefore, it is exceptionally fundamental to do such investigations which and watched patterns could be taken as an early notice to the dangers of substantial metal contamination on epigeic worms.

KEY WORDS Alimentary canal, Alteration, CuSO₄, *Eudrilus eugeniae*, Histology, Sublethal, ZnSO₄



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मराठी विभागप्रमुख, कर्मा. आ. मा. पाटील वरिष्ठ महाविद्यालय, पिंपळनेर ता. साठी जि. पुणे.

भारताला स्वातंत्र्य देण्याची घोषणा ब्रिटिश सरकारने १६ मे १९४६ रोजी केली. देश दुर्भंग नये देशात यावळामांथळ निर्माण होऊ नये म्हणून देशाला घटनेची गरज असते. त्यावेळेपासून घटनेच्या संदर्भात चर्चा सुरु झाली. भारतीय संविधान समितीची रचना १९४६ सालीच केली. त्या समितीमध्ये एकूण दोनशे तीन सदस्यांची नेमणूकी केली. त्यातील अनेकांना संविधानाच्या संदर्भातील ज्ञान नव्हते. डॉ. बाबासाहेब आंबेडकरांनी याबाबतील नाचती नव्हते. त्यांच्या पक्षातील लोकही निवडून आले नव्हते. परंतु या समितीमध्ये डॉ. बाबासाहेब आंबेडकर यांचा समावेश कावा असे त्यांना वाटत होते. अनेकजण तर डॉ. बाबासाहेब आंबेडकर यामध्ये येऊ नयेत म्हणून कसोशावे प्रयत्न करत होते. याबाबत ज. वि. पवार म्हणतात की, "समदार वल्लभाई पटेल यांनी तर जाहीरपणे सांगितले की, "आम्ही कोणत्याही परिस्थितीत डॉ. बी. आर. आंबेडकर या समितीत यावे असे वाटत होते त्या अनेकांपैकी जोगेंद्रनाथ मंडल हे एक होते. जोगेंद्रनाथ मंडल यांनी डॉक्टर बाबासाहेब आंबेडकरांचा त्यांच्या मतदार क्षेत्रात उमेदवारी दिली व निवडूनही आणले. पुढे हा मतदारसंघ फाळणीनंतर पाकिस्तानात गेला त्यामुळे बाबासाहेबांचे स्वप्न पुन्हा धुळीस मिसळले. पुढे निजयाल्ल्मीबाई पंडित ह्या सर आयक्टर जेजिंग यांना घटना लिटुन देण्यासंदर्भात भेटल्या. परंतु त्यांनी नकार दिला व ते म्हणाले, तुमच्या देशांमध्ये हे संविधान लिहिण्यासाठी तीन बरिस्टर आहेत. त्यांनी बरिस्टर तेजबहादुर सभु, बरिस्टर एम. आर. जयकर व बरिस्टर जी. आर. आंबेडकर यांची ताबेही सांगितली. या घटना तज्ञांना पंडित नेत्रहंजी भेटल्यानंतर त्यातील दोघांनी घटना लिहिण्यासाठी नकार दिला. नेत्रहंजी कारणे सांगितली व डॉ. बाबासाहेब आंबेडकरांनी होकार दिला. हा इतिहास मोठा आहे. परंतु कायदेतज्ञ म्हणून डॉ. बाबासाहेब आंबेडकरांचे मोडेपण किली आहे हे नमूद करण्यासाठीच ही सांगितले आहे. पुढे घटना मसुदा समितीचे अध्यक्ष डॉ. बाबासाहेब आंबेडकर यांच्याकडे दिले व डॉ. बाबासाहेब यांनीच एकट्याने संविधान लिहिले. याविषयी धर्मेजव वीर म्हणतात की, "सभागृहाचे लक्ष नेहून कृष्णाम्मावारी म्हणाले, "सभागृहाला कदाचित माहीत असेल की, आपण निवडलेल्या सात सभासदांपैकी एकाने राजीनामा दिला. त्याची जागा भरण्यात आली नाही. एक सभासद मृत्यू पावला. त्याचीही जागा रिक्त राहिली. एक अमेरिकेस गेले. त्यांचीही जागा तशीच राहिली. चौथे सभासद संभाविकांसंबंधीच्या कामात गुंतलेले राहिले. त्यामुळे ते सभासद असूनही नसल्यासारखे होते. एक दोन सभासद दिल्लीपासून दूर होते. त्यांची प्रकृती बिघडल्यामुळे तेही उपस्थित राहू शकले नाहीत. शेवटी असे झाले, की घटना तयार करण्याचा सर्व भार एकट्या डॉ. आंबेडकरावरच पडला."

