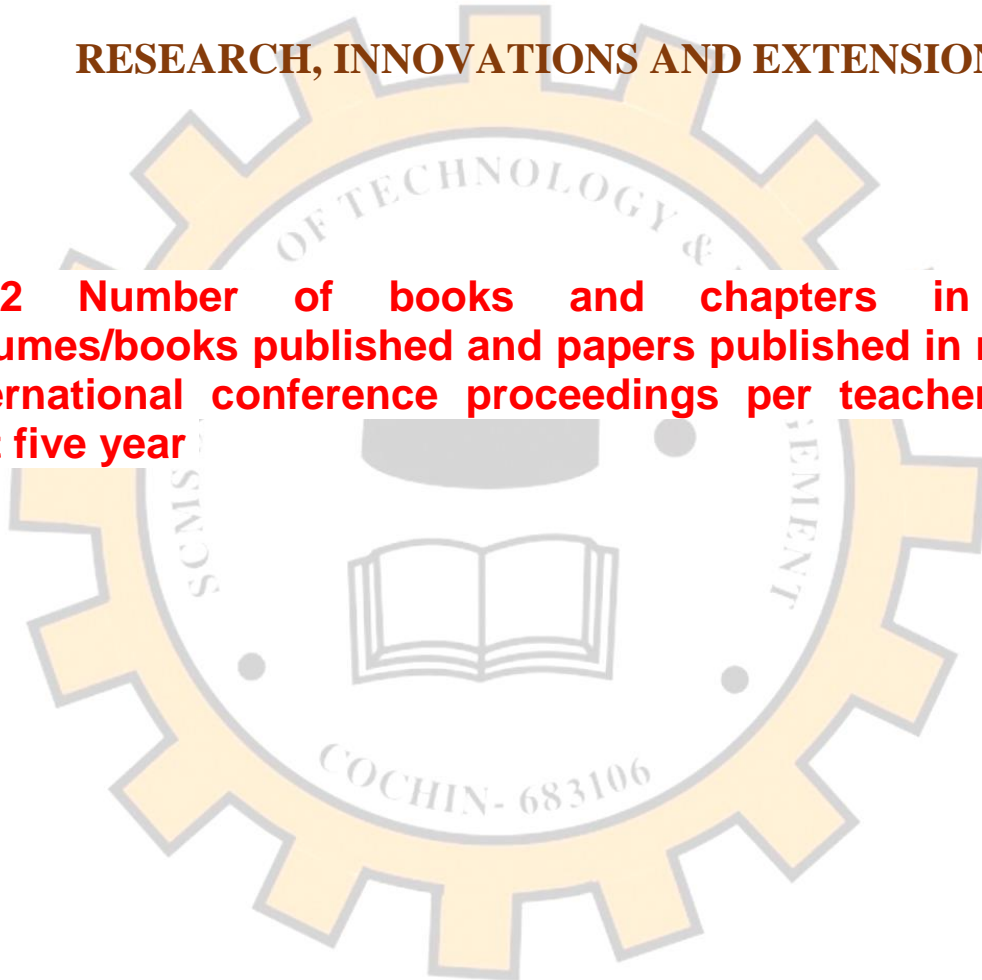




CRITERIA 3

RESEARCH, INNOVATIONS AND EXTENSION

3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/international conference proceedings per teacher during last five year



3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/international conference proceedings per teacher during last five year

2019-2020

| Sl. No. | Title of the book/chapters published | Name of the teacher |
|----------------|---|--|
| 1. | Sociogenomic variations of four populations of south India with reference to butyrylcholinesterase activity | Dr. Swapna Merlin David |
| 2. | Influence of heavy metal pollution on the antioxidant enzyme activity in Anabas testudineus collected from Periyar river at ernakulam district and the recovery responses in pollution free water | Asha Raj, M.L. Joseph |
| 3. | Fun is the Future a collection of compelling gamification success stories | Manu Melwin Joy |
| 4. | Molecular Detection of Vechur cow, the conserved breed of Bos indicus from Kerala | Mohankumar Chinnamma, Anisha Shashidharan and Salini Bhasker |
| 5. | Inducing Effect of Marker Genes PAI 1 and TGF β 1 in Wound Closure in Cell line cultures using Hemigraphis alternata leaf extract (HALE) | Divyaa Sreekumar |
| 6. | education 4.0 in India and challenges in teaching learning process | DR. Deepa Pillai, Dr. Rajeswari R |
| 7. | Cultivate the seven habits for the best performance in the learning organisations | Dr. Rajeswari R |



