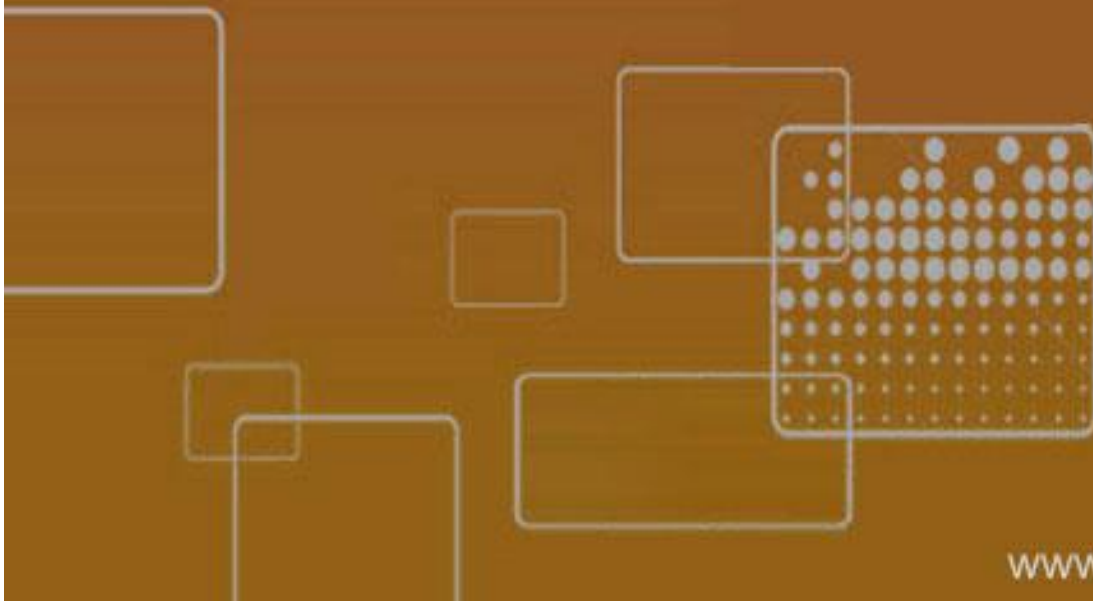


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## **THE ANALYSIS OF DETERMINANTS FACTORS IN IMPROVING THE QUALITY OF MADRASAH**

Nurhamzah

This article is aimed to analyze the influence of headmaster management, professional competence of teachers, and the teaching and learning environment on the teacher's performance in improving the quality of madrasah. The analytical method used in this article is a qualitative analysis approach with causal effectual analysis, that conducted a causal study on the relationship between the variables. Based on the results of the observation, literature review and interviews based-study, it can be concluded that the headmaster management, professional competence of teachers, and the learning environment has a positive and significant effect on the performance of teacher's instruction to improve the quality of madrasah.

**1-4**

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## **SEASONAL DISTRIBUTION OF WIND IN IRAN**

Mokhtar Karami, Mehdi Asadi

In this study, an attempt has been made to evaluate long-term average variation and fluctuation of Seasonal wind in Iran. For this purpose, wind database network was initially formed over Iran. Then, data from the base of a 30-year period, the daily period of 1/01/1982 to 31/12/2012, was supposed as the basis of the present study, and a cell with dimensions of 15 × 15 km of the studied area was spread. In order to achieve the wind seasonal changes in Iran modern methods of spatial statistics such as, Moran global spatial autocorrelation, Moran Local insulin index and Hot spots, by using of programming in GIS environment, were accomplished. The results of this study showed that the spatial distribution of wind in Iran has the cluster pattern. In the meantime, based on Moran local index and Hot spots, wind patterns in the South, South-East, East, South West and North West, have spatial autocorrelation positive pattern, and parts of the Caspian Sea coast, north and center of the country have negative spatial autocorrelation. During the study period, a large part of the country (almost half of the total area) had a significant pattern or spatial autocorrelation.

**5-11**

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## **ENHANCING THE FILTERING APPROACH FOR THE COLORED IMAGE AND WAVELET TRANSFORMATION**

Kamlesh Lakhwani, R. R. Sinha, P. D. Murarka

In this research work three spatial domain filters Average filter, Median filter and Winner filter are studied and a new filter of transform domain named as KVL filter is designed after the name initials of its founder Kamlesh Vasudev Lakhwani. KVL filter works on the basis of DWT transform compression property and pass filtering concepts. This research works gives a comparative study between all these filters.

**12-15**

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## **OPERATIONAL TRANSFORMATION IN CO-OPERATIVE EDITING**

Mandeep Kaur, Manpreet Singh, Harneet Kaur, Simran Kaur

Cooperative Editing Systems in real-time allows a virtual team to view and edit a shared document at the same time.

The document shared must be synchronized in order to ensure consistency for all the participants. This paper describes the Operational Transformation, the evolution of its techniques, its various applications, major issues, and achievements. In addition, this paper will present working of a platform where two users can edit a code (programming file) at the same time.

**16-20**

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## **BIOACCUMULATION OF HEAVY METAL ZINC (ZN) AND COPPER (CU) AND HISTOLOGY OF GROUPER (EPINEPHELUS SUILUS) IN COASTAL PANCENG WATERS OF GRESIK REGENCY**

Mustika Palupi, Sri Andayani, Muhammad Fadjar

This study aims to determine the content of heavy metals Cu and Zn and histology of Grouper (*Epinephelus suilus*). Survey research methods with technique of data collection on a 3-point sampling station. Data were analyzed descriptively. The results showed an average content of Cu and Zn at estuaries station is 0:05 mg / L. marine station and pond station that was equal to 0.02 mg / L and 0.04 mg / L. Zn content in estuaries station is 0:15 mg / L, pond of 0.1 mg / L and marine station of 0.08 mg / L. The content of Cu and Zn in the sediment that obtained at each station showed ponds station of 1.45 mg / g, marine station, and the estuaries station that is equal to 1.42 mg / g and 1.08 mg / g. Zn content in ponds station is 6.9 mg / gram. While in the estuary of 4.55 mg and 6.5 mg marine station. The content of Cu and Zn in fish in ponds station of 0.46 mg / k, marine station and the estuaries station that was equal to 0.31 mg / kg and 0.35 mg / kg. Content of Zn obtained the highest Zn concentrations of metals found in estuaries station that was 2,85 mg / kg. pond of 2.5 mg / kg and marine station in the amount of 1.52 mg / kg. Histological damage on gill tissue, liver and kidneys found any histological changed that gill hyperplasia and fusion lamela. On liver histology found degeneration, edema and some necrosis, whereas in the kidneys was found edema and necrosis.

**21-25**

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## **CULTIVATION OF EUCEUMA COTTONI IN VARIOUS PLANTING DISTANCE FROM THE RIVER ESTUARY**

Patang

This study aimed to know the effect of various distances from the estuary of the river in the cultivation of seaweed *Eucheuma cottoni* on growth and production. The research was conducted using the method of research used experimental method to completely randomized design (CRD). The treatments were tested, namely cultivation of seaweed with a distance of 450 (station I) and 900 m from estuary of the river (station II) with initial weight of each bond seaweed of 200 g / Connective with a repeat 3 times. The data collected is data growth, production and water quality. Data were analyzed with descriptive analysis. The results showed the growth and production of seaweed *Eucheuma cottoni* that tested higher obtained in the treatment of 450 m from the estuary of the river compared with the treatment of 900 m from estuary of the river that is thought to be caused due to water quality and better suited to the needs of seaweed, especially salinity and phosphate

**26-29**

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## **COST-EFFECTIVENESS OF THE INJURY TREATMENT ON DIABETES BASED ON THE LEG BETWEEN MODERN TREATMENT METHOD WITH CONVENTIONAL TREATMENT METHOD OF BONE**

Muhammad Basri

The aim of the research was to analyze cost effectiveness of the injury on diabetic leg based on the difference between modern treatment method and conventional method. The research was a quasi experimental study conducted in nurse independent practice and Tenriawaru hospital of bone. The sample was determined using purposive sampling method based on inclusive criteria. The data were obtained using instrument on the study of Bates-Jensen and record sheets of material cost of injury treatment. The difference of cost effectiveness between modern method and conventional method was examined using independent t-test with a confident level of 95%. The results of independent t-test indicate that there is a difference of cost effectiveness between modern treatment method and conventional method with a value of  $p = 0,001$ . Therefore, health service institution need to develop treatment method of injury on diabetic leg using modern treatment method.

