

SCREENING OF CERTAIN MORPHOGENETIC TRAITS IN RANDOM HUMAN POPULATION OF KALYAN DOMBIVLI MUNICIPAL CORPORATION

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Abstract: Kalyan Dombivli Municipal Corporation (KDMC) is one of the renowned city of Maharashtra where peoples migrate from different regions to get employed in the industrial area. The objective of this survey is to evaluate the phenotypic frequencies of dominant and recessive allele in random human population. A total of 500 individuals were screened for this study. In population, the phenotypic ratio of free earlobes (69.4%), rolling of tongue (56.8%), presence of widow's peak (45.20%) and individuals with dimple chin (30.80%) are surprisingly found to be highly changed. The calculated chi-square values of pair of contrasting characters like earlobes free or attached, rolling tongue and non-rollers, widow's peak and dimple chin present or absent are 8.36, 88.32, 236.80 and 520.96 respectively. Therefore, earlobes nearly follow Mendelian ratio as 3:1 while rolling tongue, widow's peak and dimple chin elicit high degree of genetic variability in random population.

Key words: random population, Phenotype, Gene frequencies.

I: Introduction:

Ethnic group elicits changes in their gene pool when considerable numbers of individuals are introduced from local or distant places either due to certain calamities or in search of an employment. Kalyan Dombivli Municipal Corporation (KDMC) is rapidly providing shelter to both skilled and unskilled human resources as it provides an employment in M.I.D.C. phase-I and Phase-II covering chemical factories, Steel and Color-Chemical Industries. As per Census 2011 in KDMC, human population 12.47 lakhs has increased to 16.21 lakhs which is beyond carrying capacity of the area. This burden of almost 4.25 lakhs population is solely due to migration from local area to attractive city areas. Migration is mainly going to act as a force on the population thereby resulting into combination of both autosomal and even sex chromosomal traits.

In this survey, attached or free earlobes, rolling or non-rolling tongue, presence or absence of widow's peak and dimple chins are observed. This attempt of survey will give clue to understand

whether somatic characters accumulate autosomal dominant genes or recessive genes in the population. It is being tested as per Hardy Weinberg's principle of genetic equilibrium. According to Chen (2010), Hardy-Weinberg principle is now a day used as very effective research tool in the analysis of gene frequency of population. Population genetics specifies the distribution of genes or alleles in a species. It also pertains to a study of the evolutionary changes within and between the ethnic population (Milgroom ,2015; Grunwald et al., 2017).

II. Material and Methods:

All together sample size of 500 individuals were screened randomly containing male and female 50% each. The study was undertaken in the Department of Zoology, DSPM's K.V. Pendharkar College of Arts, Science and Commerce (Autonomous), Dombivli, Dist.: Thane (Maharashtra), India, with Longitude 19.2407° N and Latitude 73.1287° E. The data was collected by morphological observations of various traits shown in Table 1.



Study of Sponges in Sapad Lake, Kalyan Maharashtra (India) and the Effect of Human Interference on Sponge Abundance

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Abstract: *Freshwater sponges, one of the important invertebrate fauna of aquatic ecosystem, are understudied compared to their marine forms. The infrequent records of their occurrence indicate the paucity of work on them. The study presents diversity of sponges in a lake of Kalyan, Maharashtra (India). Four species of sponges belonging to family Spongillidae were found in Sapad lake. A significant decline in sponge abundance was noted after the lake restoration. The sponge population and species number were found reduced post dredging activity. This study showed the deteriorating effect of human interference on freshwater sponges, and would thus, prove beneficial for lake management plans in future.*

Keywords: Freshwater sponge, Sapad lake, human interference, water parameters, lake restoration

I. INTRODUCTION

Lakes are standing waterbodies waterbodies and usually ephemeral, that undergo seasonal fluctuations in water levels. Of all the freshwater fauna, sponges are apparently understudied. Few handful reports are available on freshwater sponges in Maharashtra, India [1,2,3,4,5,6].

Freshwater sponges belong to phylum Porifera and are exclusively aquatic animals. They are dependent on water for their life processes such as nutrition and reproduction. They are sessile forms and feed on suspended particles brought by water currents. The sexually produced larvae are planktonic forms that swim in the aquatic medium and settle on a suitable substratum to develop into an adult sponge. In unfavourable conditions like desiccation, sponges undergo dormancy and produce asexual reproductive bodies called gemmules. To return from dormant to active phase, the gemmules require water to hatch and give rise to new sponge individuals.