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Swapna Merlin David- Sociogenomic variations of four populations of south India with reference to butyrylcholinesterase activity.(ISBN 81-86366-93-98)

29th Kerala Science Congress 2017

02-13

SOCIÖGENOMIC VARIATIONS OF FOUR POPULATIONS OF SOUTH INDIA WITH REFERENCE TO BUTYRYLCHOLINESTERASE ACTIVITY

Swapna Merlin David^{1,2}, S. Lalitha^{1,3}, R. Boopathy² and C. Mohankumar²

¹Department of Biotechnology, Bharathiar University, Coimbatore, Tamil Nadu;

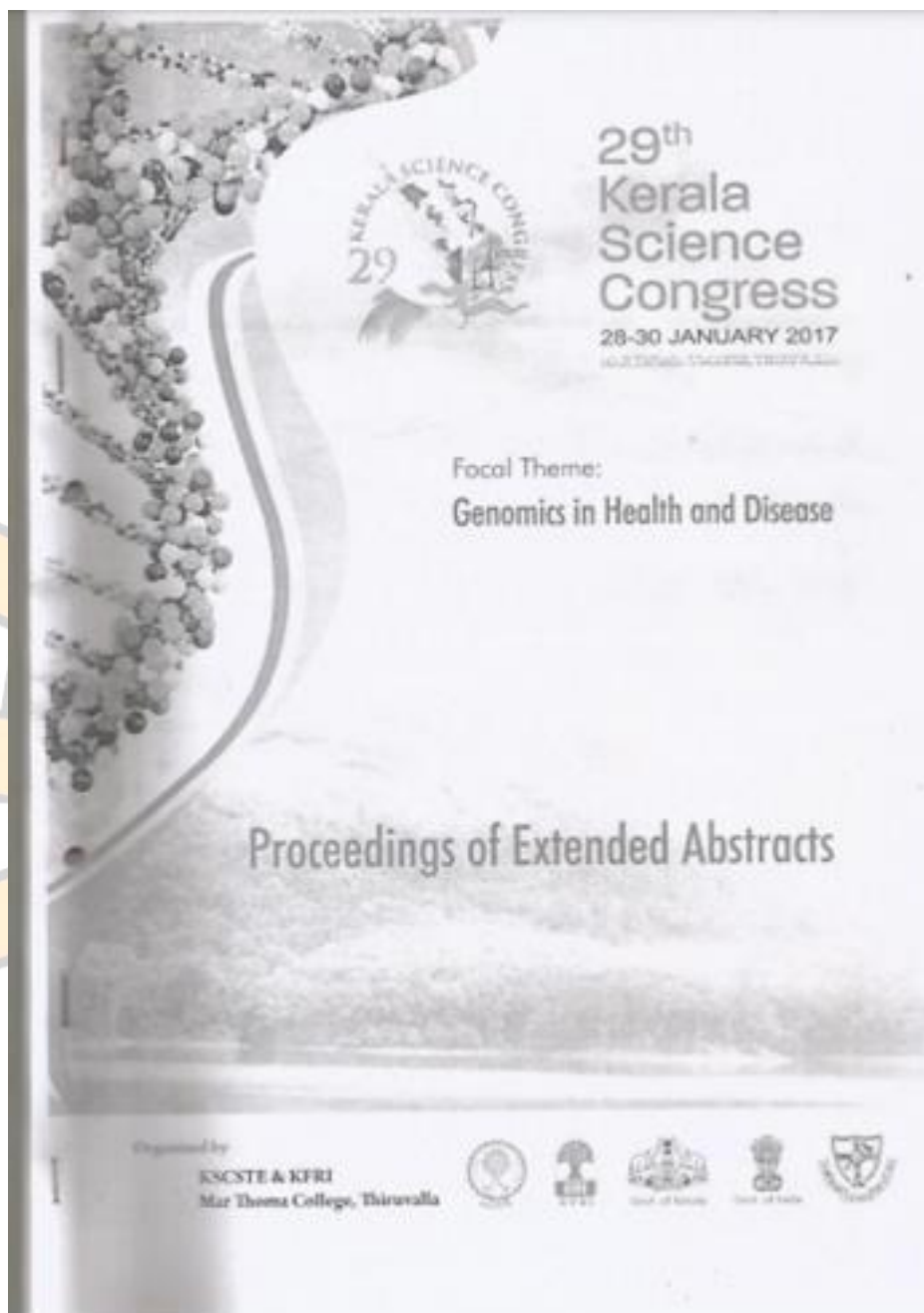
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Introduction