**30-33**

### **LANGASA: SYSTEM PUBLIC CONFIDENCE AGAINST SPIRITS □ NENE MAHU □ IN NEGRI SEITH, DISTRICT MALUKU CENTRAL**

Ratna Dewi Lampong, H. Hamka Naping, Basir Syam, Muhammad Basir

The purpose of this research to describe and analyze the system of beliefs and basic philosophical contained in ritualistic langasa in Negri Morella, the application of religious rituals, analyze forms of syncretism as well as analyzing the values contained in ritual langasa on society Negri Morella, analyze the reasons . The reason langasa ritual still preserved in the country Morella and models existence of syncretism in celebration tradition for the community langasa Negri Morella and analyze models of existence of syncretism in the tradition of Morella Langasa on public land. This research forms using qualitative methods. Data collection techniques are observation and interviews directly to all related events, public events and community activities Langasa Seith in running tradition. Tools and objects were taken as the content of the offerings and the behavior of people who do Langasa tradition. The results obtained in these studies is a system of public confidence Negri Seith is a system of beliefs layered starts with the belief in supernatural forces beyond human power that the forces of nature so that in every action should more protect nature because nature has the power destroy if damaged by man , The next rising confidence in the power of the spirits of the ancestors (□tete nene moyang□), it is believed that the □tete nene moyang□are saints who never lost even have died. □Tete nene moyang□ are believed to remain living in the vicinity of human life while overseeing all human actions so that at any given moment they can give goodness in every human demand against him but also can provide disaster if people violate customary rules. Because according to the society that □tete nene moyang□ customs form which is run by the public until now. □Nene Mahu□ believed its existence because it has a lot of events and incident, experienced by the people associated with the power □Nene Mahu□ are able to meet all the requests addressed to him. It also □Nene Mahu□ believed to give good or for bad for humans if humans do good as well as errors. This makes the public still believes the □Nene Mahu□ and to keep the tradition langasa if there is a particular intention or just to show respect to him.

**34-36**

### **A STUDY OF ENVIRONMENTAL IMPACTS ON THE CORAL RESOURCES IN THE VICINITY OF THE SAINT MARTIN ISLAND, BANGLADESH**

Shaikh Sayed Ahammed, M. Ali Hossain, Md. Zainal Abedin, Md. Abdul Khaleque

A study of the environmental impacts on the coral resources in the vicinity of the Saint Martin Island, Bangladesh was conducted with a view to making an assessment of the current status of coral resources in the island and identifying major natural and anthropogenic environmental threats to the future sustainability of these resources. It is evident that the coral resources have been reduced significantly, and currently, only 41 coral species are available. The existing environmental condition (assessed by pH, salinity, turbidity and temperature) in the island is not found responsible for the survival of the corals. The study also reveals that the major anthropogenic interventions are

responsible for the gradual depletion of the coral resources. The major anthropogenic threats to the coral resources are coral collection and overfishing. In addition, coral extraction is identified as a potential threat to the future integrity of coral communities in the island. Environmental threats from anthropogenic activities related to sedimentation, land erosion and pollution are also the concerns for the coral communities in the island. For the conservation of the coral population, no coral monitoring cell has been established in this island.

**37-39**

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## **EFFECT OF PH ON THE PHYSICOCHEMICAL PROPERTIES OF MoVTENBOx CATALYSTS FOR OXIDATION OF PROPANE TO ACRYLIC ACID**

Syazwani M.N, Irmawati R, Taufiq-Yap Y.H, Zainuddin, N.

Abstract: Mo<sub>1.0</sub>V<sub>0.3</sub>Te<sub>0.23</sub>Nb<sub>0.12</sub> mixed metal oxide catalysts were prepared via slurry method followed by microwave irradiation. The pH (1, 3, 5, and 7) of the synthesis solution was shown to affect physicochemical properties of the catalysts. XRD analysis revealed that the monophasic orthorhombic M1 phase Te<sub>2</sub>M<sub>2</sub>O<sub>5</sub>7 (M = Mo, V, and Nb) was only developed when pH was 1. This catalyst displayed BET surface area, 18.0 m<sup>2</sup>/g the highest among other samples after post treatment and suggested the elimination of hexagonal M2 phase. The sample was also highly reducible with reduction temperature coincide very well with the temperature of catalytic reaction. Therefore, this catalyst was also active and selective for anaerobic propane oxidation to acrylic acid.

**40-45**

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## **THE ESSENCE OF SOCIAL AND ENVIRONMENTAL RESPONSIBILITIES OF COMPANIES IN INDONESIA (A STUDY OF ECONOMIC-LAW)**

Nur Arifudin, Anwar Borahima, Juajir Sumardi, Irwansyah

The object of research in this paper is the essence of Social and Environmental Responsibilities can be carried out effectively and efficiently. In addition, to explore the essence of Social and Environmental Responsibilities, this paper also attempted to analyze the extent to which the substantive law of Social and Environmental Responsibilities may encourage equalization of welfare state. This research is a normative research. Legal materials used in the study is literature materials, the literature relating to the Social and Environmental Responsibilities, Legal System, Economic Democracy, Economic Welfare, Economic Sustainability, Economic Analysis of Law. The results of the research shows that Social and Environmental Responsibilities is a balance point which at that point if it can be managed properly it will deliver in a state close to the relationship balance between the community, the company and the government so that the welfare of nation can begin to be realized. Social and Environmental Responsibilities is a form of follow-up of the real form of Article 33 paragraph 3 of Constitution 1945. For that, it needs to be strengthened its existence in order to understand completely and thoroughly for the welfare of Indonesian people through the good governance of Social and Environmental Responsibilities, so as to realize a good business climate in Indonesia through the creation of a harmonious relationship between the community, the company and the government.

**46-50**

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## **THE IMPOSITION ENVIRONMENTAL COST-LOADING OF COMPANIES INVESTING IN COAL MINING**

Tomi Risman, Marthen Arie, Abrar Saleng, M. Yunus Wahid

The instrument of environment is an effort to prevent environmental problems caused by mining activities both in

forms and its nature. The aims of the study are to analyze and understanding the essence of environment cost-loading in order to restore the environment from coal mining activities, both when mining taken place and post-mining. The type of research used is a normative-legal research. This research was conducted in the province of South Kalimantan, with the consideration that the South Kalimantan is one of the largest coal-producing Provinces in Indonesia. In addition, the environment cost-loading for investor in coal mining have the same properties in all coal mining sites in Indonesia. The results of the research indicated that the imposition and environment-cost in investment activity in the field of coal mining can be seen from the two approaches, i.e the economic and legal approach. Economic approach is an approach that emphasizes the economic benefits gained by the owner of activities when they comply with the environmental requirements stipulated by laws and environmental regulations. Realizing the importance of environmental cost-loading for the company that manages the coal mining, especially for the utilization of prevention of pollution caused by coal mining activity, it is necessary to develop an institutional guarantee of recovery from the effects of pollution by establishing fund insurance for environmental restoration as a result of pollution. Thus, in order to optimize the implementation of guarantee fund for environmental restoration are specifically utilized for post-mining reclamation, then granting the status of Clean and Clear (C & C) for coal mining investor must be presupposing the proof of guarantee fund has been placed for environmental restoration post-mining.

**51-55**


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### **COMPARISON OF ANTIBACTERIAL EFFECTS BETWEEN ALOE VERA AND SODIUM FLUORIDE ON THE AMOUNT OF STREPTOCOCCUS MUTANS COLONY (ATCC) IN VITRO**

Yetty Herdiyati Nonong, Arya Arta Agusta, Mieke Hemiawati Satari, Willyanti Soewondo

Streptococcus mutans is a bacterium that plays an important role in the process of caries. These bacteria can produce glucosyltransferase (GTF) enzymes which can change the disaccharide, particularly sucrose into glucan that serves as a medium for the initial attachment of bacteria to the tooth surface and produce acids in the metabolic process which is the beginning of dental caries. Aloe vera is natural materials that has a lot of active substances that contains antibacterial effects. Sodium fluoride is a material commonly used in the prevention of caries, serves to remineralization of the teeth and has anti-bacterial properties. The purpose of this study was to analyze differences in decline in the number of colonies of Streptococcus mutans after in vitro administration of Aloe vera and Sodium Fluoride. This research was conducted using pure experimental research on the media containing artificial saliva, enriched with sucrose and the culture of Streptococcus mutans (ATCC 25 175) was incorporated in it. Samples are given treatments of Sodium Fluoride and Aloe vera extracts to see the difference in the number of bacterial colonies. Statistical analysis uses the t test to see a decrease in the number of colonies of Streptococcus mutans between treatment Aloe vera and Sodium Fluoride. T-test equality of two mean the two populations doesn't show a significant difference between the decline in the group of Aloe vera and Sodium Fluoride group, with p-value of 0.2144. This study concludes that there is no difference in the decreasing in the number of colonies of Streptococcus mutans significantly after in vitro administration of Aloe vera and Sodium Fluoride.

