PANDIAN SARASWATHI YADAV ENGINEERING COLLEGE
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The number of research papers published per teacher during the academic year 2022 – 2023

Sl.no	Title of paper	Name of author/s
1.	The absorption behaviour of biochar derived from Prosopis juliflora with surface modified by KOH against Allura red dye	V. Murali
2.	Study on hydrogeochemical assessment, groundwater quality index for drinking, seawater mixing index and human health risk assessment of nitrate and fluoride	V. Murali
3.	An IOT based system monitoring crop Fertilization	R.Raja, S.Regina, N.Ezhilmathi, C.Murugan
4.	Topic Profile based learning Materials Retrieval using LDA	K.R.Premlatha, R.Raja, S.Regina
5.	Developing an Embedded Vehicle Accident Alert system : Black Box Design	R.Raja, S.Regina, K.R.Premlatha
6.	Monitoring streetlight using IOT Technology to detect fault automatically	R.Raja, S.Regina
7.	A Review paper on Characteristic study of plastic waste for construction Industry	M.kasthuri,G.Ragha Dharini,M.Shanmugapriya
8.	A Review on Sewage Waste Water Treatment in Disarray of Madurai	M.Kasthuri
9.	Dental Caries Detection using NIR Images with Encoder Modified U-Net and Feature Pyramid Network	R.Raja, S.Regina, N.Ezhilmathi, C.Murugan
10.	Evaluation of chlorination and chloramination to degrade the Endocrine Disruptor Compounds in ground water	V.Murali, C.Murugan, P.Saravanan
11.	Investigations on Silicon Carbide Reinforced High Entropy Alloy (CoCrNiMnFe) matrix Composites Produced by Powder Metallurgy Process	S.Rajamuneeswaran

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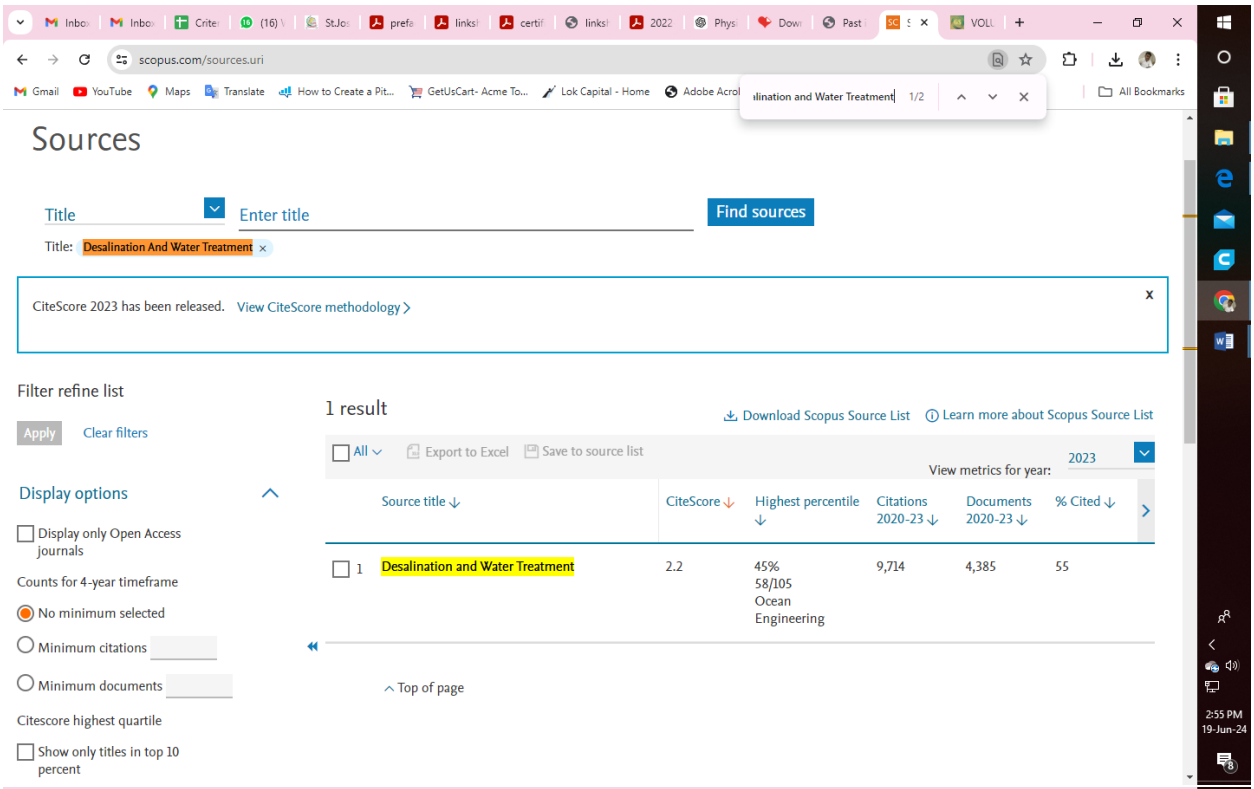

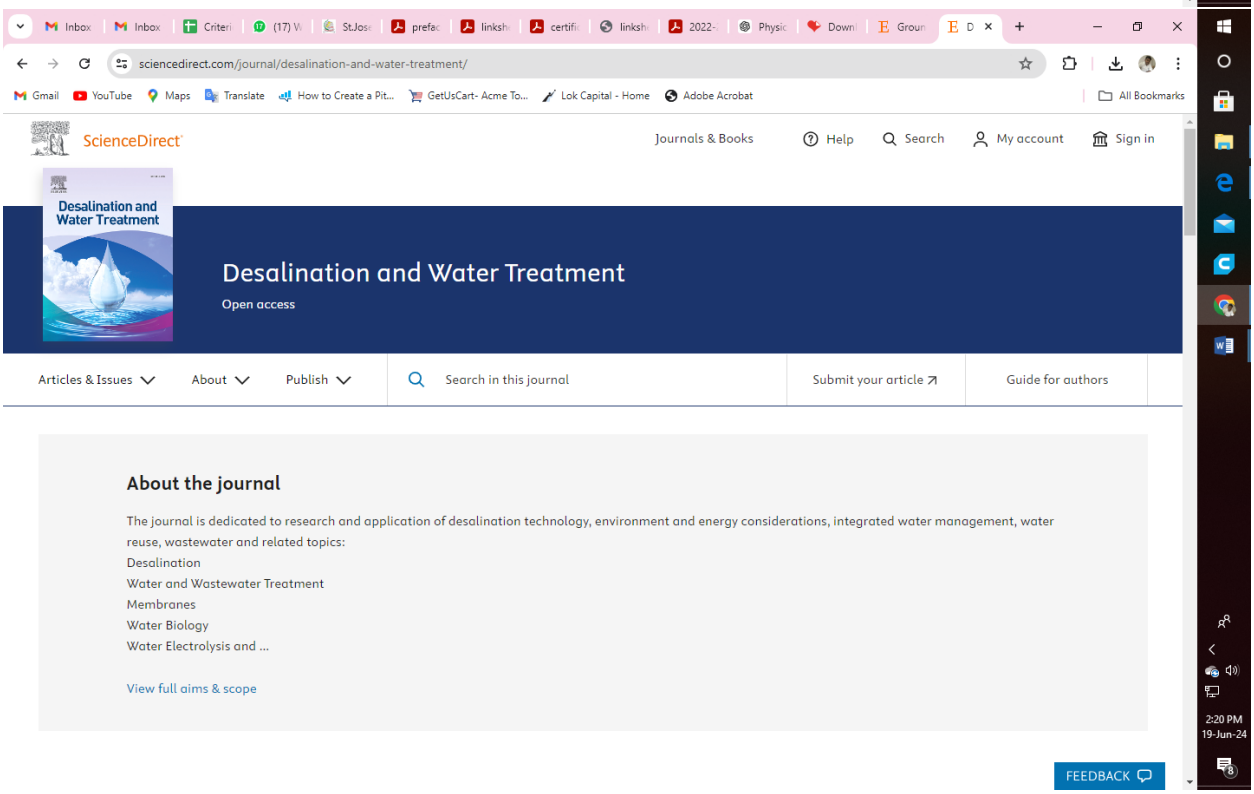

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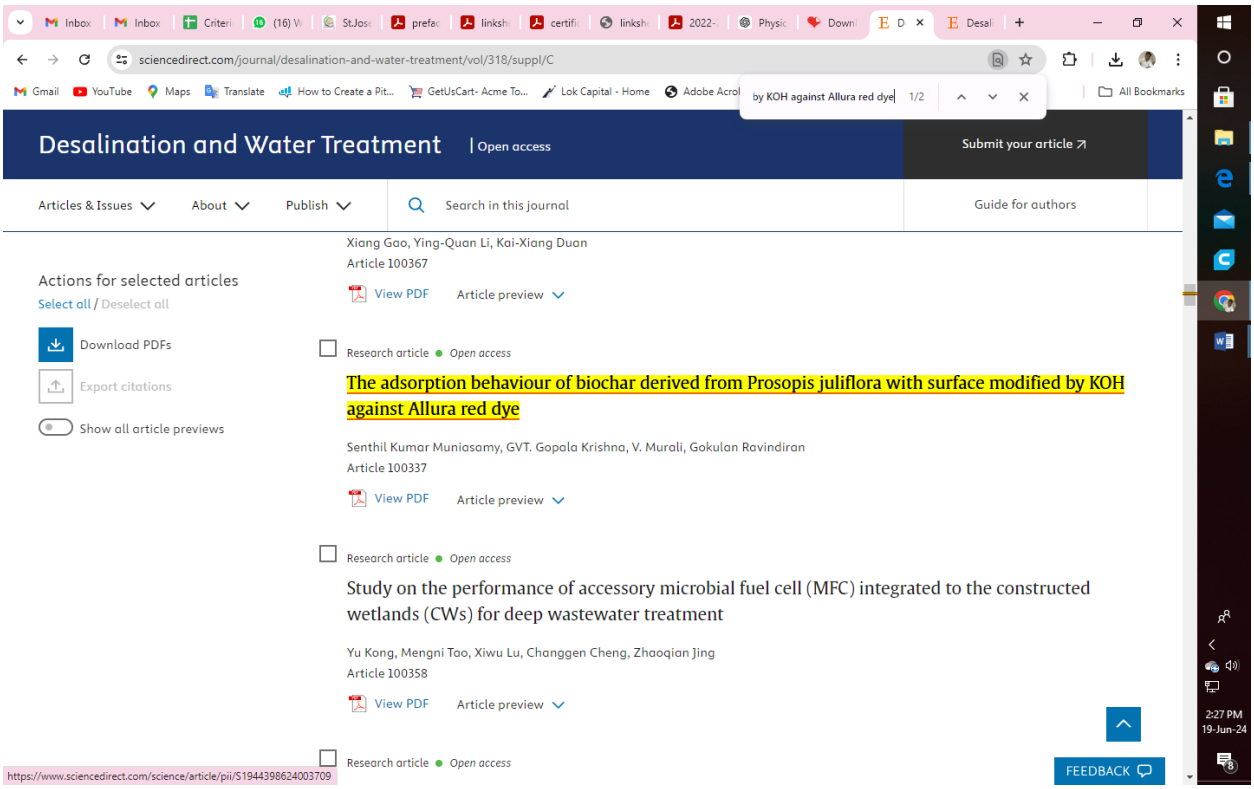