भारतीय संविधान हा एक ज्याप्रमाणे कायद्याचा ग्रंथ आहे त्याचप्रमाणे तो एक महत्त्वपूर्ण असा मानवाचर संस्कार करणारा संस्कारसंबंधीही आहे हा ग्रंथ केवळ मानवाच्या संस्कार करून याबत नाही तर केलेल्या संस्कारानुसार व्यक्तीने वागलेच पाहिजे याची व्यवस्था करणारा ग्रंथ आहे.

डॉ. बाबासाहेब आंबेडकरांनी लिहिलेल्या संविधानाला २६ नोव्हेंबर १९४९ला मान्यता मिळाली. म्हणून हा दिवस 'भारतीय संविधान दिन' म्हणून साजरा केला जातो. संविधान संपूर्ण रूपाने २६ जानेवारी १९५० रोजी लागू झाले. हा दिवस आपण 'प्रजासत्ताक दिन' म्हणून साजरा करतो. भारतीय संविधानाने हे जगातील सर्वश्रेष्ठ ग्रंथ असून सभ्य भारतीयंच्या मानवी कल्याणाचा विचार करणारा

५. संत साहित्यातील संत कवयित्री

साहायक प्रा. एल. जे. गवळी

मराठी विभाग, कर्म. आ. मा. पाटील वरिष्ठ महाविद्यालय, पिंपळनेर, ता. साक्री, जि. धुळे.

प्रस्तावना

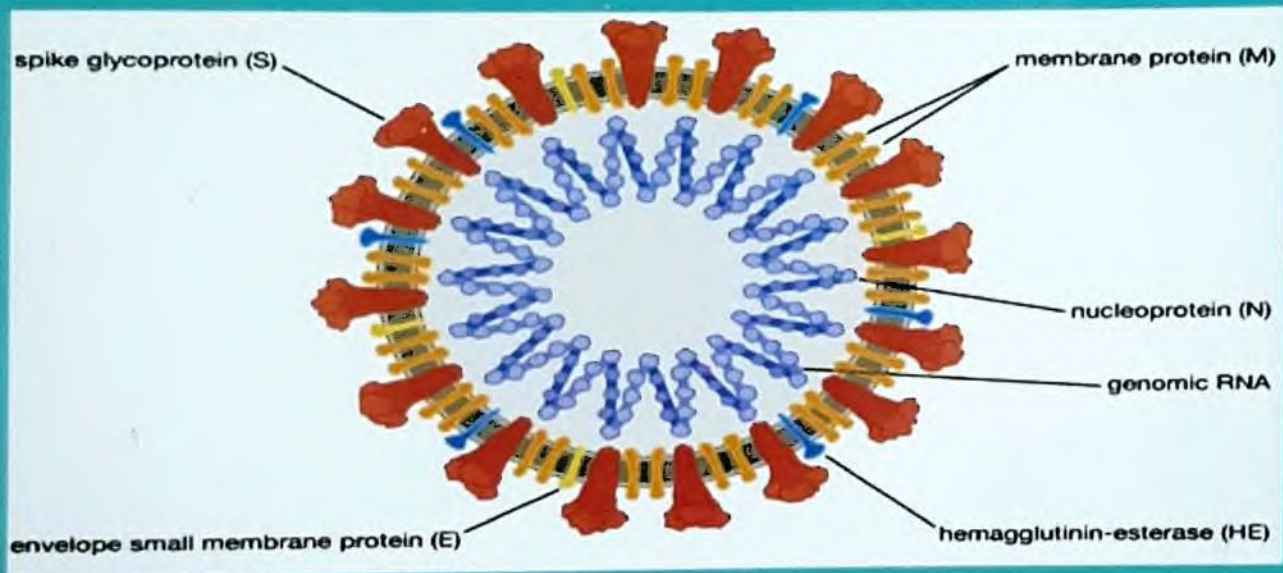
महाराष्ट्रातील भागवत धर्माच्या संत वाङ्मयाच्या जगतात भागवत धर्माचे प्रमुख प्रणेते म्हणून संत ज्ञानेश्वर, संत नामदेव, संत एकनाथ व संत तुकाराम हे गणले जातात. या पुरुष संत श्रेष्ठींमध्ये संत स्त्रीया देखील तितक्याच अग्रेसर आहेत. पुरुष संत व स्त्री संत हे पांडुरंगाच्या निस्सिम भक्तीच्या धाग्याने एकमेकांशी बांधलेले आहेत. कर्मकांड आणि अंधश्रद्धेच्या जोखडात तत्कालीन स्त्रीया जखडल्या गेल्याचे लक्षात येते. भारतीय धार्मिक जीवनात त्या कालखंडामध्ये देवदासी पध्दत, नृत्यांगणाची पध्दत, वेश्या व्यवसाय, वाघ्या-मुरळी आणि स्त्रीयांना रखेली म्हणून ठेवण्याची रुढी या सारख्या अनिष्ट प्रथा परंपरा रुढ होत्या. साहायिक अश्या प्रकारच्या अनिष्ट रुढी परंपरामुळे स्त्रीयांची सामाजिक व नैतिक पातळीवर याचा परिणाम झाला.