**56-61**


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### **PHYSICO-CHEMICAL AND MICROBIOLOGICAL QUALITY OF SOME CONSUMER PREFERRED PLAIN SET YOGHURTS SOLD IN MATARA MUNICIPAL AREA OF SRI LANKA**

K.K.G.U Hemamali, V.S Jayamanne, S.M. Amarathunge

As yoghurt is a health food, assessment of quality of commercialized yoghurt during storage period in refrigerator is needed. Lack of data on quality parameters of yoghurt brands in Sri Lanka is impediment to consumer health. This study is an attempt to fill that gap by providing data on evaluation of the changes of physico-chemical and microbiological parameters of some plain set yoghurt sold in Matara municipal area of Sri Lanka. Five different brands of plain set yoghurt samples were collected on the basis of consumer preference for the present study. From each brand, fifteen samples were analyzed by means of their physico-chemical (syneresis effect, pH, titratable acidity, total protein content) and microbiological composition (total plate count, total yeast and mould count) by using three

replicates of each sample at 4, 7, 14, 21 and 28 days intervals from production date under refrigerated condition (4 °C) and compared against local and international standards. All microbiological parameters and total protein content of all plain set yoghurt brands were not within the permissible range for local and international standards. Titratable acidity was only in the permissible range of local standards. All the physico-chemical parameters and microbiological parameters of collected samples were significantly affected by storage period. Good quality yoghurt of physico-chemical and microbiological parameters with hygiene conditions during processing and storage should be encouraged for consumption.

**62-65**

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## **COLLOIDAL SYNTHESIS AND CHARACTERIZATION OF CDSE QUANTUM DOTS: ROLE OF CD:SE MOLAR RATIO AND TEMPERATURE**

M. R. Karim, Hilmi Unlu

Semiconductor Cadmium selenide (CdSe) Quantum Dots (QDs) were synthesized via colloidal chemistry method at moderately lower growth temperatures. Optical absorption and photoluminescence (PL) spectroscopy techniques were used to characterize the optical properties of CdSe QDs. Optical properties of colloidal CdSe QDs were successfully controlled by changing the initial Cd:Se molar ratios and temperature. Optical absorption and PL spectrum both showed gradual red shift with increasing Cd:Se molar ratio and temperature. High-resolution transmission electron microscopy (HRTEM) technique were used to study the structural properties of CdSe QDs. Full width at half maximum (FWHM) values obtained from the emission spectrums were helped to prove the narrow size distribution, which coincides with the matching results of HRTEM images and theoretical calculations.

**66-70**

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## **COUNT DATA ON CANCER DEATH IN OHIO: A BAYESIAN ANALYSIS**

Walaa Hamdi

This paper considers statistical modeling of count data on cancer death in Ohio State. We obtained count data on male and female from a website of the Centers for Disease Control and Prevention and used Bayesian analyses to find suitable models which help us to do inferences and predictions for next year. To assist us in selecting appropriate models, we use criteria such as the DIC. In this paper, we analyze the data to spatial/ longitudinal so we can capture possible correlations. Using our analyses, we make predictions of the numbers of people who will die with cancer in a future year in Ohio State.

**71-73**

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## **MICROBIAL PROFILING OF CYANOBACTERIA FROM VIT LAKE**

Swati Singh, Swati Patidar, Shweta Goyal, Arabi Mohammed Saleh

The application of molecular biological methods to study the diversity and ecology of micro-organisms in natural environments has been practice in mid-1980. The aim of our research is to access the diversity composition and functioning of complex microbial community found in VIT Lake. Molecular ecology is a new field in which microbes can be recognized and their function can be understood at the DNA or RNA level, which is useful for constructing genetically modified microbes by recombinant DNA technology for reputed use in the environment. In this research first we will isolate cyanobacteria in lab using conventional methods like broth culture and spread plate method, then we will analyze their morphology using various staining methods and DNA and protein composition using electrophoresis method. The applications of community profiling approaches will advance our understanding of the

functional role of microbial diversity in VIT Lake, controls on microbial community composition.

**74-77**

## **LEGAL PROTECTION AGAINST THE DANCE CREATOR IN INDONESIA**

Juwita, Juajir Sumardi, Oky Deviany Burhamzah, Hasbir Paserangi

This research aimed to find out and to analyze the ideal legal protection so it can encourage the creator of dance in developing a creation in the field of dance and to find out and to analyze and to get the concept of legal protection of copyright in the field of dance after the enactment of Act No. 28 of 2014 concerns Copyright. This research is empirical juridical. The technique of collecting legal material is conducted through interviews, questionnaires to respondents and literature study, i.e by collecting various documents in the form of primary, secondary and tertiary legal materials. The results of research showed that: (1). Dance is a part of copyright associated with diverse art and culture owned by the Indonesian, certainly dance produced by consume energy, thoughts, time, and cost by Dance Creator, with regard to the creation, the state has given protection of dance creator for art as stipulated in Article 40 letter e of Act No. 28 of 2014 as an expression of respect and appreciation to the Dance Creator; (2) In association with the regulation on the protection of creative works of art dance regulated in Act No. 28 of 2014, the creator of dance argues is very important to give the protection of dance creator for their copyrighted works, particularly their rights as a creator of dance i.e moral and economic rights. Giving moral and economic rights cannot be felt fully by the creator of dance, this is due to the creator of dance does not have an institutions that will accommodate the creativity of creators that useful for their welfare.

**78-82**

## **EVALUATION OF LOCAL SCOUR DEVELOPMENT AROUND CURVED NON-SUBMERGED IMPERMEABLE GROYNES**

Dr. Hasan Mahdi M. Al-Khateeb, Dr. Hayder Abdulameer K. AL-Thamiry, Huda Hadi Hassan

Groynes are man-made hydraulic structures constructed for a variety of purposes. They extend outside the bank in the depth of streams. Local scour usually occurs around groynes resulting in problems of interest to hydraulic engineers. In this study, laboratory experiments were conducted to evaluate the local scour around different number of groynes distributed on different spacing with different shapes. Physical models have been developed for groynes installed in a straight hydraulic channel grounded with uniform cohesionless (soil) as bed material with medium grain size ( $d_{50} = 0.69$  mm). The experiments were conducted under subcritical flow and Clear- water conditions. Three different numbers of groynes (single, double and triple) were used to indicate the impact of the numbers on the local scour; such impact have been observed to be as reverse relationship, specially, for the intermediate groynes. Different spacing between groynes as (1, 1.5, and 2) times the length of groynes were used in this study. For the range tested, it has been observed that for each spacing decrease by (0.5  $L_g$ ) there was a decrease in scour depth about (20%). Also, several lengths of groynes (13, 10, and 7) cm were used, and it has been observed that scour depth is decreased about (20 - 53)% by decreasing the ratio of groyne length to main flow width ( $L_g/B$ ) by (7.5%). Two different shapes of curved groynes, namely as, quadrant (quarter of a cylinder) and semi-parabolic shaped groynes were used to indicate the effect of groyne shape on the local scour. Generally, scour is decreased about (75) % in quadrant shape groynes as compared with that of semi-parabolic shape groynes.

**83-89**

## **STRESSORS AMONG CSPC SCHOLARS**



Dr. Jose Ariel R. Ibarrientos

Scholarships are offered by the college in order to help students to address their financial difficulties. They are subject to a rigid screening and the pressured imposed upon them may bring out a stressful experience that can affect their daily activities. The perceived social, psychological, academic, economic and bureaucratic stressors were identified using the descriptive inferential method among the 203 scholars for school year 2013- 2014. Findings revealed that scholars are highly stressed with people's high expectations on them as scholars and with various assignment imposed to them as scholars. Moreover, scholars are stressed of fear of losing their scholarship. T-test shows that there is no significant difference on the stressors experienced by both the academic and non-academic scholars and so as to their coping mechanism. The proposed Stress Coping Mechanism Guide will help them to manage their stressors.

**90-98**

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## **EFFICIENT LOAD SCHEDULING METHOD FOR POWER MANAGEMENT**

Vijo M Joy, S Krishnakumar

An efficient load scheduling method to meet varying power supply needs is presented in this paper. At peak load times, the power generation system fails due to its instability. Traditionally we use load shedding process. In load shedding process disconnect the unnecessary and extra loads. The proposed method overcomes this problem by scheduling the load based on the requirement. Artificial neural networks are used for this optimal load scheduling process. For generate economic scheduling artificial neural network has been used because generation of power from each source is economically different. In this the total load required is the inputs of this network and the power generation from each source and power losses at the time of transmission are the output of the neural network. Training and programming of the artificial neural networks are done using MATLAB.