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Desalination and Water Treatment 318 (2024) 100337

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Desalination and Water Treatment

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The adsorption behaviour of biochar derived from Prosopis juliflora with surface modified by KOH against Allura red dye

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ARTICLE INFO

Key words:
ProsopisJuliflora
Allura Red dye
Adsorption
Surface modification

ABSTRACT

This study examined the efficacy of ProsopisJuliflora with surface changes as a bioadsorbent for the removal of Allura Red dye. The effects of adsorptive dosage, pH, and contact period with starting dye attentiveness on adsorption were examined in the batch adsorption study. The study demonstrated that the Allura Red dye may be absorbed by surfaces that had been treated with KOH compound.The percentages of Allura Red dye eliminated were 67.18 %, 75.88 %, and 94.37 %, respectively. UV–visible adsorption spectroscopy is used to quantify the extent of dye decolorization. The modified surface characteristics of the adsorbent produced by ProsopisJuliflora were reported using XRD, FTIR, and SEM. The Adams-Bohart mathematical models are employed in the computation and assessment of adsorption efficiency. The adsorption-derived R^2 values for the equilibrium isotherm data model were 94.63, 86.67, and 96.35. Diffusion and intraparticle regeneration were investigated to bolster the adsorption investigation.

1. Introduction

In tanneries, paper and pulp mills, textile manufacturing industries, and dye production companies, the use of synthetic dyes has grown.Because it discolours the water, dye pollution is viewed as an unpleasant type of pollution in aquatic ecosystems [1]. The reason these hues molecules have negative charges when they separate in water is why these dyes were dubbed anionic dyes.These dyes imperil the local population and the aquatic ecology by prohibiting sunlight from entering surface water [2]. Textile wastewater needs to be adequately handled to protect the environment and ecosystem.The complex aromatic molecular structures found in dyes typically contributed to their stability and increase their resistance to biodegradation [3]. Allura Red AC (E129) has chromophore qualities because of the azo group, which is linked to the auxochrome hydroxy and methoxy groups by aromatic -system rings. Allura Red dye used to provide food, cosmetics, garments, and drugs an alluring red appeal [4]. However, it has been demonstrated that red dyes and their metabolites may be hazardous to human health and raise the risk of cancer in dye workers.Allura dye hence genotoxic, mutagenic, carcinogenic, and fatal to animals as well as humans [5]. The uncontrolledproclamation of Allura tints into the atmosphere, particularly from the textile industry, poses serious risks to both human health and the ecosystem [6]. Adsorption was one of the unit techniques applied in the chemical engineering field to purify wastewater from the textile industry. Conventional methods for diminishing color include membrane separation, ozonation or oxidation, flocculation, and coagulation [7]. However, these technologies are rarely used due to their high cost and limited commercial feasibility. Chemical oxidations on an industrial scale are generally impractical [8]. On the other hand, an adsorption technique is the most widely used and versatile. The best caliber treated effluent is generated by an adsorption system that is properly built. Under typical biological and physical circumstances, most dyes are non-oxidizable compounds [9]. It has been found that biochar, a naturally occurring material that has been chemically and carbonized, is an affordable adsorbent that may be used for physisorption dye removal treatment [10]. This biocharhas short sorption periods, a rapid breakthrough time, and poor adsorption capabilities. To solve these issues, the biochar material's surface is modified to create a charged surface of immobilized functional groups that have a strong and specific affinity for removal and to eliminate functional groups that obstruct the dye components' ability to adsorb [11]. These functional groups are the result of a chemical interaction between the radicals provided by the chemical agent used for the modification and the adsorbent carbon network [12]. The biochar's

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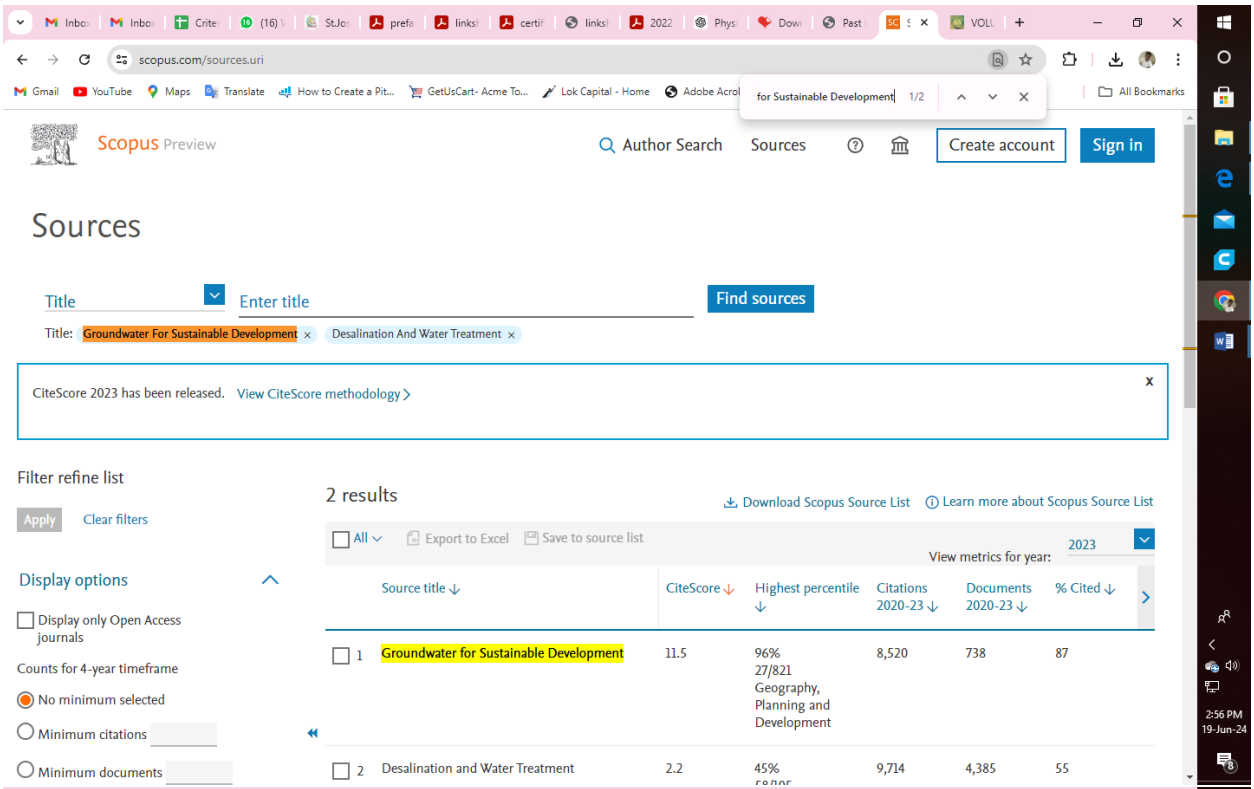