पिछेसे आयी, आगे धकायी' या वाक्याप्रमाणे तमाम महाराष्ट्रातील स्त्रीया याचेच अनुकरण करत होत्या. अशा काळात या संत मातांनी रुढी परंपरेचे जोखड तोडून स्वतःचीच स्वतंत्र नवी वाट शोधली मध्ययुगीन महाराष्ट्रात होऊन गेलेल्या महदंबा, संत मुक्ताबाई, संत जनाबाई, संत कान्होपात्रा, संत बहिणाबाई, संत वेणाई अशा संत कवयित्रींनी आपल्या प्रतिभाशक्तीच्या जोरावर अभंगांच्या माध्यमातून त्या काळातील समाजजीवन व स्त्री जीवन चांगल्या प्रकारे ढवळून काढले. जवळ जवळ या संत कवयित्रींना अध्यात्माची प्रेरणा संत मंडळींकडूनच मिळालेली दिसते. महदंबा या कवयित्रीला चक्रधरांची प्रेरणा. संत मुक्ताबाईंना संत निवृत्तीनाथ व संत ज्ञानेश्वर यांची प्रेरणा तर संत जनाबाईंना संत नामदेवांचा आणि बहिणाबाईंना संत तुकारामांचा सहवास लाभल्याचे लक्षात येते. या पुरुष संतांचा सहवास लाभल्यानेच स्त्री संत कवयित्रींच्या अभंग वाङ्मयाची चकाकी व लकाकी डोळ्यांना आजही दिपवणारी आहे. या लॉकडाउनच्या ७० दिवसांच्या काळात या संत मातांचे अभंग काम धंदा आटोपल्या नंतर वाचणाचे वेड असणा-या आध्यात्माचा सहवास लाभलेल्या भारतवासी माता-बहिनींच्या मनाची अभंगता टिकवण्यास समर्थ आहेत. प्राचीन मराठी वाङ्मयात विकास साधण्यात संत कवयित्रींचाही खूप मोठा वाटा आहे. त्यांचे विवेचन पुढील प्रमाणे -

संत मुक्ताबाई :- संत मुक्ताबाईंचा जन्म शके ११९९ इ.स. १२०१ मध्ये अश्विन शुध्द प्रतिपदेला झाला. संत निवृत्तीनाथ, संत ज्ञानेश्वर, संत सोपानदेव हे त्यांचे थोरले भाऊ होते. संत मुक्ताबाईंचे स्वतःचेही स्वतंत्र व्यक्तीमत्व होते. महाराष्ट्रभर त्यांचे 'ताटीचे अभंग' प्रसिध्द आहेत. त्या योगी चांगदेवांच्या गुरू होत्या. ब्रम्हगिरीची प्रदक्षिणा, माता पित्यांचा देहत्याग, ज्ञानेश्वरांनी मुक्ताबाईंस दिलेली सनद, विसोबा खेचर यांचे शरण येणे असे त्यांच्या आयुष्यातले ठळक प्रसंग सर्वत्र सात आहेत. शुध्दीपत्र मिळविण्यासाठी चौघे भावडं पैठण गावी आले. 'ताटी उघडा ज्ञानेश्वरा' अशी आर्जव मुक्ताबाईंनी इ

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HISTOLOGICAL ALTERATIONS INDUCED BY CuSO_4 AND ZnSO_4 IN EARTHWORM, *EUDRILUS EUGENIAE*

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ABSTRACT

An experiment was conducted to determine histological effects of CuSO_4 and ZnSO_4 on earthworm, *Eudrilus eugeniae*. Higher doses of CuSO_4 and ZnSO_4 caused deleterious effects on the skin of earthworm. Such histological changes could be considered as a threat of metal pollution.