**99-101**

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## **AN EFFICIENT INTERCEPTION MECHANISM AGAINST CHEATING IN VISUAL CRYPTOGRAPHY WITH NON PIXEL EXPANSION OF IMAGES**

Linju P.S, Sophiya Mathews

Visual cryptography is a technique of cryptography in which secret images are divided into multiple shares and are distributed to different entities. Each secret can be reconstructed by superimposing these shares using different operations. Common traditional drawbacks of all existing methods are pixel expansion and noise at output. Another major issues that can occur in existing visual cryptography systems are Cheating between share holders and Share holders cheating owner. In order to overcome these limitations, sealing algorithm is used with two applications of VC such as MIVC and EVC. Here two secret images can be send at the same time by converting them to halftone representations which in turn are partitioned as three shares in total.

**102-106**

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## **IMPLICATIONS OF ESTABLISHING LOCATION, PHYSICAL EVIDENCE, AND CUSTOMER SATISFACTION LEVEL OF CUSTOMER LOYALTY IN RITEL MODERN IN MAKASSAR**

Miah Said, Djabir Hamzah, Mahlia Muis, Jusni

Currently retailing business in Makassar, from time to time increasingly in demand by the whole society. They tend to combine marketing activities and households in the shop, with a variety of other recreational activities or simply stroll.

This phenomenon is at least encouraging marketers to reach and use the market opportunity to market the product in the achievement of the goals and objectives of the company. This study will examine about "Implications Siting, Physical Evidence, and Consumer Satisfaction Level Of Customer Loyalty In Modern Retail Company In Makassar". Where the author chose a modern retail company (minimarkets, supermarket, hypermarket) who offer products such as food and beverage for the daily needs in the area of Makassar as the object which is currently growing so rapidly. The research approach used was survey research methods, which is a method of collecting primary data obtained directly from the original source through oral and written questions. While this type of research is Explanatory Research, which explains the causal relationship between the study variables with hypothesis testing. Collecting technique uses scale Likert variables; 1 to 5. The technique of collecting data through interviews with managers and employees in each of the modern retail companies, to obtain information or documentation in the form of consumer data that is still active in the purchase of existing products, through questionnaires containing a list of questions which was distributed to respondents to obtain the data directly (Maholtra, 2006)[1]. The population in this study is a modern retail enterprise customers who have 3 cards of customers (minimarket, supermarkets, hypermarkets), in the city of Makassar. Further sampling is done by using random sampling techniques. As for determining the number of samples is done by using Slovin opinion of the Umar Husein (2001: 78)[2]. In this study, the type of data is qualitative and quantitative data obtained in the form of interviews and figures (numeric) of the questionnaire. Variables used in this study is the independent variable (independent variable), mediating variables (intervening variable) and the dependent variable (dependent variable). In this study, independent variables are location and Physical Evidence, mediating variables are Commitment, Switching Cost, Customer Satisfaction and the dependent variable is customer loyalty. The research model that will be used in this research is a tiered structure model and to test the hypothesis used analysis technique SEM (Structural Equation Modeling), which is operated through a program Lisrel 8.80 with SPSS version 15.0.

**107-114**

## **SMARTPHONE BASED APPROACH FOR MONITORING INEFFICIENT AND UNSAFE DRIVING BEHAVIOR AND RECOGNIZING DRINK AND DRIVE CONDITIONS.**

G. V. Mane, Saurabh Dhabe, Utkarsh Nadgouda, Akshay Sonawane, Vipul Jadhav

Many automobile drivers having knowledge of the driving behaviours and habits that can lead to inefficient and unsafe driving. However, it is often the case that these same drivers unknowingly manifest these inefficient and unsafe driving behaviours in their everyday driving activity. The proposed system proposes a practical and economical way to capture, measure, and alert drives of inefficient and unsafe driving as well as highly efficient system aimed at early detection and alert of dangerous vehicle maneuvers typically related to drunk driving. The upcoming solution consists of a mobile application, running on a modern smartphone device, paired with a compatible OBDII (On-board diagnostics II) reader.

**115-116**

## **EFFECT OF VIBRATION ON OCCUPANT DRIVING PERFORMANCES: MEASURED BY SIMULATED DRIVING**

Amzar Azizan, Ratchaphon Ittianuwat

Although the performance of vehicle driver has been well investigated in many types of environments, however, drowsy driving caused by vibration has received far less attention. Experiment procedures comprised of two 10-minutes simulated driving sessions in no-vibration condition and with-vibration condition. In with-vibration condition, volunteers were exposed to a Gaussian random vibration, with 1-15 Hz frequency bandwidth at 0.2 ms<sup>-2</sup> r.m.s. for 30-minutes. A deviation in lane position and vehicle speed were recorded and analyzed. Volunteers have also rated their subjective drowsiness by giving score using Karolinska Sleepiness Scale (KSS) every 5-minutes interval. Strong evidence of driving impairment following 30-minutes exposure to vibration were found significant in all volunteers ( $p < 0.05$ ).

**117-122**

## **EFFECTIVENESS OF TEACHING & LEARNING MATHEMATICS USING CHILDREN'S HOME LANGUAGE AND CULTURAL TOOLS**

Mohammed Hafiz, Mohammed Farik

The purpose of this research paper is two-fold. First, the aim is to prove the effectiveness of using children's home language and cultural tools in teaching and learning mathematics at primary school level in Fiji. For privacy reasons, the actual name of the participating school is not mentioned in this paper. Secondly, this paper also demonstrates how practicing teachers can use the problem-solving approach and selective analytics to do research in order to improve their own teaching and learning in the classroom. We believe that the new findings and methods demonstrated in this paper will help improve mathematics teaching & learning processes and motivate teachers to collaborate with fellow teachers and do more researches in their classrooms and to publish their works.

**123-127**

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## **A COMPREHENSIVE REVIEW IN CORPORATE SOCIAL RESPONSIBILITY: A CASE STUDY OF HONDA**

Ang Kean Hua

Honda becomes everyone dreams to move forwards. Honda company are designing machine which transform into production of automobiles and motorcycles, and successfully patented into humanoid robot and supporting human body system. The sacrifice of experts and personages towards Honda brings infinite value to the progressive of human society. As a result, technology becomes ultimate guide to reduce suffering and improve human life quality. The development of CSR is to contribute to people and society by continuously design unique products and services from global perspective. Sustainable CSR are expanded through customer services operations and customer satisfaction initiatives with the 3P's.

**128-136**

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## **EFFECT OF VIBRATION AMPLITUDE LEVEL ON SEATED OCCUPANT REACTION TIME**

Amzar Azizan, Ratchaphon Ittianuwat, Zhengqing Liu

The past decade has seen the rapid development of vibration comfort in the automotive industry. However, little attention has been paid to vibration drowsiness. Eighteen male volunteers were recruited for this experiment. Before commencing the experiment, total transmitted acceleration measured at interfaces between the seat cushion and seatback to human body was adjusted to become 0.2 ms<sup>-2</sup> r.m.s and 0.4 ms<sup>-2</sup> r.m.s for each volunteer. Seated volunteers were exposed to Gaussian random vibration with frequency band 1-15 Hz at two level of amplitude (low vibration amplitude and medium vibration amplitude) for 20-minutes in separate days. For the purpose of drowsiness measurement, volunteers were asked to complete 10-minutes PVT test before and after vibration exposure and rate their subjective drowsiness by giving score using Karolinska Sleepiness Scale (KSS) before vibration, every 5-minutes interval and following 20-minutes of vibration exposure. Strong evidence of drowsiness was found as there was a significant increase in reaction time and number of lapse following exposure to vibration in both conditions. However, the effect is more apparent in medium vibration amplitude. A steady increase of drowsiness level can also be observed in KSS in all volunteers. However, no significant differences were found in KSS between low vibration amplitude and medium vibration amplitude. The results of this investigation suggest that exposure to vibration has an adverse effect on human alertness level and more pronounced at higher vibration amplitude. Taken together, these findings suggest a role of vibration in promoting drowsiness, especially at higher vibration amplitude.

## **COAGULATION AND HEMAGGLUTINATION PROPERTIES OF THE CRUDE EXTRACT DERIVED FROM THE LEAVES OF EUPHORBIA HIRTA L., TRIDAX PROCUMBENS L., AND VERNONIA CINEREA (L) LESS**

Romeo C. Ongpoy, Jr.

This study aims to investigate the potential of selected wild grasses from the Philippines as coagulant and typing sera. To do this, *Euphorbia hirta* L., *Tridax procumbens* L., and *Vernonia cinerea* (L) Less aqueous infusions were each subjected to blood components from healthy individuals. The plasma part of the blood was used to test for coagulation where Plasma Clotting Time (PCT) and Factor VIII screening test were the procedures used to test the different leaf extracts. On the other hand, the Packed Red Blood Cell part of the blood was used to test for hemagglutination where microscopic and macroscopic evaluations were the procedures used to test the different leaf extracts against the blood groups from the ABO system. About this study, it was found out that all the wild grasses did not give a comparable coagulation to the commercially available positive control which is Calcium Chloride while *Euphorbia hirta* L. gave a positive hemagglutination to Type A and Type B cells, *Tridax procumbens* L. gave a positive hemagglutination to Type A cell and *Vernonia cinerea* (L) Less gave a positive hemagglutination to Type B cells both in macroscopic and microscopic evaluations. The results show that all the wild grasses tested may not be used as a coagulant but all of them may have a potential as a typing sera.