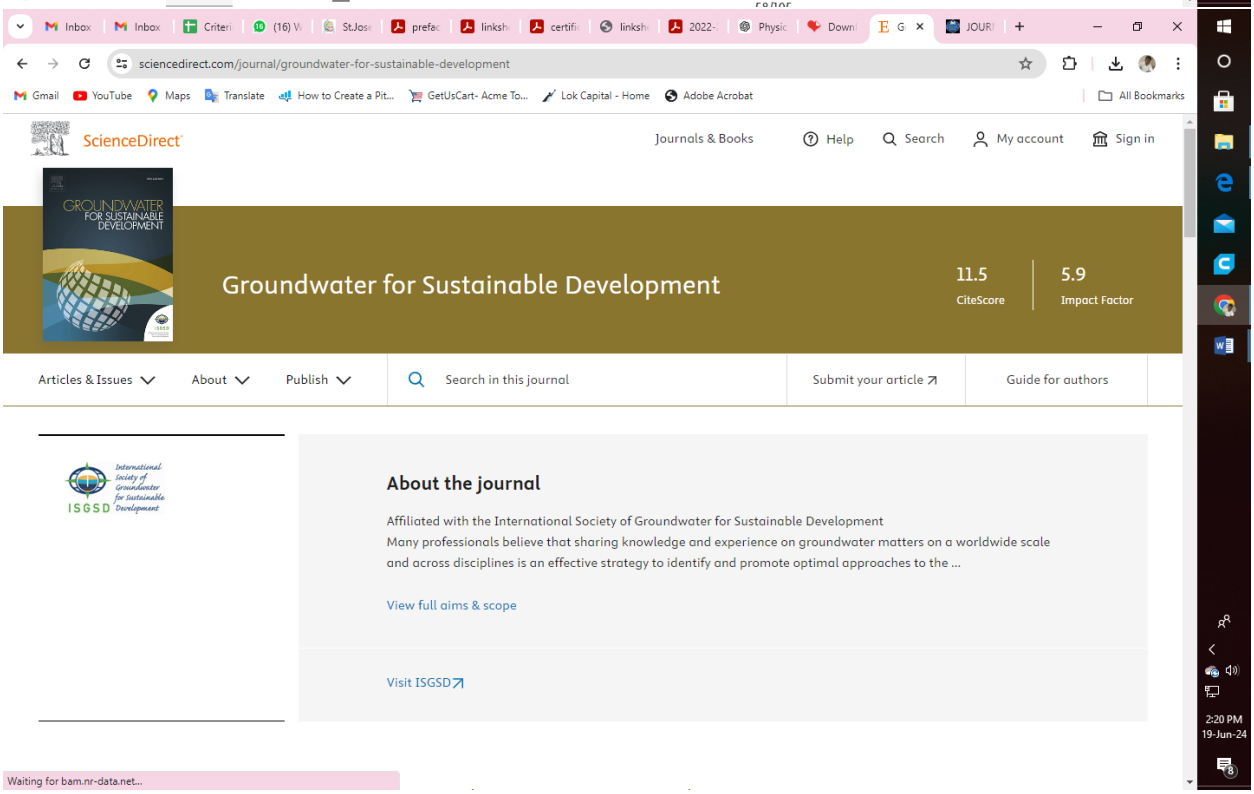

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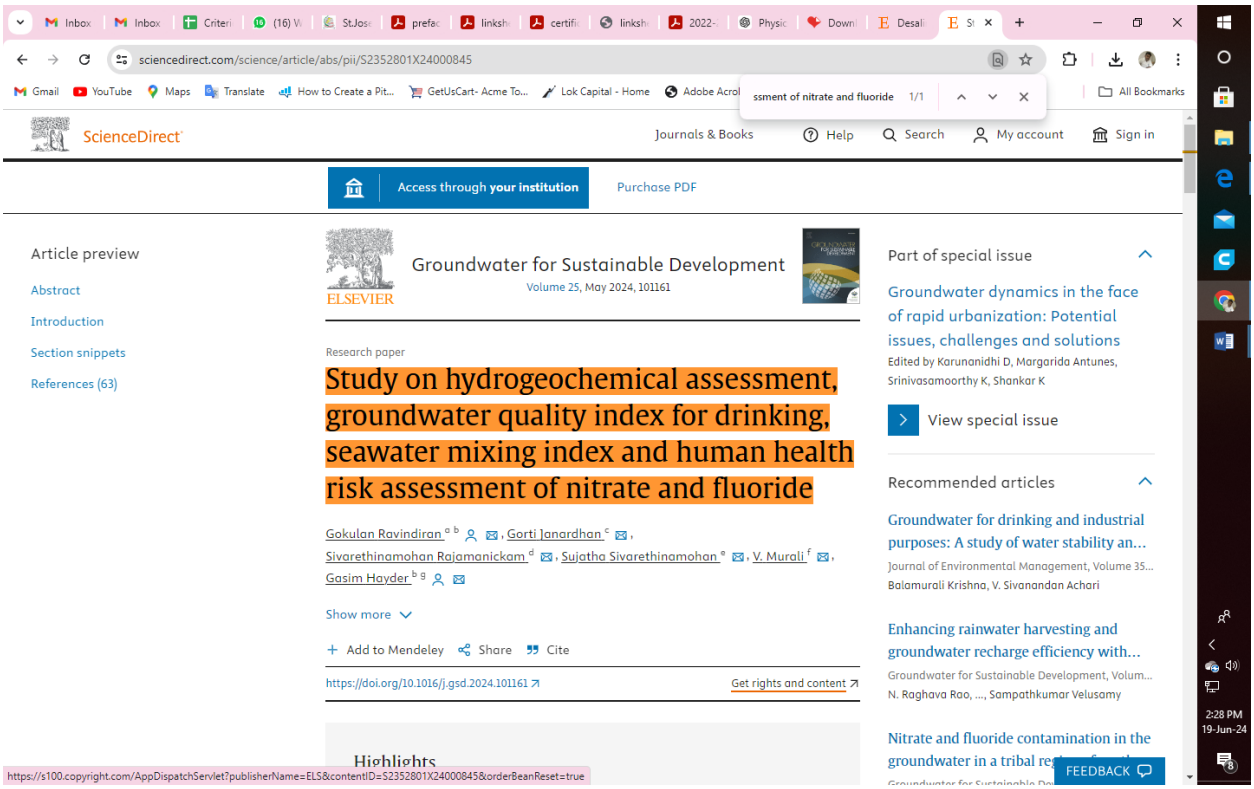

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Research paper

Study on hydrogeochemical assessment, groundwater quality index for drinking, seawater mixing index and human health risk assessment of nitrate and fluoride

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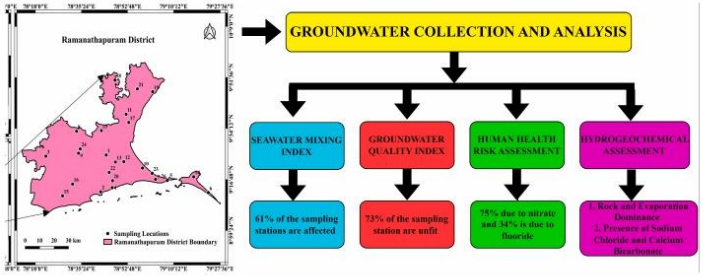
HIGHLIGHTS

- 73% of the sampling station's groundwater was unfit for drinking purposes.
- T_{Na}, T_{Mg}, T_{Cl}, and T_{SO4} were obtained as 196, 85, 248, and 200 mg/L respectively.
- 61% of the sampling station's groundwater was affected due to seawater intrusion.
- HHRA study confirmed that adults and children are having a health impact.

GRAPHICAL ABSTRACT



ARTICLE INFO

Keywords:
Climate action
Clean Water and sanitation
Human health risk assessment
Seawater mixing index

ABSTRACT

The present study examined the impact of groundwater quality on drinking and irrigation purposes in the coastal district Ramanathapuram of Tamil Nadu State of Indian country. A total of 26 sampling stations were studied to examine the groundwater water quality index (WQI) using the water quality analysis. Out of 26 stations, it was observed that 19 stations' groundwater was unfit (WQI>100), 5 stations was very poor (WQI: 76-100), and 2 stations were poorly (WQI:51-75) affected and not suitable for drinking purposes. The Seawater Mixing Index (SMI) was also studied to understand the seawater intrusion into the groundwater and 61% of the sampling stations' SMI values were above 1 confirming the seawater intrusion into groundwater. The study also examined

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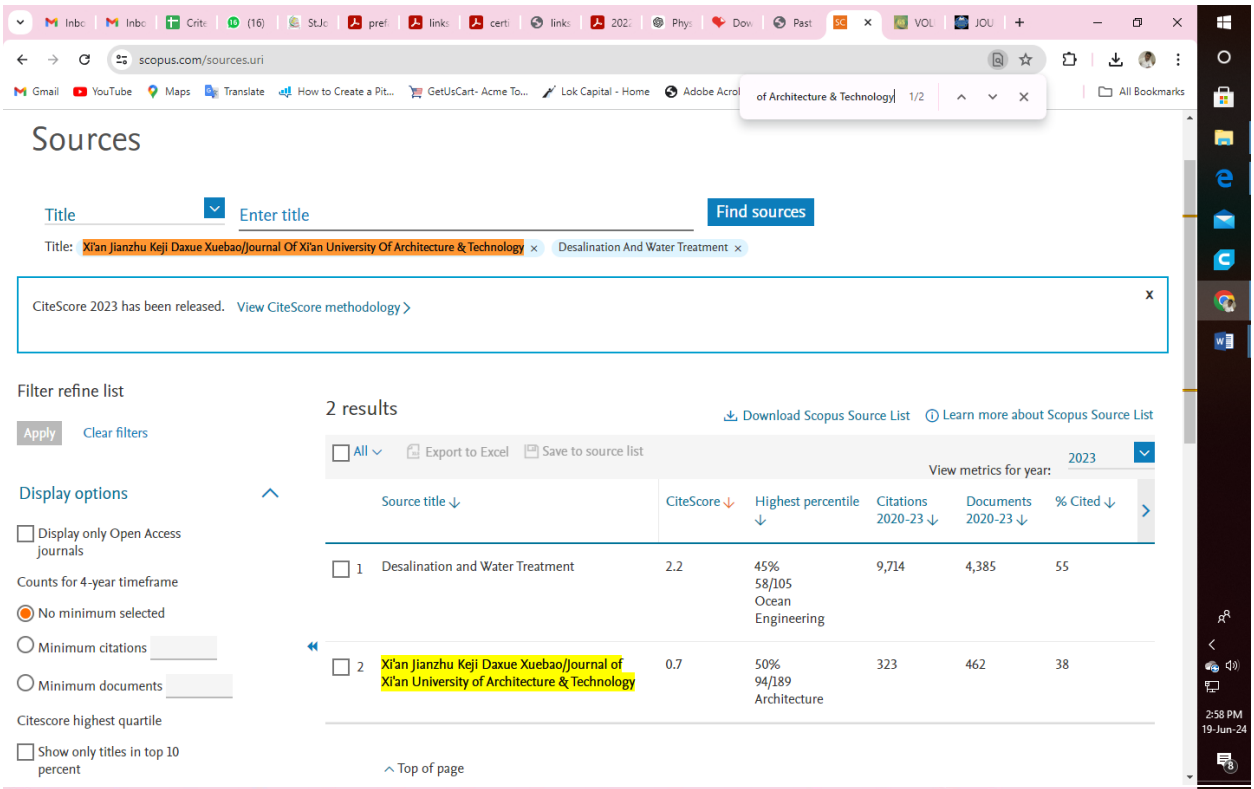