Key words: Histology, *Eudrilus eugeniae*, CuSO_4 , ZnSO_4 , Sub-lethal dose, Body wall.

Introduction

Though metal ions are essential for optimum crop production, they can also act as toxicants to soil and crops at elevated concentrations. The effect of metal ions on soil organisms depends on its concentration in the soil as well as exposure time. Earthworm can accumulate metal ions from soil and when accumulated in excess those may show toxic effects. Earthworms are therefore considered as most suitable organisms for evaluation of toxicity (Bouche, 1992). Absorption of such metal ions through skin is most common in earthworms.

Morphologically earthworm skin consists of epidermis with supporting basal cells, mucus secreting goblet cells and the thin cuticle (Li *et. al.*, 2011). The cuticle is the outermost layer of skin providing protection against soil particles and bacterial infection (Fischer and Horbath, 1977). Earthworms are used as biomarker for evaluating soil contamination. However, very few studies have been reported on histological changes in the body wall of earthworm due to the exposure to metal ions. Therefore, histological change in body wall of earthworm species associated with sub-lethal concentrations of CuSO_4 and ZnSO_4 was studied.

Material and methods

Earthworm species, *Eudrilus eugeniae* was purchased from government Agriculture Nursery, Tal. Sakri, District Dhule (M.S). The experiment was performed in the plastic tray, in which 200 g dried sieved black cotton soil, treated with cow dung, was placed. It was moistened and kept aside for two days.

The LC_{50} values were calculated in previous study (Patil and More, 2020) as 118 mg/kg for CuSO_4 and 1188 mg/kg for ZnSO_4 for an exposure period of 14 days. $\frac{1}{4}$ th and $\frac{3}{4}$ th values of these were considered as lower and higher sub-lethal doses respectively. The soil was treated with these doses of CuSO_4 and ZnSO_4 as previously (Patil and More, 2020).

At the end of 14 days live earthworms from each treatment including the control (untreated) group were thoroughly washed with distilled water, cut into small pieces (15 to 20 segments) and placed it in Bouin's fixative for 24 hrs. The segments were passed through increasing concentrations (grades) of alcohol, cleared with xylene, infiltrated with liquid paraffin and finally embedded in paraffin wax (58°C M.P.). Transverse sections of the tissue measuring 7 μm thickness were obtained by using rotary microtome. The sections were stained with haematoxyline and eosin, followed by dehydration with alcohol. Those

EFFECT OF BURNING ORGANIC WASTE ON NUTRIENT CONTENT OF SOIL

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ABSTRACT

Present investigation deals with the effect of burning organic waste on soil surface. Significant increase in macro and micro nutrient content in the soil was observed, particularly under the influence of sunlight. Solarization of soil with burning of organic waste on its surface, thus, increased soil nutrient content.

Key Words: Soil, Micronutrients, Macronutrients, Solarisation, Burning, Organic waste

Introduction

Soil solarisation also called plasticulture, is an ecofriendly soil disinfection for managing soil borne plant pathogens. Soil temperature is one of the physical factors that alters rate of organic matter decomposition, mineralization of organic materials, and water retention. Seasonal variation in soil temperature is mainly due to radiant energy received from sunlight, and therefore soil solarisation play an important role in maintaining soil fertility. Attempts were made during present investigation to find out the effect of heating the soil by burning organic wastes on it, and solarisation, on soil nutrient content (Adak, *et al.*, 2012).