142-146

## **IN VITRO EVALUATION OF SELECTED PLANT EXTRACTS AS BIOCONTROL AGENTS AGAINST BLACK MOLD (ASPERGILLUS NIGER VAN TIEGHEM) OF ONION BULBS (ALLIUM CEPA L.)**

Saifeldin A. F. El-Nagerabi, Awad H. M. Ahmed, Abdulkadir E. Elshafie

Black mold disease caused by *Aspergillus niger* V. Tiegh. is the most devastating infection occurs in onions (*Allium cepa* L.) under field and store conditions. The use of biocontrol agents is ecofriendly approach for controlling seedborne and soilborne diseases compared to the use of toxic synthetic fungicides. This study has been designed to assess the contamination levels of onion seeds with *A. niger* and its effect on seed germination, and to evaluate the in vitro antifungal activity of *Prunus mahaleb* seeds, *Commiphora myrrha* resin (0.5, 1.0, 1.5, 2.0 g/100 ml), *Syzygium aromaticum* dry buds (clove), and *Panax ginseng* roots extracts (0.5, 1.0, 2.0, 2.5 g/100 ml) against black mold of onion bulbs. The fungus is seedborne pathogen which significantly contaminated onion seeds (89-100%) and reduced seed germination (39-83%). The extracts of clove caused 43-96% inhibition in spore germination followed by mahaleb (37-96%), myrrha (33-88%), and ginseng (34-87%). The highest concentration of these extracts (3.0%) did not affect seed germination, but significantly reduced seed contamination by *A. niger* up to 84%, 80%, 71%, and 65% for *Syzygium aromaticum*, *Syzygium aromaticum*, *Panax ginseng* and *Prunus mahaleb*, respectively. The extracts apparently inhibited the fungal growth and mold development on stored onion bulbs which indicates the antifungal property of these extracts against *A. niger*. Therefore, they can be recommended as effective biocontrol agents to reduce seed contamination and enhance the storability of onion bulbs. Thus, the use of healthy and certified seeds for onion production is a priority.

147-152

## **INVESTIGATING AND EVALUATING OF NETWORK FAILURES AND PERFORMANCE OVER DISTRIBUTED WAN IN APPLICATION PROTOCOL LAYER**

Enoch Okoh Kofi, Micheal Asante, Francis Kwadzo Agbenyegah

The Experiment was done to find out network failures and application performance relationship over distributed Wide Area Net (WAN). In order to access related application over the cloud there must be an internet connectivity which will help the respective workstations to access the remote server for applications being deployed over the network. Bandwidth improvement helps in reducing utilization over the network and it also helps in improving Application Efficiency of these Applications in terms of Response Time. Routers were configured under Enhance Interior Gateway Routing Protocol (EIGRP) to reduce utilization and to ensure load sharing over the network. Three scenarios were modeled and their performance efficiency was evaluated. A modeled computer Network with and without a fail Router under different scenarios and such Network was simulated with emphasis on the Application Performance. The Experiment was done for fifty workstations under three scenarios and these three scenarios were accessed and evaluated on experimental basis using Riverbed modeler to show the Effect of Application Network performance. The performance results show that increasing the bandwidth reduces utilization and also with the failure of one communication bandwidth, users can still access Network Application with a minimal cost.

**153-159**

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## **UNDERSTANDING CAUSES OF DISSATISFACTIONS AMONG COMPENSATED LANDOWNERS IN EXPROPRIATION PROGRAMS IN TANZANIA**

Cletus Ndjovu

Dissatisfaction of Project Affected People (PAPs) has been a common phenomenon worldwide and in most of the land acquisition programs carried out in Tanzania. The implementation of such programs has sometimes been delayed due to PAPs negative attitudes as a result of dissatisfactions. This has negative consequences for communities, acquiring authorities as well as program financers themselves. This study was aimed at finding out the causes, nature and levels of PAPs dissatisfaction in land acquisition programs executed at Kurasini area in Dar es Salaam, Tanzania. The study explored methods used to deal with compensation complaints and evaluated the reactions of PAPs towards the said programs. Through interviews and a review of documents submitted to the ministry responsible for land acquisition regarding their dissatisfactions, it was possible to undertake the analyses. It was evident from the study that inadequate compensations, non-adherence to the laws, unfavorable resettlement practices, use of force by governments and acquiring authorities in making PAPs accept compensation, and lack of PAPs involvement in the acquisition processes were identified as the most critical sources of discontent. Interviews also revealed that there were some dissatisfied PAPs who did not lodge complaints for a number of reasons but were equally dissatisfied for the same reasons. The study concludes up by recommending among others, that the government and the acquiring authorities should adhere to legal procedures governing compulsory purchase and compensation, ensure that negotiations are done with all parties involved in the acquisition programs, provide alternative plots besides monetary compensation, but after all recommendations, a plan for peaceful and agreeable resettlement of the PAPs is an initiative which would reduce or eliminate their resentments.

**160-172**

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## **GREEN MARKETING & CONSUMERISM**

Mohammad Jalalkamali, Masood Forooghi, Nima Nazeri

Green marketing is a progressive issue that most of its dimensions are unknown or intangible for consumers. In this review some of its aspects are surveyed considering its impact on consumers as a fundamental segment in economics. Also consumer behavior is defined and analyzed through its awareness of green marketing issue which causes purchasing decision.

**173-178**

## **INTENTIONAL ELECTROMAGNETIC INTERFERENCES IN COMMUNICATION DEVICES**

Md. Abdul Nabi, R. Jayalakshmi, Dr. K. Umapathy

"IEMI is the intentional generation of electromagnetic energy introducing noise or signals into electrical and/or electronic systems by interrupting, damaging and diverting these systems for jamming, terrorist or criminal [malicious] purposes."

**179-183**

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## **ACID HYDROLYSIS OF CASSAVA PEEL**

Onyelucheya Okechukwu Elechi, Nwabanne Joseph Tagbo, Onyelucheya Chioma Mary, Adeyemo Oluseun Emmanuel

The aim of this work is to study the hydrolysis process of cassava peel using phosphoric acid. The substrate was characterised using proximate analysis and result obtained showed that cassava peel has high hemicellulose content. The effect of process variables; acid concentration (2.5wt%, 5wt%, 7.5wt% and 10wt %) and time variation on glucose and xylose yield were studied. The maximum glucose was obtained as 2.218mg/ml at the following conditions: 7.5wt%, 1mins and 121°C while the maximum xylose was obtained as 33mg/ml under the following conditions; 10wt%, 3mins and 121°C. The Saeman's model and two-fraction were used to fit the experimental data for glucose and xylose yield and two-fraction model gave the best fit for both. In conclusion cassava peel as shown by the results obtained can be used for the production of glucose and xylose.

**184-187**

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## **DESIGN ANALYSIS AND APPLICATIONS OF A REGENERATIVE BICYCLE ERGOMETER**

Chukwuneke J. L., Ugwuegbu D. C., Sinebe J. E., Enyi L. C.

Man needs to do some form of physical work in other to remain healthy, this work is similar to the work done by any machine or equipment and thus should be channeled to give useful output, but rather, it is usually dissipated into the environment in form of heat. The regenerative bicycle ergometer takes advantage of the greater power generated by the limbs and arms, thus conserves, converts and stores the energy dissipated by the rider with an ideal mechanical advantage of 7.6, it strategically uses simple mechanisms to magnify its work and then converts this mechanical energy into electrical energy by the use of a dynamo, with a speed ratio of 108.5 and a transmission efficiency of 89%, the rider pedals 27rpm to obtain the dynamo's rated input of 2600rpm, giving an output of 12.6volts. The regenerative bicycle ergometer is designed and constructed to perform all the core functions of a bicycle ergometer, having an allowable load of 116.5kg and a maximum resistance of 65.33N which is equivalent to a mass of 6.66kg. The energy converted is stored in a 12volts battery, making its use flexible, clean and meeting the energy demands of man.

**188-194**

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## **HAND DETECTION USING HSV MODEL**

uzma noreen,mutiullah jamil, nazir ahmad

Natural Human Computer Interaction (HCI) is the demand of today's technology oriented world. Detecting and tracking of face and hands are important for gesture recognition. Skin detection is a very popular and useful technique for detecting and tracking human-body parts. It has been much attention mainly because of its vast range of applications such as, face detection and tracking, naked people detection, hand detection and tracking, people retrieval in databases and Internet, etc. Many models and algorithms are being used for detection of face, hand and its gesture. Hand detection using model or classification is to build a decision rule that will discriminate between skin and non-skin pixels. Identifying skin color pixels involves finding the range of values for which most skin pixels would fall in a given color space. All external factors will be eliminated to detect the hand and its color in the image in complex background.