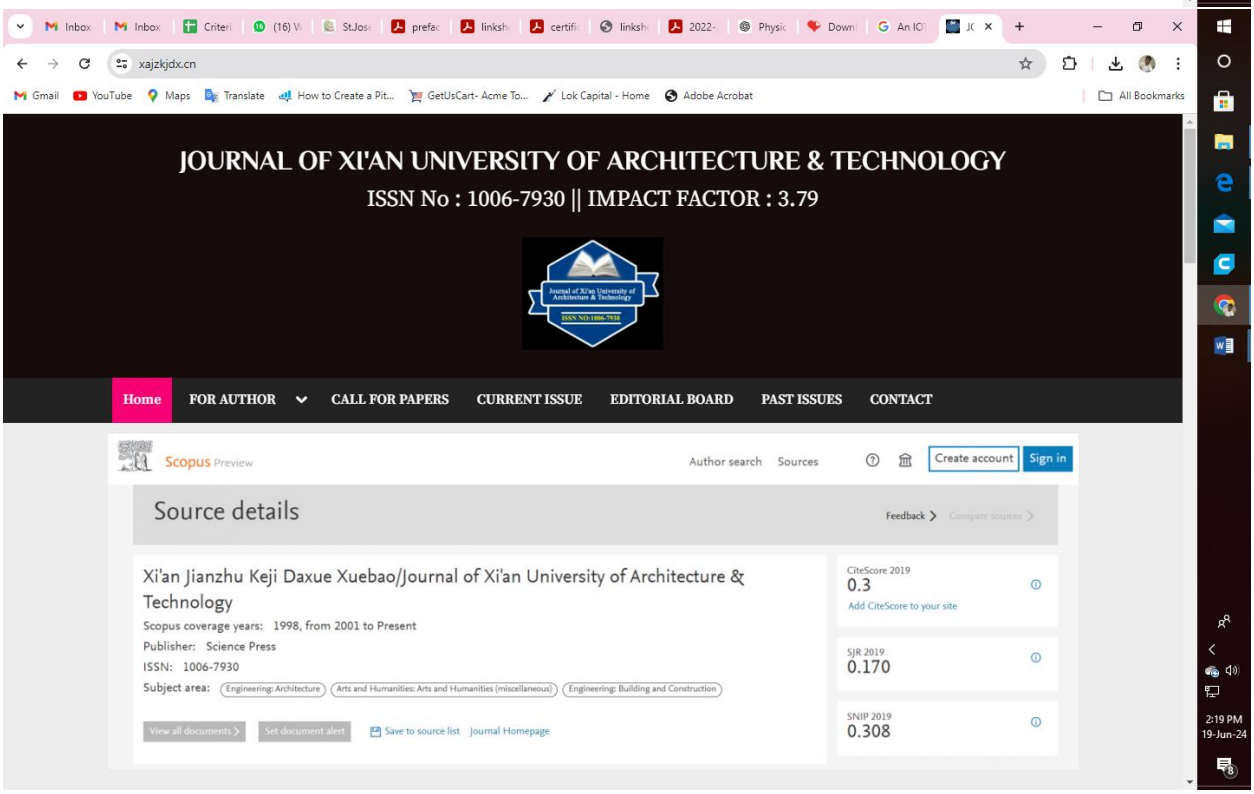

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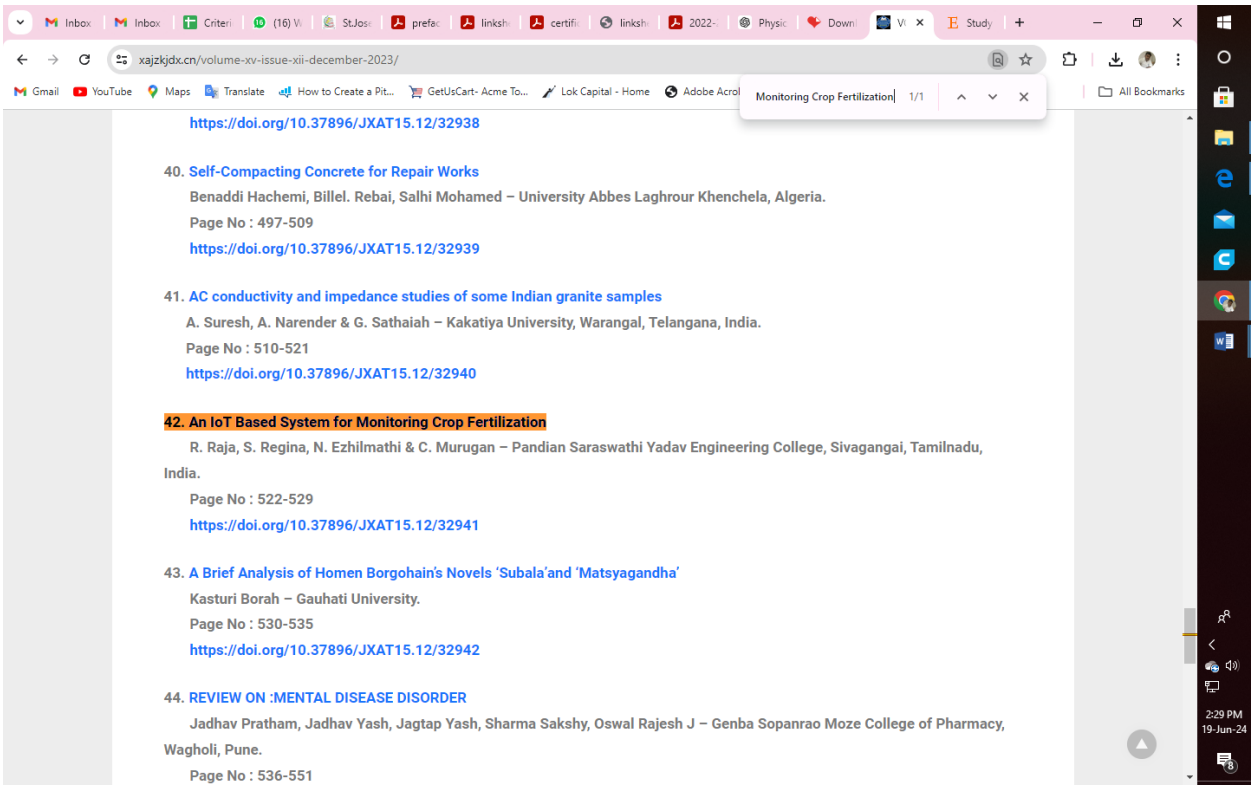

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An IoT Based System for Monitoring Crop Fertilization

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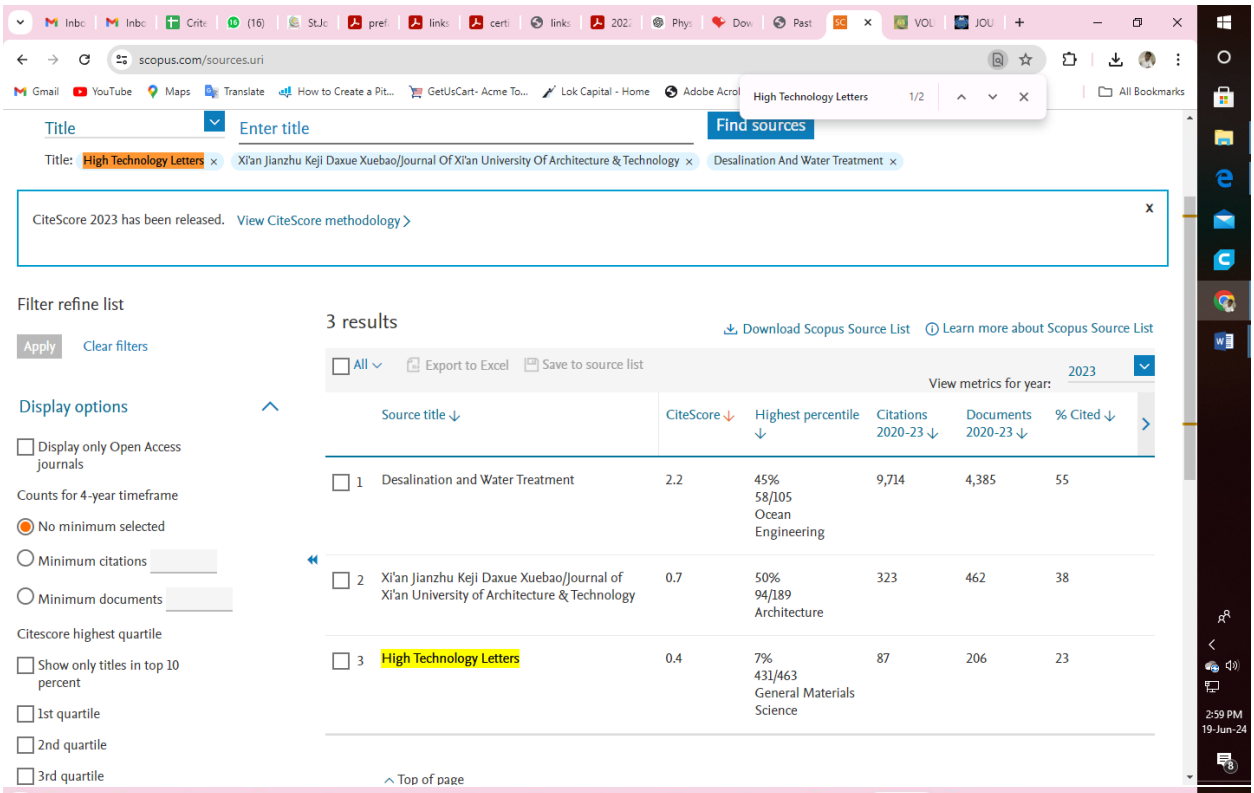
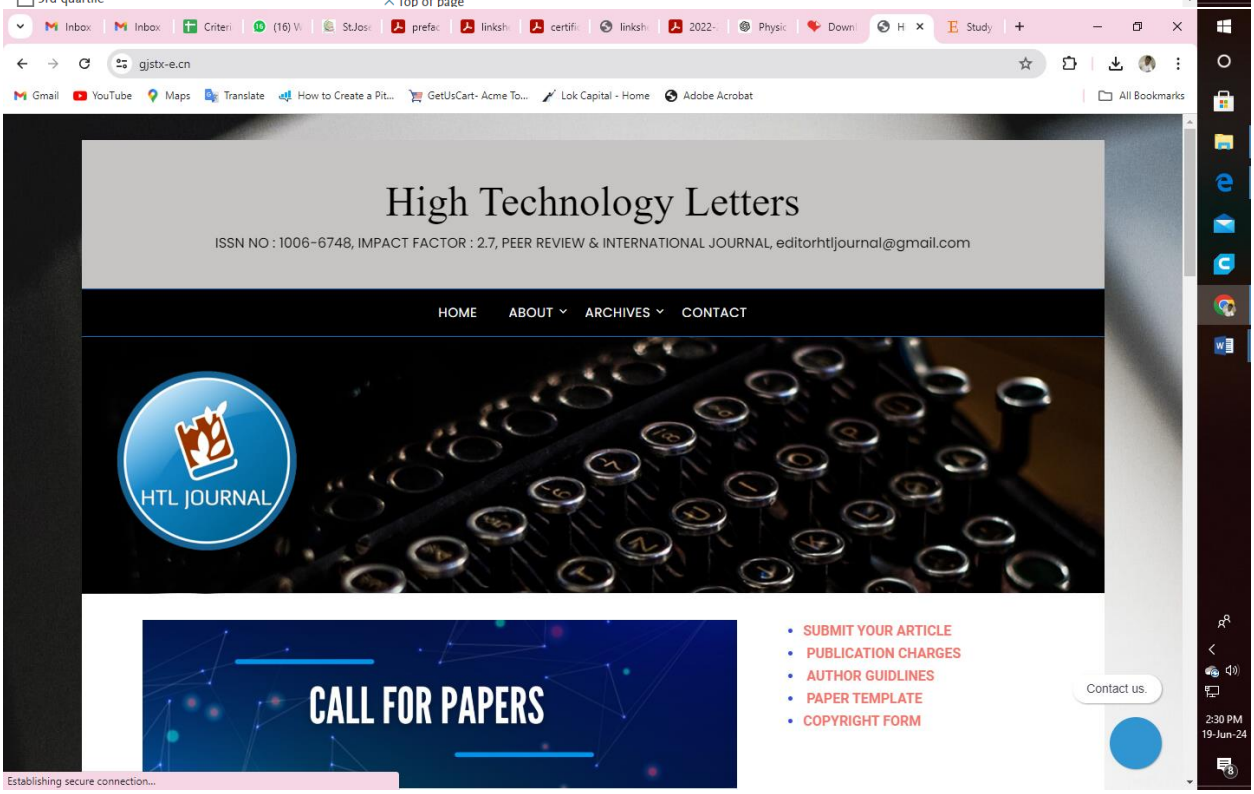
Abstract: In recent days, optimizing crop fertilization represents a pivotal aspect of modern agriculture, ensuring that crops receive the requisite nutrients in precise quantities to achieve maximum yields. A Crop Fertilizing Monitoring System presents a solution by enabling farmers to monitor nutrient levels within their crops and make necessary adjustments to fertilization techniques. This system harnesses IoT (Internet of Things) technology and incorporates key components such as an Arduino microcontroller, an NPK sensor, and an LCD display. The NPK sensor gauges soil levels of nitrogen, phosphorus, and potassium—essential nutrients crucial for robust plant growth. Real-time data on these nutrients gets gathered and transmitted to the Arduino for processing. Subsequently, this processed information gets relayed to the cloud via the IoT network, furnishing farmers with accessible insights for effectively managing their fertilization practices.