Apart from the water requirement, other factors which control the sponge distribution are wave action, substrata and light availability in the waterbody [7]. Being sessile in nature, sponges are dependent on hard substrata for attachment and growth. The light availability seems important only for the algae-associated sponges.

II. MATERIAL AND METHODS

2.1 Study Area

Sapad lake is located in Kalyan taluka of Thane district, Maharashtra (India). The area of this lake is 8,677 sq.m. and its coordinates are Latitude 19°16'11" N and Longitude 73°06'33" E. This lake is located at the edge of the Sapad village, and is used for fishing and agricultural purpose in the nearby farms.

2.2 Sponge Collection and Identification

Sponges were observed at shallow areas of the lake, on different substrata like large stones, branches, concrete-built steps, etc. Live sponges were observed from October to January when lake water levels were slightly receded. The substrata were fully exposed during dry season. Small amounts of sponge samples were collected and preserved dry. For identification, sponge material was processed by boiling in concentrated Nitric acid, washing the dissociated spicules with distilled water, rinsing in ethanol followed by observation of spicules on slides under Light Microscope [8]



Evaluation of the biostimulant properties of scale gelatin from *Protonibea diacanthus* on *Vigna radiata*

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Abstract : Biostimulants are environmentally safe compounds which work by stimulating plant growth to boost agricultural yield. Animal protein hydrolysates are generally by-products obtained from food industry. Gelatin derived from fish scale waste is a protein hydrolysate which has the potential to be used as biostimulants. After pre-treating the waste scales of *Protonibea diacanthus* (Ghol) gelatin was extracted by thermal hydrolysis using an autoclave. Extracted gelatin was brownish yellow in colour with fishy odour. Scale gelatin was used as a biostimulant to study its effects on plant growth, percentage seed germination, root and shoot length, leaf area, chlorophyll content, and protein concentration of *Vigna radiata* (mung). The gelatin treatment to mung seeds showed positive influence on all the plant growth parameters. Increase in the chlorophyll content and protein content of the plant was observed which may lead to better yield. Hence scale gelatin was found to be an effective biostimulant.

Index Terms - Biostimulant, gelatin, *Protonibea diacanthus*, *Vigna radiata*, scale, chlorophyll

INTRODUCTION

In the present-day world agriculture sector is facing challenges to increase the crop production to sustain the expanding population (Rouphael and Colla, 2020). With increasing advancement in technologies several methods have been used to increase the crop production and to reduce the use of fertilizers and pesticides (Calvo, *et al.*, 2014). Seed enhancement technology is one of the eco-friendly, effective, and reliable way to improve crop production. This technique is used to improve the properties of seed like breaking of dormancy, stress tolerance, synchronization of germination etc. The treatment of seeds is performed prior to sowing (Taylor, *et al.*, 1998).

Organic material derived from animal, plant waste or microorganisms can be employed for the improvement of plant productivity and protection against unfavourable conditions. Such substances are known as biostimulants. Kauffman, *et al.*, (2007) described biostimulants as materials other than fertilizers to promote plant growth when applied in low quantities to roots. Baltazar, *et al.*, (2021) described different categories of biostimulants which are bioactive compounds like humic and fulvic acids, protein hydrolysates, seaweed extract, chitosan, beneficial fungi and beneficial bacteria. Animal derived biostimulant have a higher nitrogen content ranging from 9 to 16% of total dry matter (Polo, *et al.*, 2006). Animal based protein hydrolysates have been found to have a positive effect on yield in tomato, maize and lettuce (Parrado, *et al.*, 2008, Ertani, *et al.*, 2009, Xu and Mou, 2017).

Gelatin, which is derived from hydrolysis of collagen, is an example of an animal hydrolysate. Gelatin is obtained from alkali and acid hydrolysis of animal connective tissues, bone and skin (GMIA, 2012). It is rich in amino acids like proline and hydroxyproline. According to Kieliszewski and Shpak, (2001) hydroxyproline is found in plant cell wall. Hydroxyproline rich glycoproteins are found in abundance in plant reproductive organs like pistil, pollen tube etc and they play an important role in maintaining the structure of cell and also facilitate in communication among the cells (Wu, *et al.*, 2001). Gelatin and hydrolysed collagen are rich in hydroxyproline which may act as source for these hydroxyproline rich glycoproteins. Hydrolysed collagen and gelatin capsules have been used for the study of its biostimulant effect by Wilson, *et al.*, (2018) on cucumber plant. Use of gelatin