# Comparison Of Antibacterial Effects Between Aloe Vera And Sodium Fluoride On The Amount Of Streptococcus Mutans Colony (ATCC) In Vitro

Yetty Herdiyati Nonong, Arya Arta Augusta, Mieke Hemiawati Satari, Willyanti Soewondo

**Abstract:** Streptococcus mutans is a bacterium that plays an important role in the process of caries. These bacteria can produce glucosyltransferase (GTF) enzymes which can change the disaccharide, particularly sucrose into glucan that serves as a medium for the initial attachment of bacteria to the tooth surface and produce acids in the metabolic process which is the beginning of dental caries. Aloe vera is natural materials that has a lot of active substances that contains antibacterial effects. Sodium fluoride is a material commonly used in the prevention of caries, serves to remineralization of the teeth and has anti-bacterial properties. The purpose of this study was to analyze differences in decline in the number of colonies of Streptococcus mutans after in vitro administration of Aloe vera and Sodium Fluoride. This research was conducted using pure experimental research on the media containing artificial saliva, enriched with sucrose and the culture of Streptococcus mutans (ATCC 25 175) was incorporated in it. Samples are given treatments of Sodium Fluoride and Aloe vera extracts to see the difference in the number of bacterial colonies. Statistical analysis uses the t test to see a decrease in the number of colonies of Streptococcus mutans between treatment Aloe vera and Sodium Fluoride. T-test equality of two mean the two populations doesn't show a significant difference between the decline in the group of Aloe vera and Sodium Fluoride group, with p-value of 0.2144. This study concludes that there is no difference in the decreasing in the number of colonies of Streptococcus mutans significantly after in vitro administration of Aloe vera and Sodium Fluoride.

**Index Terms:** Streptococcus mutans, Aloe vera, sodium fluoride, antibacterial effects, glucosyltransferase enzyme, caries, remineralization

## 1 INTRODUCTION

Dental caries is a chronic multifactorial disease which is a progressive demineralization in hard tissue of the tooth surface by acid derived from the fermentation of food waste that accumulates on the tooth surface.<sup>1</sup> Caries process involves many factors and one of them is bacteria. Streptococcus mutans is a bacterium that is most responsible in the process of caries and is a highly cariogenic bacterial pathogens with high asidogenik level so that it can destroy the hard tissue of the tooth.<sup>[1],[2]</sup> Streptococcus mutans is a bacterium capable of breaking down sucrose into glucan and fructan that can be fermented by bacteria to acid. Fermented acid irritates the outer surface of the tooth and enamel demineralization is the beginning of dental caries.<sup>[3]</sup> Various ways and materials to prevent caries has been widely studied. One of them was Miller in 1890 who stated that the antiseptic ingredient could kill or reduce the number and activity of bacteria. Antiseptic ingredients can be used to eliminate the accumulation of biofilm and can even damage the bacterial cell.<sup>[4]</sup> Fluor has long been used as the gold standard in caries prevention. Fluor is safe and effective in preventing and controlling dental caries.<sup>[5]</sup> Application of topical fluoride can reduce the incidence of caries by preventing the demineralization of enamel, enhancing remineralization of enamel lesions and inhibiting the activity of bacterial enzymes.<sup>[6]</sup> Fluor is a halogen agent which can inhibit the use of carbohydrate by bacteria to resist the enzymes used in the process of glycolysis so that fluor acts as a bacteriostatic agent.<sup>[7]</sup> Herbal ingredients are widely used as an alternative material in the field of health. Aloe vera is one of the herbal ingredients that has many health benefits because of its many benefits. Aloe vera contains many active substances including amino acids, anthraquinone, enzymes, minerals, vitamins, lignin, monosaccharide, polysaccharide, salicylic acid, saponins, hormones, tannins, lectin, and sterols.<sup>[8],[9],[10],[11]</sup> Anthraquinone is a phenol compound contained in Aloe vera. Low concentrations of phenolic compounds can inhibit the growth of bacteria by causing lysis of bacterial cells.<sup>[10],[12]</sup> It

can be applied to the prevention of caries with one of the main factors that cause caries is bacteria.

## 2. RESEARCH METHOD

The study was conducted at the Laboratory of Chemistry Faculty of Mathematics and Natural Sciences Universitas Padjadjaran in media containing artificial saliva, enriched with sucrose and fed cultured Streptococcus mutans ( ATCC 25 175 ) in it . Samples are given treatments of Sodium Fluoride and Aloe vera extracts to see the difference in the number of bacterial colonies. The samples were divided into 6 groups of NaF - 1 ( NaF day 0 ), NaF - 2 (NaF day 1), NaF - 3 (NaF day 2), AV - 1 (Aloe vera day 0), AV - 2 (Aloe vera day 1), AV - 3 (Aloe vera day 2). In this study, differences in the number of colonies of Streptococcus mutans were calculated using colony counting method by means of colony counter and expressed with a numerical scale and units of CFU / mL in dilution 10<sup>-3</sup> to 10<sup>-6</sup> with the Duplo replication on Muller Hinton agar medium enriched with sucrose 20 %. Examination of the number of colonies of bacteria Streptococcus mutans was performed after 1 hour incubation at group NaF - 1 and AV - 1. At group NaF - 2 and AV - 2, examination was performed after 1 day of incubation , and after 2 days of incubation in group NaF - 3 and AV - 3. Prior to this research, the Minimum Inhibitory Concentration checks have been conducted on Aloe vera extract and Sodium Fluoride. This is done to determine the most minimal concentration in material or extracts to be used to inhibit the growth of colonies of Streptococcus mutans. Minimum Inhibitory Concentration Test results on Aloe vera extract is 18.75 % and the examination results on the Minimum Inhibitory Concentration Sodium Fluoride is 1250 ppm. Aloe vera used in this study were taken from the plants cultivation area in the Chemical Laboratory of the Faculty of Mathematics and Natural Sciences Universitas Padjadjaran. This plant has been identified as Aloe barbadensis Miller or Aloe vera. The manufacture of Aloe vera extract is done in Laboratory of Chemistry Faculty of Mathematics and Natural Sciences Universitas Padjadjaran.



### 3 STATISTIC TEST

Results of the study will be tested statistically using t test to see equality between Aloe vera and Sodium Fluoride based on a decrease in the number of colonies of Streptococcus mutans.<sup>13</sup>

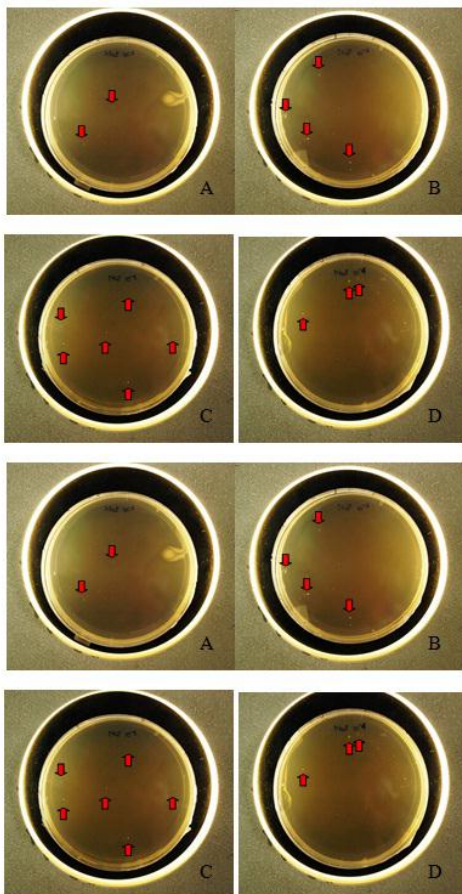
### 4 RESULTS

**Table 1.** Examination of Number of Streptococcus mutans colonies of group Sodium Fluoride ( in CFU / mL )

Dilution Concentration	Natrium Fluorida 0 day	Natrium Fluorida 1 day	Natrium Fluorida 2 days
	The average number of colonies	The average number of colonies	The average number of colonies
10 <sup>-3</sup>	3		0
	4,5	0	1
	1,5		0
	0		0