Keywords: Crop, IoT, Nutrients, NPK, Arduino, Cloud

1. Introduction

A setup designed to monitor soil moisture, temperature, and pH levels by employing Arduino and various sensors. The collected data is then transmitted to the cloud for analysis and informed decision-making [1]. A fertilizer system [2] employing IoT technology to monitor soil moisture, pH, and temperature levels, while autonomously dispensing the precise amount of fertilizer required. This system utilizes a Raspberry Pi and sensors to gather data for analysis and decision-making. This paper [3] introduces a system designed to monitor soil moisture, temperature, and pH levels, alongside air temperature and humidity, utilizing Arduino and various sensors. The collected data is transmitted to the cloud for comprehensive analysis and visualization. This research [4] focuses on an Internet of Things (IoT) system designed to monitor soil moisture, temperature, and pH levels, along with atmospheric conditions, employing sensors and Raspberry Pi technology. Additionally, the system incorporates a decision support system aimed at assisting in crop management. The design introduces [5] to monitor soil moisture, temperature, and pH levels, alongside





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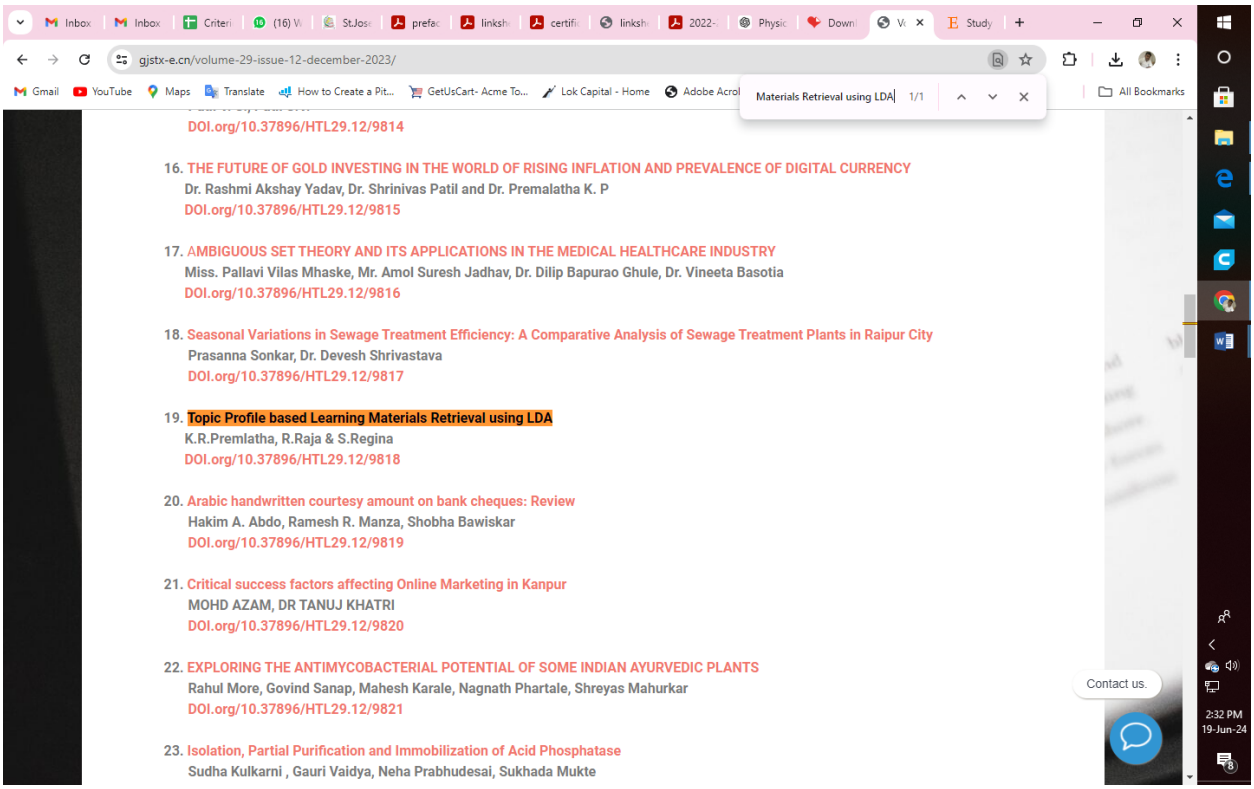

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Topic Profile based Learning Materials Retrieval using LDA

K.R.Premlatha[1], R.Raja[2] & S.Regina[3]
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Pandian Saraswathi Yadav Engineering College, Sivagangai, Tamilnadu, India
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Abstract **- In an E-learning environment, the discovery of suitable learning content, catering to a specific topic is becoming increasingly hard. Normally, hyperlinks presented in the web pages are crawled in a breadth first manner continuously. However, educational contents obtained through crawling need to focus on the content suitable for e-learning. This work presents the automatic generation of search engine queries to obtain seed URLs for a topic focused crawler. Using topic profile terms and levels to improve the searching process, queries are generated for specific topics. Furthermore, the topic focused crawler is used to avoid crawling of all hyperlinks which are not relevant to a specific topic. It crawls only the web pages which are suitable for our e-learning content management system based on the topic profile. In this work, we introduce a new idea of a 'Topic Profile' (profile of the subject in contents of chapters, topics, and annotation terms represented as a spanning tree) which is specially designed for the Content Retrieval System. In addition, we propose a Latent Dirichlet Allocation (LDA) based re-ranking scheme for prioritizing the search results to improve the topic exposure and reduce the redundancy in the retrieved contents.**

Keywords- Information Retrieval, Query Generation, Focused Crawling, Re-ranking, Latent Dirichlet Allocation, Topic Profiling, E-learning

I. INTRODUCTION

The growth of the World Wide Web (WWW) in the last decades has given enormous openings to the teachers and learners, in terms of accessing the educational resources. The amount of online educational contents available is rapidly increasing, which leads to issues such as increased complexity in the organization of educational materials. Keyword based search engines are commonly used for content retrieval now a days, but there are some problems associated with their precision and recall while retrieving the documents [1].

Open Corpus Sources existing on the web, is a resource that is yet to be completely exploited in the area of E-learning [2]. Providing the learning materials for all types of learners usually depends on the quality of learning materials available. Steichen et al discussed the problem associated with the learning materials that are generally obtained from a set of closed corpus documents. The main problem of this type of documents needs manually edited learning objects with huge volume of Meta data [3].

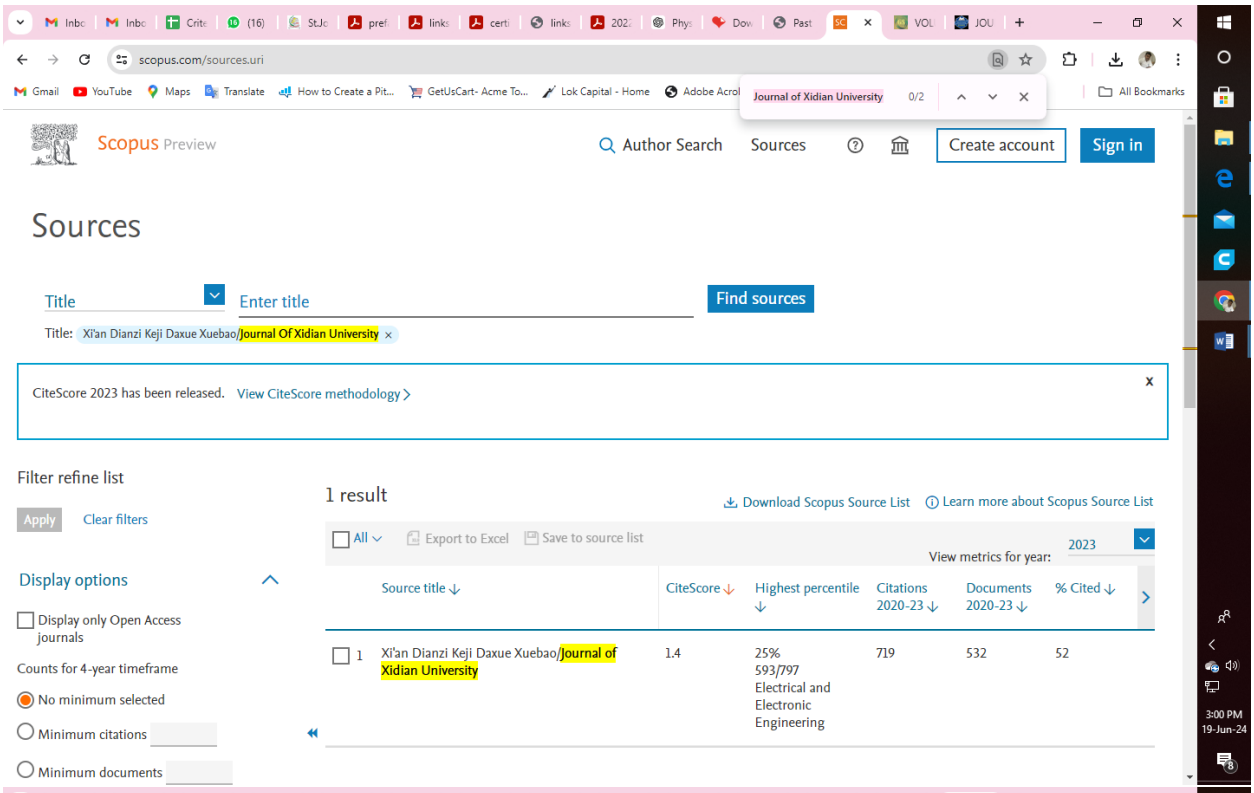
The main aim of the e-learning content management system is wide access to learning materials with greater quality and lesser cost. In order to improve access methods to educational materials, different standards were created like LOM and Dublin Core. In e-learning content development search and discovery of suitable learning materials is the major challenge. SCORM presents several methods for learning content development. However, an effective searching method still remains as a major issue [4]. Lawless et al describes an OCCS (Open Corpus Sources) for e-learning systems, but it requires manual work on the part of the educator [5]. Thus, content discovery from web and content authoring for E-learning is a challenging task in the field of educational data mining. Hence, we present a topic profile-based retrieval system for retrieving relevant content. The aim of this work is to enable automatic discovery and categorization of appropriate educational materials from the web for an E-learning system.