Butyrylcholinesterase (BChE; E.C. 3.1.1.8) enzyme was known for a century but its clinical interest becomes evident only after the World War II. The enzyme is of pharmacological and toxicological importance, as it hydrolyses ester-containing drugs and scavenges cholinesterase inhibitors. Also, it is implicated in the metabolism of local anaesthetics such as cocaine, procaine and in the hydrolysis of short-acting muscle relaxant succinylcholine and mivacurium. The enzyme is also involved in several human pathophysiological conditions such as cancers, hepatic disorders, neuronal disorders etc. and hence used as a diagnostic marker protein. Individuals experiencing prolonged apnea after a normal dose of any of the ester-containing drugs are suspected with genetic variants of BChE. In most of such cases, several BChE variants with abnormal BChE protein and lowered activity were evident in different populations. In an Indian origin ethnic community called Vysya, such a BChE variant with a point mutation (T920C) in exon2 of BCHE gene, altering the amino acid leucine to proline at 307 position (L307P) of BChE enzyme was identified with neither protein nor enzyme activity in human. Genotyping analysis showed that T920C mutant allele of BCHE gene has high frequency among the Vysya population of India. Based on this scenario, the aim of this study was to evaluate the distribution of BChE in different populations of South India. Depending on their social and professional background, we have selected three different populations named Gounder (Tamil Nadu), Mudaliar (Tamil Nadu) and Nair (Kerala) and compared with Vysya (Andhra) population.

Asha Raj, M.L. Joseph- Influence of heavy metal pollution on the antioxidant enzyme activity in *Anabas testudineus* collected from Periyar river at ernakulam district and the recovery responses in pollution free (ISBN 81-86366-93-98)



09-32

INFLUENCE OF HEAVY METAL POLLUTION ON THE ANTIOXIDANT ENZYME ACTIVITY IN ANABAS TESTUDINEUS COLLECTED FROM PERIYAR RIVER AT ERNAKULAM DISTRICT AND THE RECOVERY RESPONSES IN POLLUTION FREE WATER.

Asha Raj KR and Joseph M.L.

Department of Zoology, St. Albert's College, Ernakulam, Kochi, Kerala, India.

Extended abstract

Periyar is the carter of booming city of Kochi, one of the most urbanized and industrialised region of Kerala, it receives both urban and industrial waste in an alarming rate. Heavy metal (lead, nickel, zinc, arsenic and cadmium) pollution status in water, sediment, and the corresponding bioaccumulation in biomass of *Anabas testudineus* from two different stations of Periyar river at Ernakulam district (Station I- Eloor Industrial area, Station II- Irumbanam, Ernakulam) during three seasons (Premonsoon, Monsoon and Postmonsoon)of two year period(2012- 2014) was analysed. The antioxidant enzyme activity (Viz., Catalase (CAT), Superoxide dismutase (SOD) and Glutathione peroxidase (GPx)) in liver, gills and muscle was also estimated. The recovery responses were studied in fishes kept in aquaria maintained at controlled laboratory conditions for 30 days.