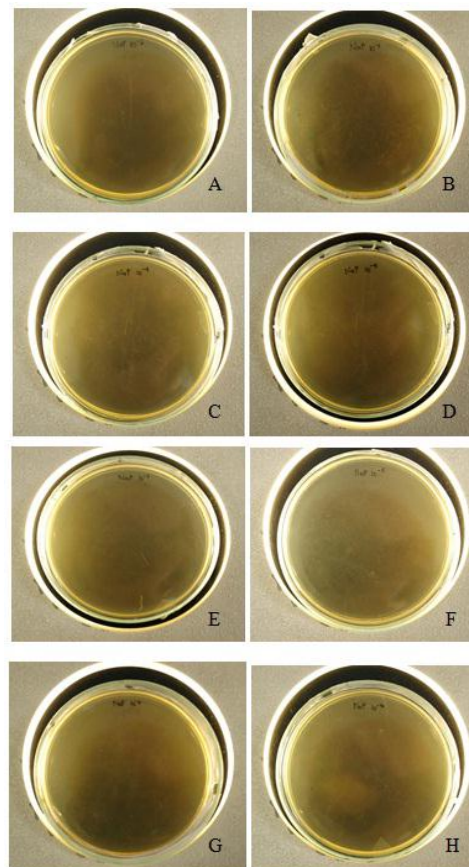
Research result on Sodium Fluoride group showed a decrease in the number of colonies ranging from day 0 to day 1. Day 2 after treatment showed stable results when compared to day 1 despite the growing colonies of Streptococcus mutans.

concentration of 10<sup>-4</sup> also showed colonies that grow as much as 6 CFU / ml on the first agar plate first and 3 CFU / ml on the second agar plates. At a dilution concentration of 10<sup>-5</sup>, the colonies are still visible as much as 2 CFU / ml on the first agar plate and 1 CFU / ml on the second agar plates.



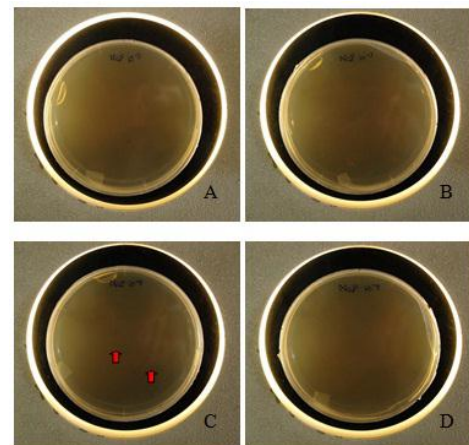
**Figure 1.** NaF agar plate 0 day

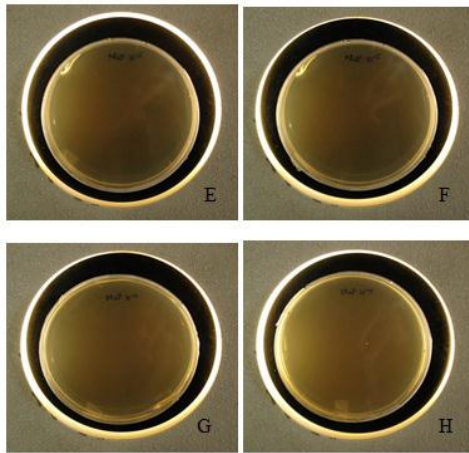
Day 0 indicates there are colonies that grow at dilution concentrations of 10<sup>-3</sup> as much as 2 CFU / ml on the first plate and 4 CFU / ml on the second agar plates. At a dilution



**Figure 2.** NaF agar plate 1 day

One day after the treatment showed that no colonies grew on agar plate for each dilution concentration.





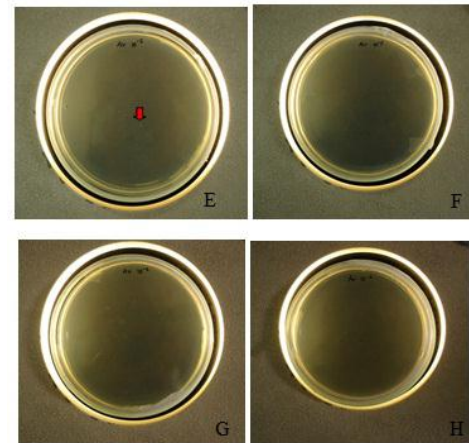
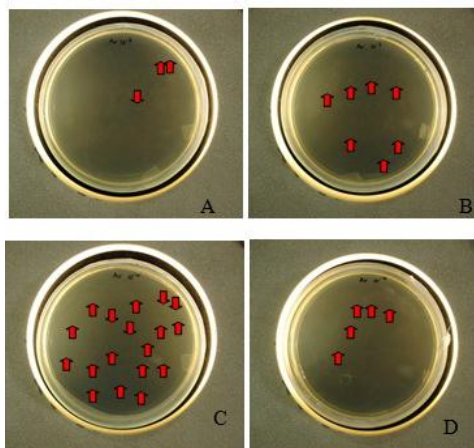
**Figure 3.** NaF agar plate 2 days

Day 2 overall showed good results in a decrease in the number of colonies of Streptococcus mutans. However, the dilution concentration of  $10^{-4}$  on the first agar plate still shows Streptococcus mutans colonies that grow on as many as 2 CFU / ml.

**Table 4-4** Examination of Number of Streptococcus mutans colonies of group Aloe vera (in CFU / mL)

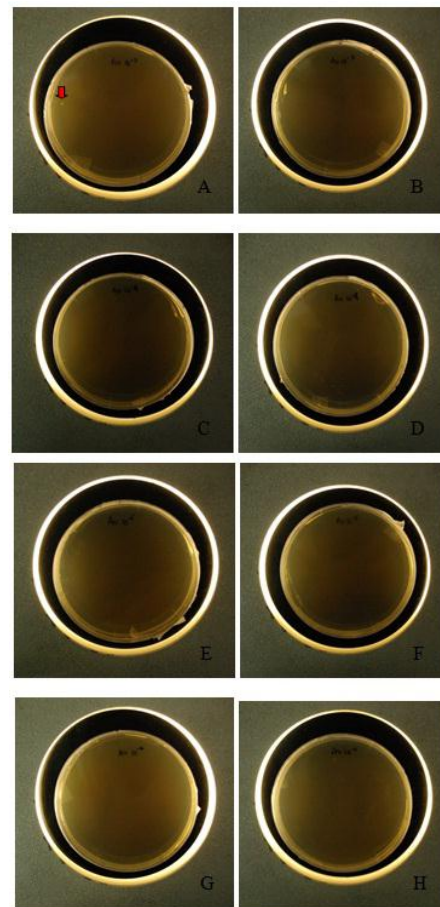
Dilution concentration	Aloe vera 0 day	Aloe vera 1 day	Aloe vera 2 days
	The average number of colony	The average number of colony	The average number of colony
$10^{-3}$	5	0,5	0
$10^{-4}$	11,5	0	0
$10^{-5}$	0,5	0	0
	0	0	0

Research result on Aloe vera group showed relatively more colony growth than the Sodium Fluoride group.



**Figure 4.** Aloe vera agar plate 0 day

Day 0 showed colonies that grew at dilution concentrations of  $10^{-3}$  as much as 3 CFU / ml on the first agar plate and 7 CFU / ml on the second agar plate. At a dilution concentration of  $10^{-4}$  the colony grew as much as 18 CFU / ml on the first agar plate and 5 CFU / ml on the second agar plate. At a dilution concentration of  $10^{-5}$ , the colonies grew as much as 1 CFU / ml on the first agar plate.



**Figure 5.** Aloe vera agar plate 1 day

Day 1 show good results with a decrease in all dilution concentrations. Colony growth only occurred on the first agar plate at a dilution concentration of  $10^{-3}$  as much as 1 CFU / ml.

On the other dilution concentration, the plate looked clean and it signifies that there was no colony growth.

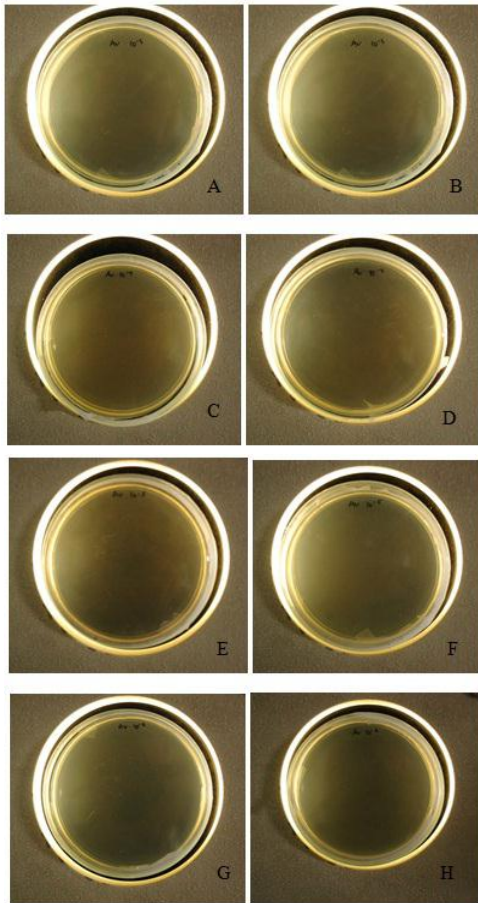


Figure 6. Aloe vera agar plate 2 days

Day 2 showed that the decrease in the number of colonies was good with no colonies growing on each dilution concentrations. It can be seen with the clean plates at each concentration dilution that were planted.