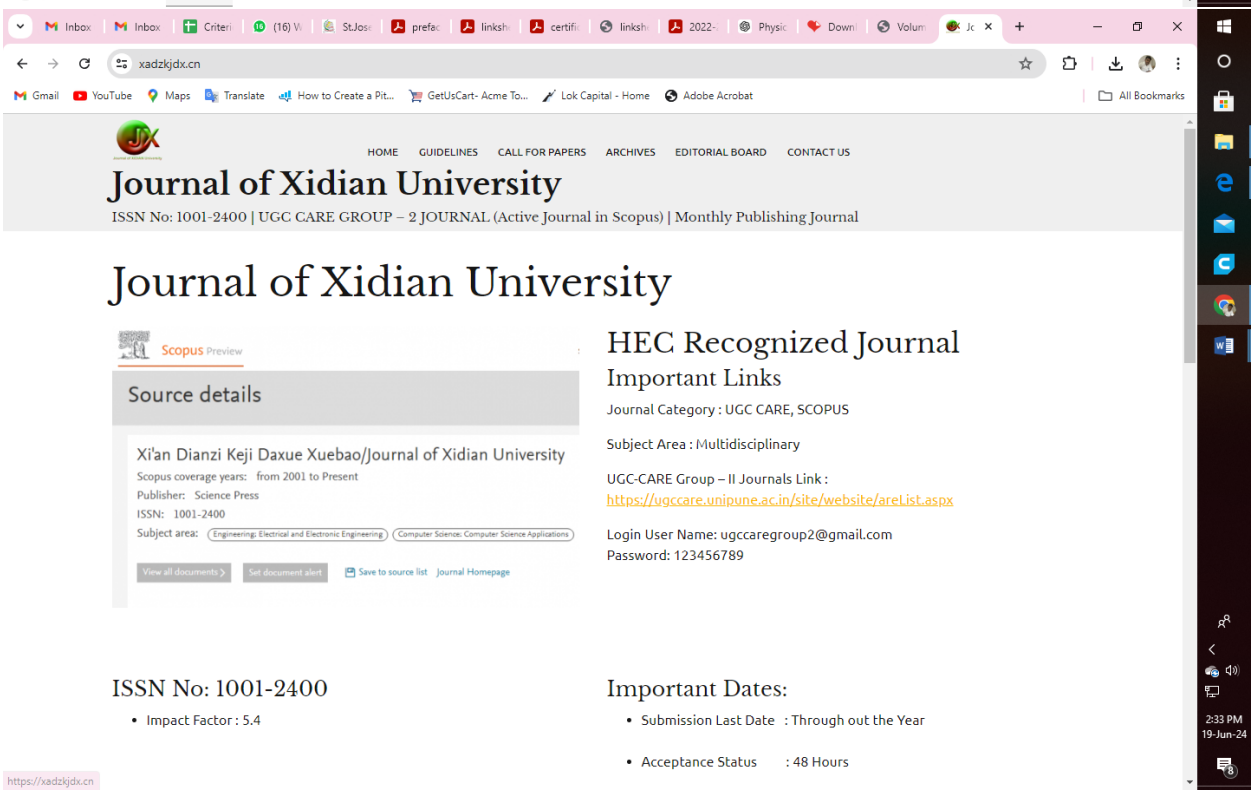
The rest of this paper is structured as follows. Section 2 discusses the previous related work and challenges of content retrieval for e-learning. Section 3 presents a description of the proposed work, its contributions, the algorithms, and techniques to be used, and the architecture of the work. The paper then discusses the proposed re-ranking system for ordering the results based on the topic profile based LDA from the web. Section 4 describes the evaluation of the proposed methods. Section 5 discusses the conclusion and future work to be done in this research area.

II. RELATED WORK

The existing research work in e-learning content retrieval uses mostly the Open Corpus Content for retrieving learning materials. Steichen et al discussed the problem of reusing the open corpus content. Here, the system requires a content authoring part. It takes more time for part of the person to annotate the learning materials. However, there is no guarantee that manual content tagging is accurate and objective [3].

Brusilovsky et al [6] discuss the main problems using Open corpus, which is mostly not prepared for the learning need of the individuals. To recognize/organize such learning content for the learner's need is also





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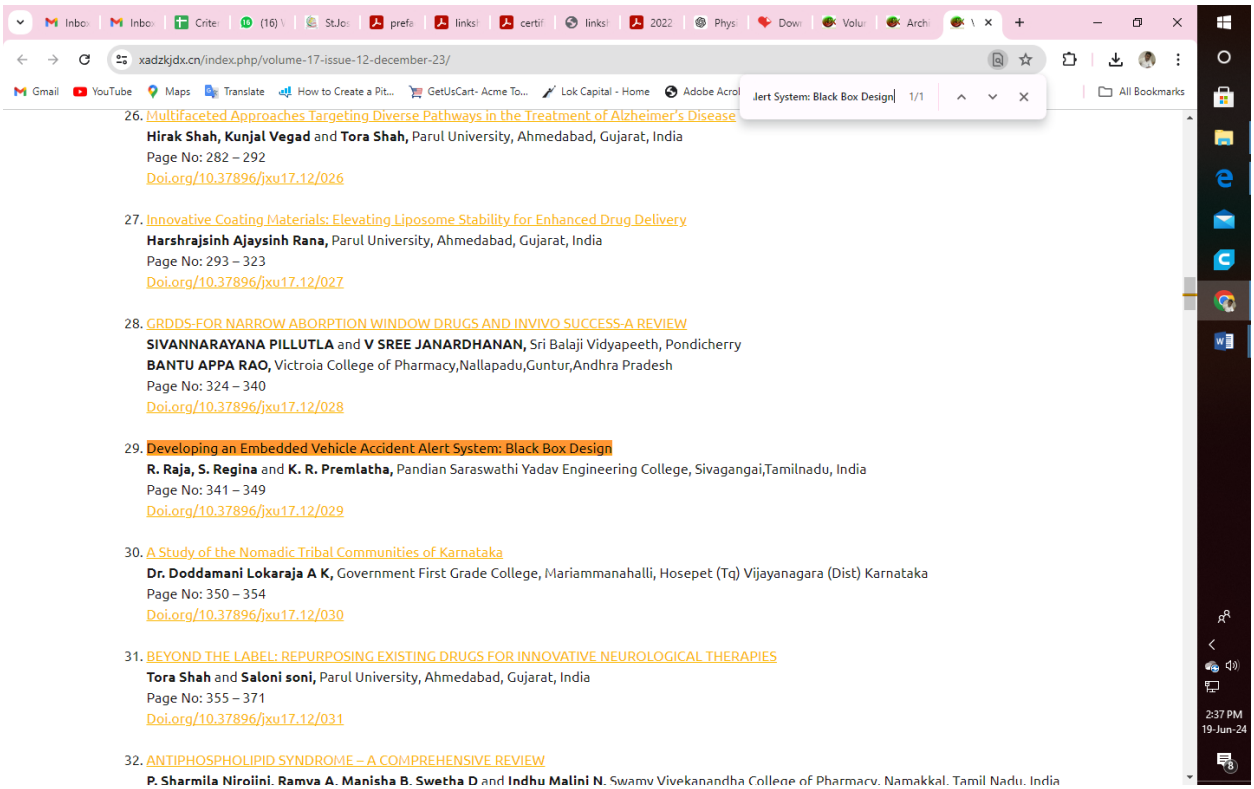

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29. Developing an Embedded Vehicle Accident Alert System: Black Box Design
R. Raja, S. Regina and **K. R. Premlatha,** Pandian Saraswathi Yadav Engineering College, Sivagangai,Tamilnadu, India
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32. ANTIPHOSPHOLIPID SYNDROME – A COMPREHENSIVE REVIEW
P. Sharmila Nirojini, Ramya A, Manisha B, Swetha D and **Indhu Malini N,** Swamy Vivekanandha College of Pharmacy, Namakkal, Tamil Nadu, India

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Developing an Embedded Vehicle Accident Alert System: Black Box Design

R. Raja[1], S. Regina[2] & K. R. Premlatha[3]
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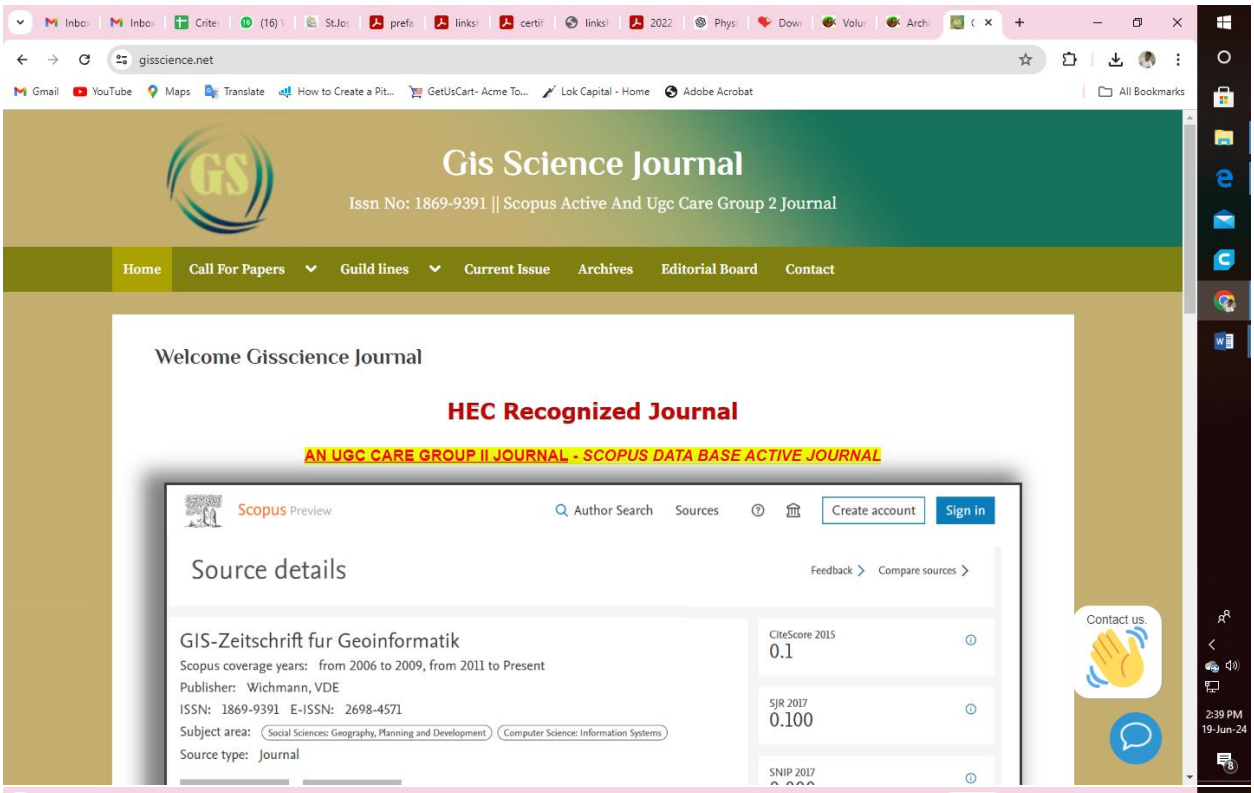
[1&2]Department of Electronics and Communication Engineering
[3]Department of Computer Science and Engineering
Pandian Saraswathi Yadav Engineering College, Sivagangai,
Tamilnadu, India.