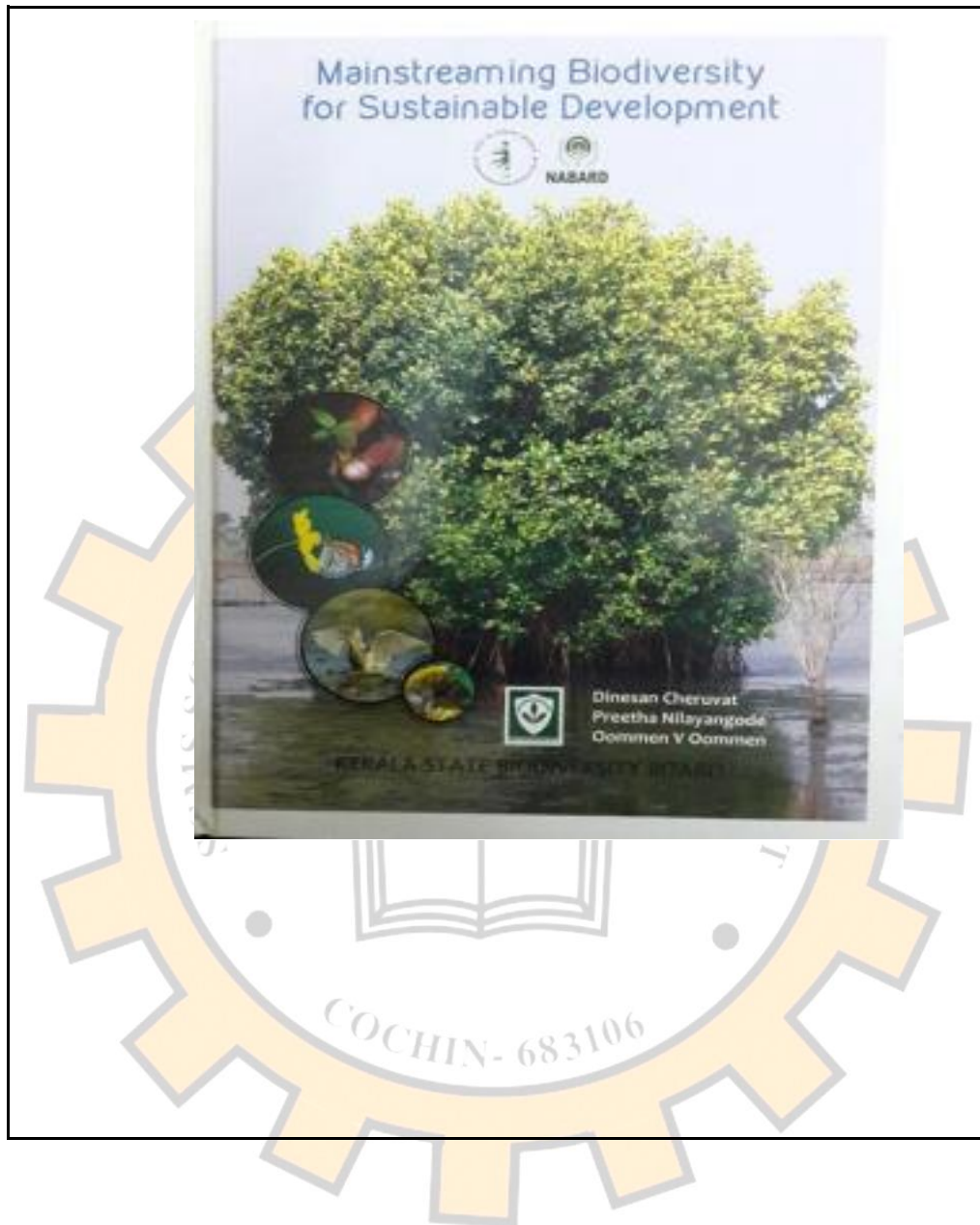
A stagnant water body free from urban and industrial influence at Cherthala, Alappuzha district was selected as reference station. The samples for the heavy metal analysis were processed according to the method suggested by APHA (1995) and analysed using the Inductively Coupled Plasma Atomic Emission Spectroscopy in Sophisticated Test and Instrumentation Centre, Cochin University of Science and Technology, Kochi, Kerala. The antioxidant enzyme activity like CAT, SOD and GPx in the organs were analysed by the method suggested by Sinha (1972); Das *et al* (2000); Rotruck (1973) respectively.