Material and Methods

Black cotton soil was collected from agricultural fields around Pimpalner, Tal. Sakri, Dist. Dhule (M.S.), by preparing 'V' shaped holes on the soil surface. Two cm thick slice of soil from the depth of 22 cm was collected and brought to the laboratory. The soil was divided in three parts (A, B and C), each kept in separate iron troughs having 5 kg capacity. Soil sample A was considered as control, which was placed under shade. Soil samples, B and C were kept under sunlight. The sample C was treated with the burning of organic waste on its surface at the interval of 2 month

The experiment was performed during December 2018 to May 2019. At the end of experiment, soil samples were analyzed for various physico-chemical parameters. The PH and EC were measured using digital pH and conductivity meters respectively. The inorganic nutrients were measured with the help of Atomic absorption spectrophotometer, while nitrogen (N) content was estimated by Kjeldal method (A.O.A.C., 1985). All the samples were analyzed at Shejamin Laboratory, Satana, Dist Nashik (M.S.) which is recognized by MPKV, Rahuri.

Result and Discussion

Statistically significant increase in macro- as well as micro-nutrients was recorded in the soil samples treated with burning of organic wastes and keeping it in sunlight, however the variation in bulk density, WHC, pH, N, Ca, Mg and Cu was non-significant (Table 1). pH of soil samples showed variation from 7.8 to 8.2., thus the soil samples were slightly alkaline in nature and was optimum for crops (Jackson, 1958).

Solarisation is a chemical free way of controlling pests such as pathogenic microorganisms, insects and wild plants in the soil before planting of the crops. Katan (1981) suggested that soil heating by capturing solar radiation during summer is deadly to many soil borne pathogens. Plasticulture enhanced the

TOXICITY OF CuSO_4 AND ZnSO_4 ON *EUDRILUS EUGENIAE*

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ABSTRACT

Present research work deals with toxicity of CuSO_4 and ZnSO_4 on earthworm, *Eudrilus eugeniae*, evaluated as per the OECD (1984) guidelines. CuSO_4 at the concentration of 126.07 ± 4.36 and 117.65 ± 0.95 mg/kg for 7 and 14 days of exposure respectively, whereas ZnSO_4 at the concentration of 1248.75 ± 72.48 mg/kg and 1187.75 ± 38.54 mg/kg for 7 and 14 days respectively were found to be responsible for 50 % mortality. During this study, most of the worms in artificial soil showed morphological and behavioral changes i.e. curling of body, sluggish movement, excessive mucus secretion, slight swelling of clitellar region due to the treatment with CuSO_4 , while ZnSO_4 treatment showed sluggish movement and excessive mucus secretion. The results obtained during present investigation indicated that CuSO_4 and ZnSO_4 had toxic effect on *Eudrilus eugeniae*, wherein CuSO_4 was found to be more toxic than ZnSO_4 .

Key words: Toxicity, *Eudrilus eugeniae*, CuSO_4 and ZnSO_4 , Heavy metal, Artificial soil.

Introduction

Earthworms are common soil organism found in moist environment and play an important role to improve structure and fertility of soil (Bartleff *et al.*, 2010). One of the species of earthworm, *Eudrilus eugeniae* lives on the surface layer of moist soil, and are also found wherever organic matter is accumulated (Bouche, 1977). The worm is reddish brown with convex dorsal surface and pale white, flattened ventral side. The adult worms are about 25-30 cm in length, 5-7 mm in diameter, consist of about 250-300 segments and weigh 5600 mg each (Viljoen and Reinecke, 1994).

Copper (Cu) is one of the most common metal contaminants of soil which can lead to higher earthworm mortality and reduced cocoon hatching (Lukkari *et al.*, 2005; Reinecke *et al.*, 2001; Helling *et al.*, 2000; Ma, 1988; Streit, 1984; Unwin and Lewis, 1986; Van Rhee, 1975). Similarly zinc (Zn) controls cell respiration, tissue growth, development

and regeneration in earthworms particularly under unfavorable conditions (Lukkari *et al.* 2005).

In order to study toxicity of Cu and Zn on the earthworm *Eudrilus eugeniae*, present investigation was undertaken using CuSO_4 and ZnSO_4 , respectively as contaminants of artificial soil.

Material and Methods

For the preparation of artificial soil silica sand (68%), kaolin clay (20%) and sphagnum peat (10%) were mixed. *Eudrilus eugeniae* was purchased from Vermicompost unit, Government agricultural nursery, Tal. Sakri (Dhule), brought to the laboratory and maintained as per OECD guideline (OECD, 1984). Well developed and healthy worms of approximately same size were selected for the experiment. Solutions of appropriate concentrations of CuSO_4 (Copper Sulfate) and