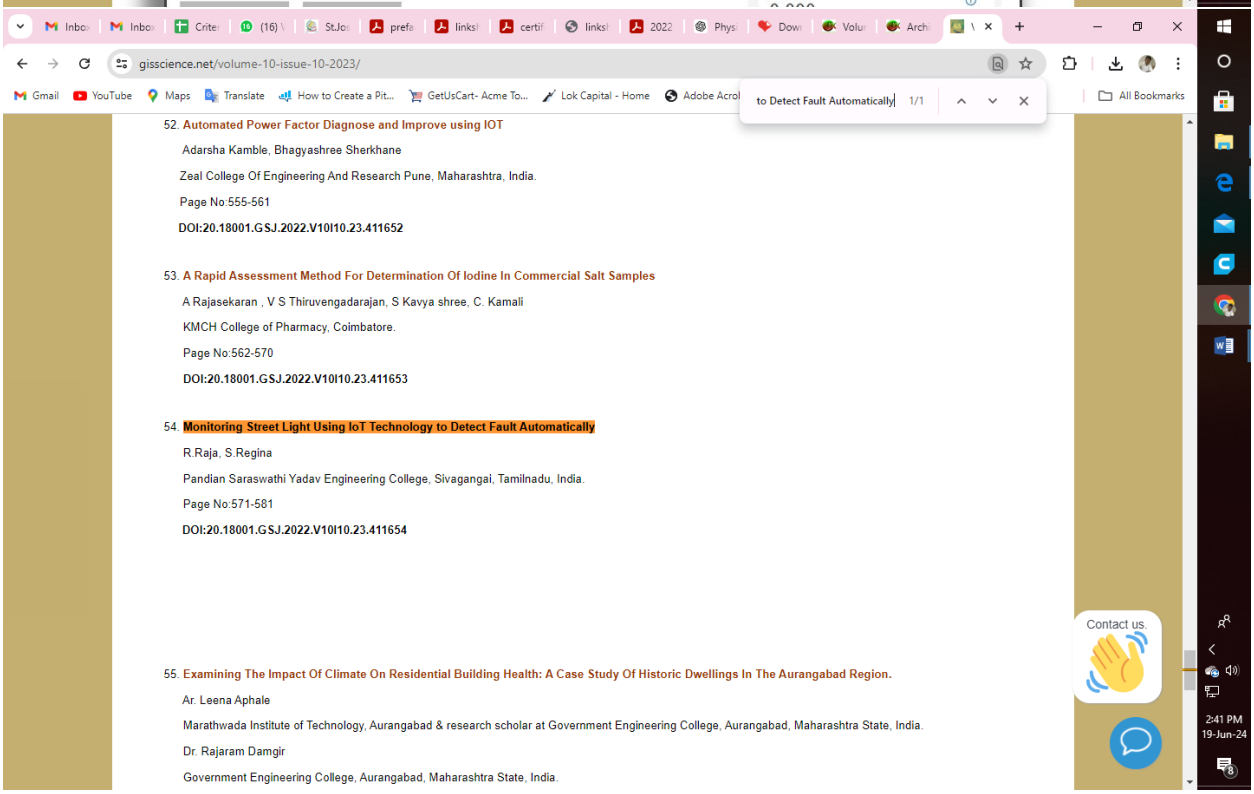
Abstract: In recent days, many vehicles encounter critical situations leading to accidents, resulting in tragic loss of lives. Often, despite the possibility of saving individuals involved, the lack of timely information regarding the incident's occurrence, location, and severity becomes a significant hindrance. This research aims to address this limitation by offering an optimal solution. The research proposed utilizes a accelerometer sensor within vehicles for a car alarm application. This sensor plays a crucial role in detecting dangerous driving patterns. By employing this technology, the picture is captured and recorded the vehicle's movements before and after a crash. The accelerometer sensor enables the identification of an accident as it occurs. In the event of an accident, crucial information, such as the vehicle number and contact details of the individuals involved, will be automatically transmitted to the police control room or a designated rescue team using Internet of Things (IoT) technology. This immediate transmission allows law enforcement to swiftly identify the source of the distress signal. Subsequently, upon confirmation of the accident's location, prompt and necessary action can be taken. This research serves as an effective solution to mitigate such critical situations by leveraging technology to ensure swift communication of vital information, enabling rapid response and potentially saving lives.

Keywords: **Accelerometer sensor, Vehicle, Accident, IoT, Vehicle number, Contact details**

1. Introduction

An automatic alarm device designed for traffic accidents is capable to autonomously detect a traffic accident occurrence, swiftly identify the location, and promptly transmit essential information to a first aid center within a mere two seconds. This transmitted data includes geographical coordinates, precise time details, and contextual circumstances surrounding the traffic accident. Utilizing a satellite navigation system [1], this device enables first aid rescuers to accurately pinpoint the accident location with a maximum error margin controlled within 10 meters. This precision ensures that the rescuers can swiftly reach and attend to the injured individuals, thereby facilitating prompt assistance and potentially saving





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Monitoring Street Light Using IoT Technology to Detect Fault Automatically

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Department of Electronics and Communication Engineering
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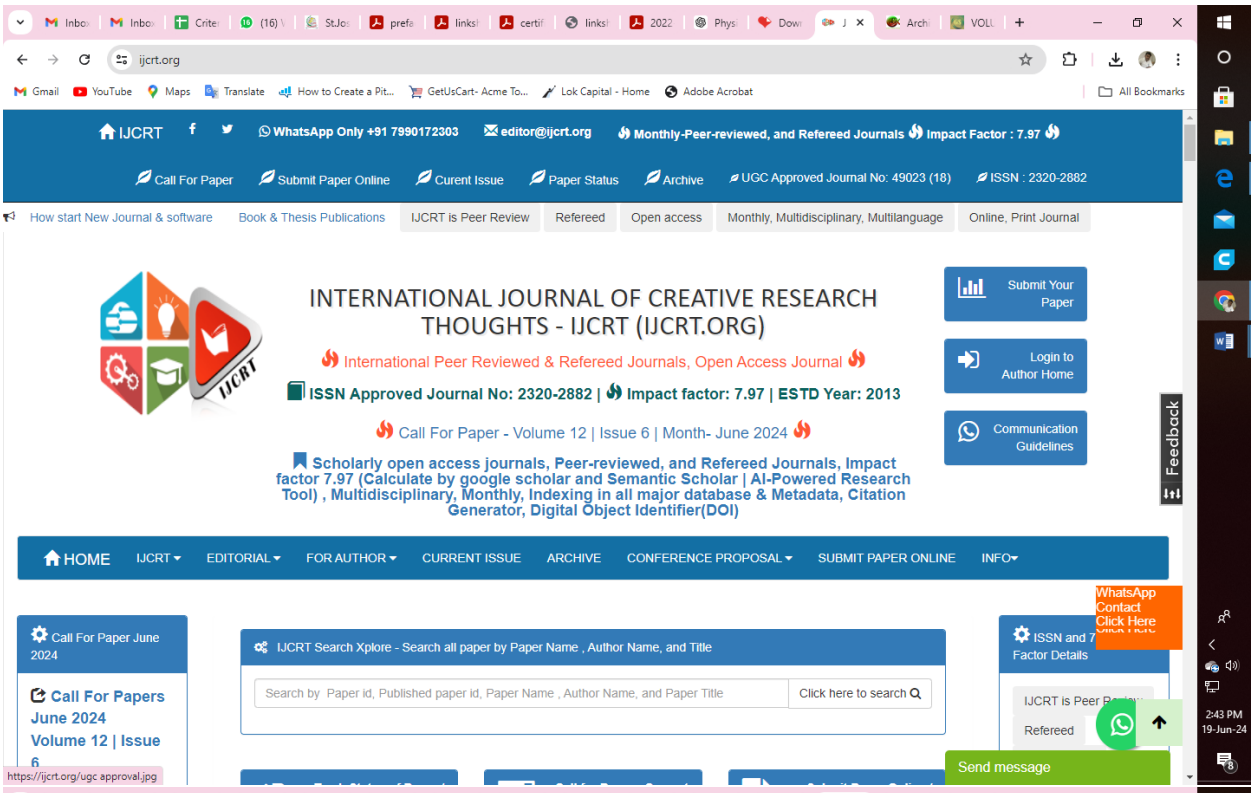
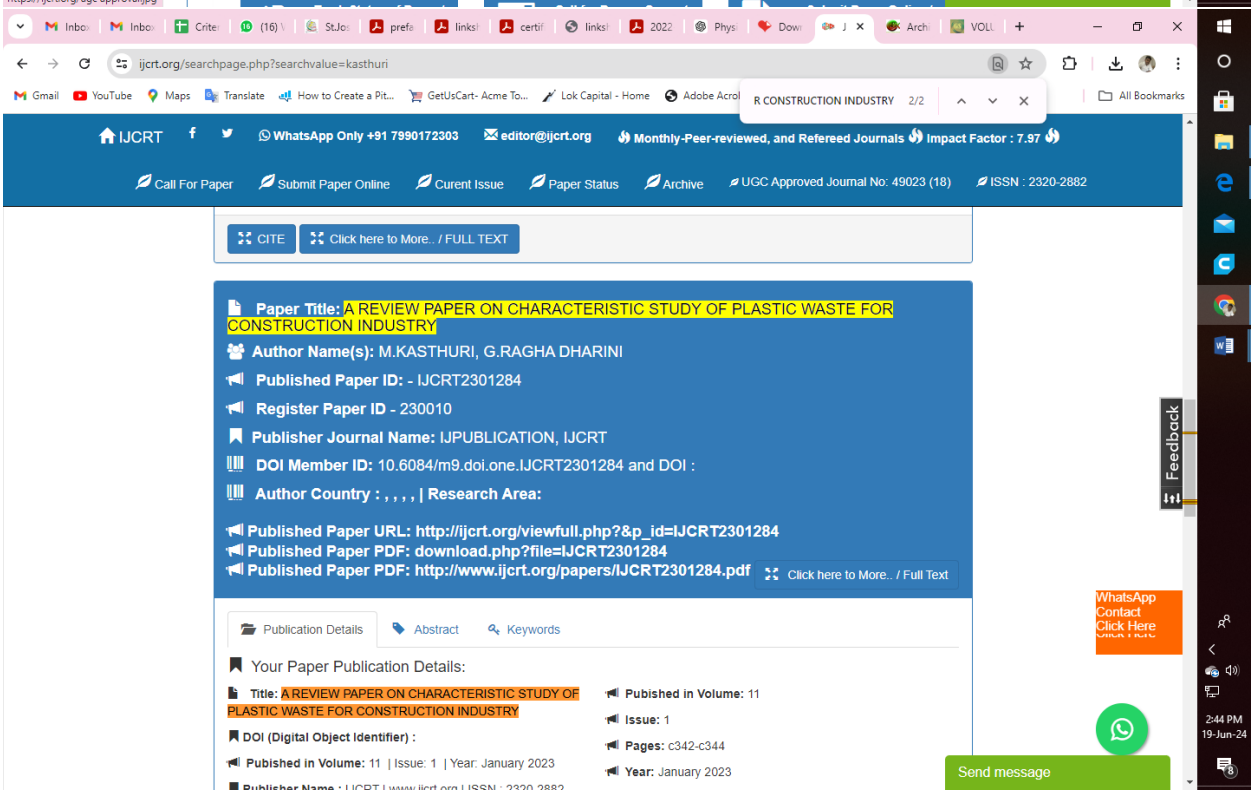
Abstract: India facing one of the major problems is maintenance of street lights. In India Street lights are maintained manually, it is found that there is wastage of power by operating the street lights due to manual operations like switch on the lights at day time. Due to that wastage of electricity will be occurred. The methods that are working on the maintenance of street lights are not effective. We all may notice that the street light illuminates continuously. Also light is glowing in some unnecessary areas for about 12 hours. It glows very brightly in the area during absence of person or vehicle. And the main thing we noticed was there will belots of defective bulbs in the street light and it take some time to repair that problem. And also it is difficult to find which street light is in defective state. And man power is required to identify that problem. By that man power also lots of confusion in identifying the defective bulbs. Our idea will give solution for all the above mentioned problems. The Objective of the project is to provide the Smart Street Light Monitoring using IoT. Monitoring means it focus on automatic control, intensity variation and fault detection. a smart and energy-efficient street lighting system that not only reduces energy consumption and operating costs but also provides immediate information about any faults in the street lamps. Such systems are becoming increasingly popular as cities look for ways to improve energy efficiency and overall infrastructure management.