Manu Melwin Joy- Fun is the Future a collection of compelling gamification success stories (ISBN 978-1-61813-874-3)



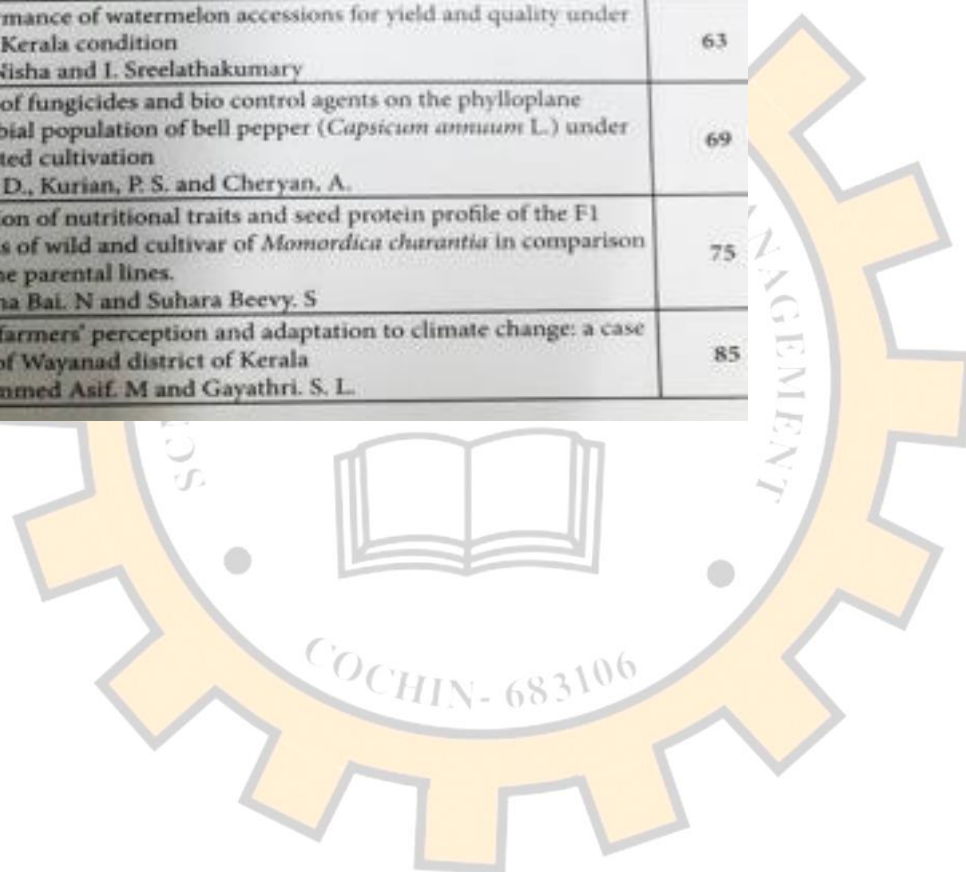
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**Mohankumar Chinnamma, Anisha Shashidharan and Salini Bhasker-
Molecular Detection of Vechur cow, the conserved breed of Bos
indicus from Kerala (ISBN No:978-81-934231-1-0)**



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MOLECULAR DETECTION OF VECHUR COW, THE CONSERVED BREED OF *BOS INDICUS* FROM KERALA

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Cattle are an important part of the socio-agricultural system in India. At present India possesses the largest cattle population in the world with 40 registered indigenous breeds. Vechur cow is the only one from Kerala (NBAGR Accession No. INDIA_CATTLE_0900_VECHUR_03030). Identification of breeds is based on conventional methods since molecular markers are not popular in India. The correct identification of the animal is of prime importance for conservation. Among the numerous proteins found in milk, Lactoferrin (Lf) is a unique whey protein owing to its multidimensional therapeutic and nutritional properties. In the case of Vechur cow, the Lactoferrin gene (BLfV) has already been amplified, cloned, sequenced and registered in NCBI. Based on the SNPs and amino acid variations in BLfV, an attempt was made towards doing a restriction enzyme analysis for determining the recognition sites in BLfV with respect to the Lf of other cross breeds (*Bos taurus* x *Bos indicus*, BLfBti). It was observed that the SNP at position 526, involving a change from T to C modifies the recognition site for PvuII present in the BLfBti sample. The Lf gene was amplified from the respective clones (BLfV-JF926526 & BLfBti-FJ589071) and purified. The gene was digested with PvuII restriction enzyme and the gel profiles compared. Comparison of the restriction profiles confirmed that the enzyme has only two cutting sites in BLfV but three in BLfBti. The consistent result from different samples highlights the specificity of the enzyme for detecting Vechur cows exclusively. Hence, this can be used as a molecular marker for identification of the breed.