4.1 Statistic Test Results

Statistical test used t test equality of two mean of the two populations to determine the difference in decreasing the number of colonies of Streptococcus mutans after the administration of Aloe vera and Sodium Fluoride with  $\alpha < 0.05$ .

Table 3. T test analysis to determine the average of the number of Streptococcus mutans colony after Aloe vera and Sodium Fluoride treatment

	Pvalue			Value t <sub>count</sub>	Means
	NAF0 and NAF1	NAF0 and NAF2	NAF1 and NAF2		
AV0 and AV1	0,2144			0,82	Non Significant
AV0 and AV2		0,1663		1	Non Significant
AV1 and AV2			0,3308	-0,45	Non Significant

In the statistical test with t test, a significant difference was not seen between the average number of Streptococcus mutans colony in the Sodium Fluoride group day 0 and 1 with a mean number of Streptococcus mutans colony in the Aloe vera group day 0 and 1, with p value 0.2144 and tcount 0.82. On the average number of Streptococcus mutans colony in the Sodium Fluoride group day 0 and -2 with the average number of Streptococcus mutans colony in the Aloe vera group day 0 and 2, a significant difference was not seen with p value 0.1663 and tcount 1. In the mean number of Streptococcus mutans colonies in the Sodium Fluoride group day- 1 to -2 with the average number of Streptococcus mutans colonies in the Aloe vera groups day-1 to 2, a significant difference was not seen with p value of 0,3308 and tcount -0.45. Conclusion : there is no significant differences in the decrease in the number of Streptococcus mutans colonies after treatment Aloe vera and Sodium Fluoride.

5. DISCUSSION

Streptococcus mutans is a bacteria that has an important role in the caries process. One of the cariogenic properties owned by these bacteria are the ability to produce an enzyme called extracellular glucosyltransferase (GTF). These enzymes convert the disaccharide, particularly sucrose into glucan which is a component that serves as a medium for the initial attachment of bacteria to the tooth surface, facilitating the accumulation of bacteria and are useful in the process of metabolism that produce acid.<sup>14</sup> Streptococcus mutans is able to attach to the surface of the pellicle on the tooth enamel and synthesize polysaccharide which is an important factor in the formation of caries.<sup>[14,15]</sup> This study was conducted to determine the decrease in the number of Streptococcus mutans colonies in vitro after treated with Sodium Fluoride and Aloe vera then incubated for 0-2 days at a temperature of 37°C with anaerobic conditions. Times of 0-2 days is used based on the preliminary research that has been done before. In the preliminary research incubation was for 3 days and the result showed no colonies growing on both materials that were applied. To know the process of reduction of the number of colonies, the examination was carried out starting from day 0 to day 2 to get more detailed data from a decrease in the number of colonies after administration of Aloe vera and Sodium Fluoride. The concentration of Sodium Fluoride and Aloe vera used are based on the results of the examination conducted by Minimum Inhibitory levels before the study began. Of the examination, Minimum Inhibitory Levels of Sodium Fluoride for 1250 ppm (1.25 %) and the minimum inhibitory concentration of Aloe vera extract of 18.75 % is obtained. Streptococcus mutans colony was calculated by the counting colony method with a colony counter equipment and expressed with a numerical scale and units of CFU / mL in dilution of 10<sup>-3</sup> to 10<sup>-6</sup>. The concentration of sucrose used on agar plates and the media is 20%<sup>[16]</sup> It is intended so the bacteria can grow well and have a fairly large colony to facilitate the colony counting process later. This is consistent with previous studies conducted by Hasslof et al, but the agar media used are different in this study. The Agar Media used in this study is Muller Hinton whereas Hasslof research used TYBS20. In the group of Sodium Fluoride, a pretty good decrease in the number of colonies happens from day 0 to day 2. It can be proved that Sodium Fluoride has antibacterial properties with a decrease in the number of colonies of Streptococcus mutans. The decrease is due to the mechanism

of fluoride that can inhibit enzymes needed by *Streptococcus mutans* to metabolic processes. Fluor can intervene in glucose transport into the cell through a system of phosphoenolpyruvate (PEP) –dependent phosphotransferase (PTS), because PEP is formed by 2-phosphoglycerate through the action of enolase sensitive fluor.<sup>[17]</sup> Enolase is an enzyme used in the process of glycolysis in turn 2 Phosphoglyceric be fosfofenolpiruvat.<sup>[18]</sup> Inhibition of this enzyme activity causes the transport of glucose 6 phosphate disrupted so that the metabolic processes of bacteria into terganggu.<sup>[18]</sup> Disruption of this metabolic process will lead to a lack of nutrition for the bacteria so that the growth of bacteria will be disturbed and decreased the number of colonies. Fluor is also capable of inhibiting another enzyme system required by *Streptococcus mutans* in the process of glycolysis which is glucosyltransferase and fruktosiltransferase.<sup>[19],[20]</sup> In addition, Sodium fluoride may also interfere with intracellular polysaccharide synthesis thus limiting the supply of nutrients for the *Streptococcus mutans*.<sup>[19]</sup> Aloe vera group also showed good results in a decrease in the number of colonies from day 0 to day 2. This decrease in the number of colonies proves that Aloe vera also has antibacterial properties. Aloe vera is a natural ingredient of which has many benefits for human health. This material has many active substances that has anti-bacterial capabilities, such as anthraquinone and quinone. Anthraquinone and quinone contained in Aloe vera have antibacterial effects antibakteri.<sup>[21]</sup> This antibacterial effect works by blocking the action of an enzyme in the biosynthetic process peptidoglycan and lipopolysaccharide / lipotekhoat, damaging the plasma membrane and causes disruption of membrane permeability so that bacteria growth can be inhibited.<sup>[12]</sup> Anthraquinone also have similar properties with soaps that can lower the surface tension of the cytoplasmic membrane of the bacterial cell so that the cell membrane permeability down. Saponin-containing glycosides can dissolve lipids in the cell membrane of bacteria (lipoproteins), thus making the surface tension of lipid to be down, and cause bacterial cell function becomes abnormal, lysis and mati.<sup>[12]</sup> The ability of anti-bacterial causes a decrease in the number of colonies of *Streptococcus mutans*. Other ingredients such as acids aloetik has the effect of a natural antibiotic that works synergistically with barbaloin, isobarbaloin, and aloe-emodin.<sup>[22]</sup> Aloe-emodin has polyphenolik structure that is able to inhibit the protein synthesis of the bacterial cell, so that it works as an antibacterial and antiinflamasi.<sup>12</sup> This is similar to research conducted Fani and Kohanteb 2011. The research states that Aloe vera most effectively inhibit *Streptococcus mutans* compared with *Aggregatibacter actinomycetemcomitans*, *Porphyromonas gingivalis*, *Bacteroides fragilis* with a minimum inhibitory concentration of 12.5%, the width of inhibition zone of 10mm.<sup>[22]</sup> Another study conducted by George et al, suggests that Aloe vera in gel form have the same effectiveness with a toothpaste containing fluoride on bacteria growth *S.mitis*.<sup>[23]</sup> Statistically, a decrease in the number of colonies on Aloe vera group has no significant difference with a decrease in the group of Sodium Fluoride or in other words a decrease in the number of colonies of *Streptococcus mutans* in vitro is equivalent. This shows that Aloe vera has antibacterial capabilities similar to Sodium Fluoride. The use of Aloe vera as an alternative material to reduce the rate of growth of *Streptococcus mutans* is an effective step in the effort to reduce the rate of occurrence of dental caries. This material is also a natural substance that has many properties

and are easily found in the environment around us. However, the use of Aloe vera can not be used as a single agent in caries prevention measures as Aloe vera does not have any effect on the remineralization of teeth. The combination of Aloe vera with Sodium Fluoride may produce a material that can provide better results in prevention of caries because it has antibacterial capability and power remineralization of teeth. Levels of use of Aloe vera should also be considered as Aloe vera has a laxative effect which can irritate the digestive system when overly consumed.<sup>[12]</sup>

## 6 CONCLUSION

Based on these results it can be concluded that there was no significant difference in decreasing the number of colonies of *Streptococcus mutans* after administration of Aloe vera and Sodium Fluoride. In other words, Aloe vera has anti-bacterial capabilities equivalent to Sodium Fluoride in terms of decreasing the number of colonies of *Streptococcus mutans*.

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