Keywords: Indigenous breeds, Conservation, Vechur cows

INTRODUCTION:

Cattle, colloquially termed as cows form an important part of the socio-agriculture system in India. Cows occupy 37% of the entire livestock population of the country. At present India possesses the largest cattle population in the world and is the largest producer of milk (146.31 million metric tonnes) (USDA). The cattle wealth of India is composed of valuable indigenous breeds (both descript and non-descript), several *indicus* x *taurus* cross breeds and few *taurus* breeds well adapted to the Indian climatic conditions. Considerable variation is observed in the climatic conditions in different regions of India. This has led to the development of various breeds in domestic animals including cattle. As per the National



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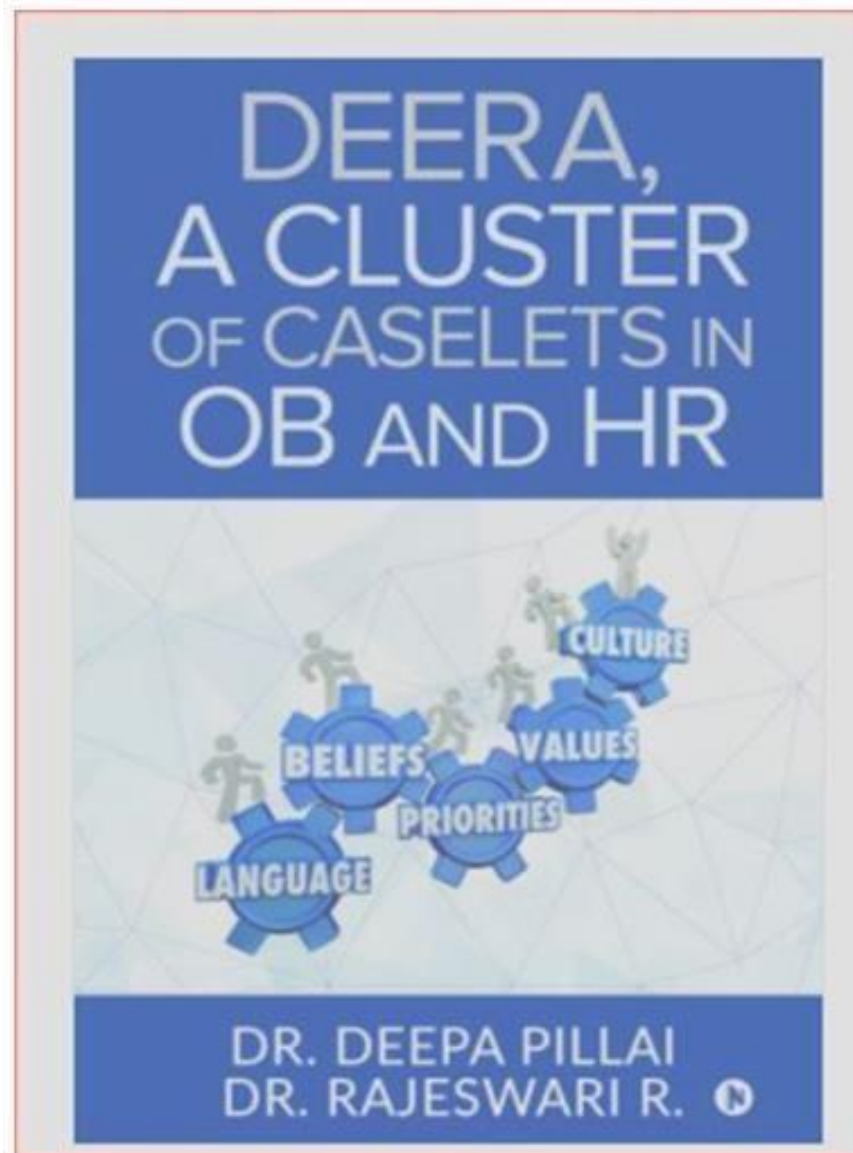
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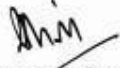
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