Keywords: Street light, Electricity, IoT, Smart, Fault detection, Efficiency, Automatic Control

1. Introduction

Street light automation is used to control street light automatically using GSM module (global system for mobile communication).It is constructed to perform and increase the efficiency of street light during in nights. It is implemented by 89C51 microcontroller which on setting of time delays switches ON/OFF the street lights and sends the updated messages through a phone [1]. Smart lighting gives remote lighting control by adjusting the amount of time the lights are turned-on. Inorder to reduce energy costs without sacrificing public safety. It will also be named as adaptive street lighting which dims when not needed or any movement is detected [2]. Nowadays, a manual system is considered to switch ON in the evening before the sunsets and switch OFF in the next day morning after sunrise. From this, the power will be





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A Review Paper On Characteristic Study Of Plastic Waste For Construction Industry

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Abstract: **The policy and practise around plastic garbage generated in homes, institutions, and industry in its cities are rapidly changing. The degradation of soil and land by plastic accessories is growing daily. Plastic moulding of a pliable material is possible with or without fracture. It is therefore inexpensive, non-sharp, and water-resistant. Plastics are widely employed on various scales. Because it is the largest industry across all economic sectors and the biggest user of raw materials, the construction industry is used in a variety of ways. Different methods of recycling waste are less frequently used in the building business as plastic waste has been proven to be efficient. In the process of building roads, plastic waste-coated aggregate is combined.**

Key Words: Plastic waste, Waste management, Use of plastic construction.

I. INTRODUCTION

Plastics are a class of semi-synthetic organic molecules that are typically made from fossil fuels, while unique bioplastics can also be made from biomass that is grown sustainably. Plastics may be moulded into any shape and have a remarkable resistance to corrosion thanks to their simple malleability. Their opacity, thickness, elasticity, and thermal properties can be altered with the right additions. It is hardly surprising that plastic has become a necessary component of human society. Plastics are materials with good thermal and electrical insulating qualities that are inexpensive, lightweight, robust, durable, and corrosion-resistant. (Andrade *et al.*, 2016) The variety of polymers and the flexibility of their characteristics are exploited to create a wide range of goods that enhance technology and medicine, save energy, and benefit society in a variety of other ways. (Thompson *et al.*, 2009). As a result, over the past 60 years, the output of plastics has significantly expanded, going from about 0.5 million tonnes in 1950 with over 260 million tonnes at this time.(Saxena and Singh, 2013).Thermoplastics and thermoset plastics are the two primary groups into which commonly used polymers fall. Heat causes thermoplastics to soften while thermoset plastics harden, keeping the original shape. For instance, thermoplastics are used to make soft drink bottles and PVC pipes while thermoset plastics are used to make electric kettles, plugs, etc.

II. SOURCE OF PLASTIC WASTE

The Madurai Corporation has said that it has increased the efficiency of its garbage collection in the past one year, which has led to the daily collection of garbage 550 tones to 810 tones. The waste floating on water bodies and thrown around the dumper bins continues to be a common sight. It also said that wet waste collection done with the help of members of SHGS has also improved, as the daily collection.

However, Unsegregated plastic still piles up on road sides and water bodies, including the river. The main sources of plastic debris found in the ocean are land-based, coming from urban and storm water runoff, sewer overflows, littering, inadequate waste disposal and management, industrial activities, tire abrasion, construction and illegal dumping.

III. PROPERTIES OF PLASTIC

Plastic is one of the most disposable materials in the modern world due to its many excellent qualities, including its adaptability, low weight, hardness, resistance to chemicals, water, and impact, and resistance to all of these. In both urban and rural locations, it makes up a sizable portion of streetside litter. Landfills are quickly becoming choked-off water bodies as a result (Jalaluddin, 2017). The use of thermoplastic and thermoset polymers, which come in two main varieties, depends on the application. One may be repeatedly reused whereas the other cannot, which is the primary physical distinction between the two. Since there is no chemical bonding when thermoplastics are heated, the material's physical characteristics are unaltered. Thermoplastics can thus be repeatedly moulded, melted, and reshaped into a variety of shapes, sizes, and objects.Thermoset plastics are polymers that are similar to thermoplastics but often stronger due to the molecular cross-linking of the polymer. They get their name because, when mixed and moulded, the polymers undergo a chemical shift during processing that results in the formation of an irreversible chemical link. The plastic is "set" once it has been moulded and consolidated, which is a process known as curing.

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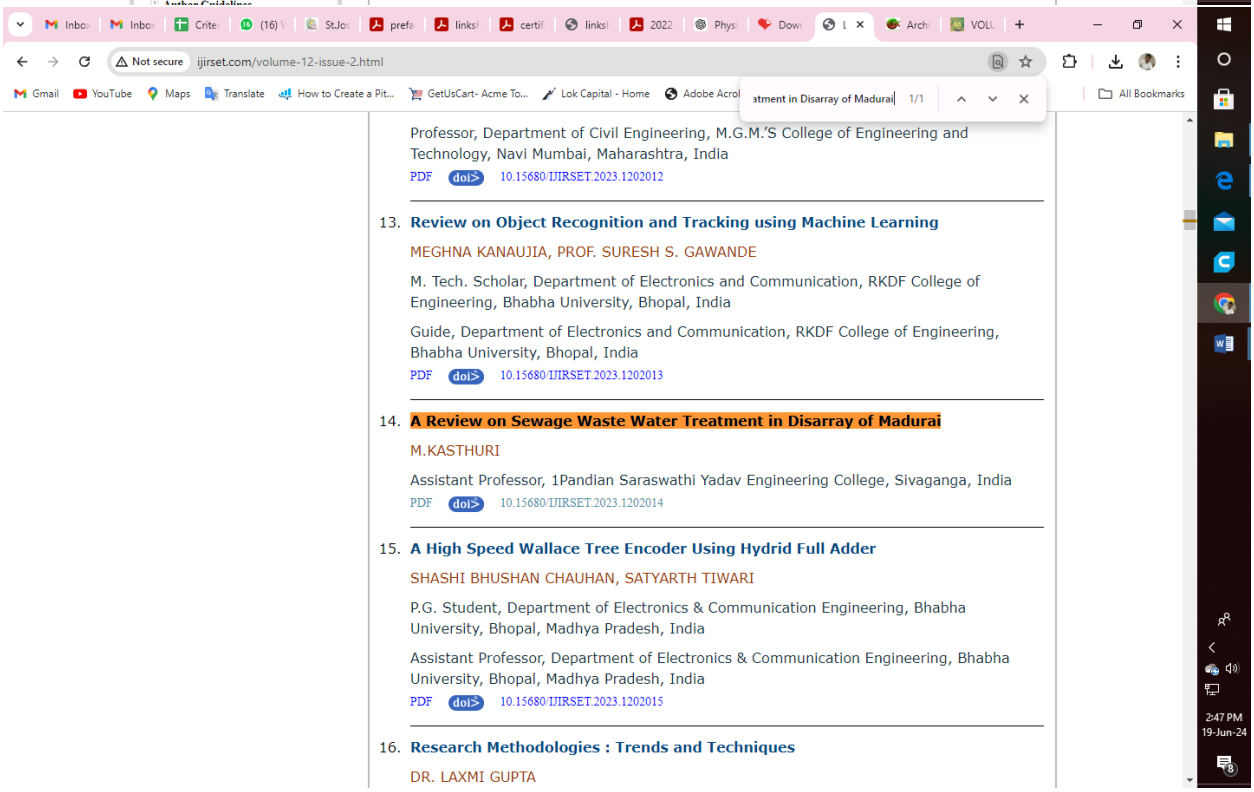

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A Review on Sewage Waste Water Treatment in Disarray of Madurai

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ABSTRACT: Waste water treatment is a process used to remove contaminants from waste water or sewage and convert it to an effluent that can be returned to the water cycle with acceptable impact on the environment, or reused for various purposes. The treatment process takes place in a waste water treatment plant (WWTP) also referred to as a Water Resource Recovery Facility (WRRF) or a sewage treatment plant (STP) in the case of domestic waste water. Pollutants in waste water are removed. Converted or broken down during the treatment process.

KEYWORDS: Sewage treatment plant, Ground water, Nanotechnology in waste water Management

I. INTRODUCTION

The sewage treatment plants constructed by the Madurai Corporation in 2011 in vellakal and sakkimangalam areas have not achieved their full capacity officials in the civic body here admitted.

At present, only one fourth of the total sewage water generated in the city is treated at these plants. The rest is released in to water bodies like channels tanks and the Vaigai River, posing health and environmental hazards. The capacity of the vellakal sewage water treatment plant is 125 million litres per day (MLD) where as he capacity of the sakkimangalam plant is 45.7 MLD. These plants were constructed considering the need for the next 30 years, through; the plants started functioning two – and – a half year's back, all the sewage water generated in the city can't be transferred to the treatment plants. The pipes carrying sewage water from various pumping stations to the treatment plants proportionate to the requirement have not been modified yet, said source from the engineering department of Madurai Corporation.

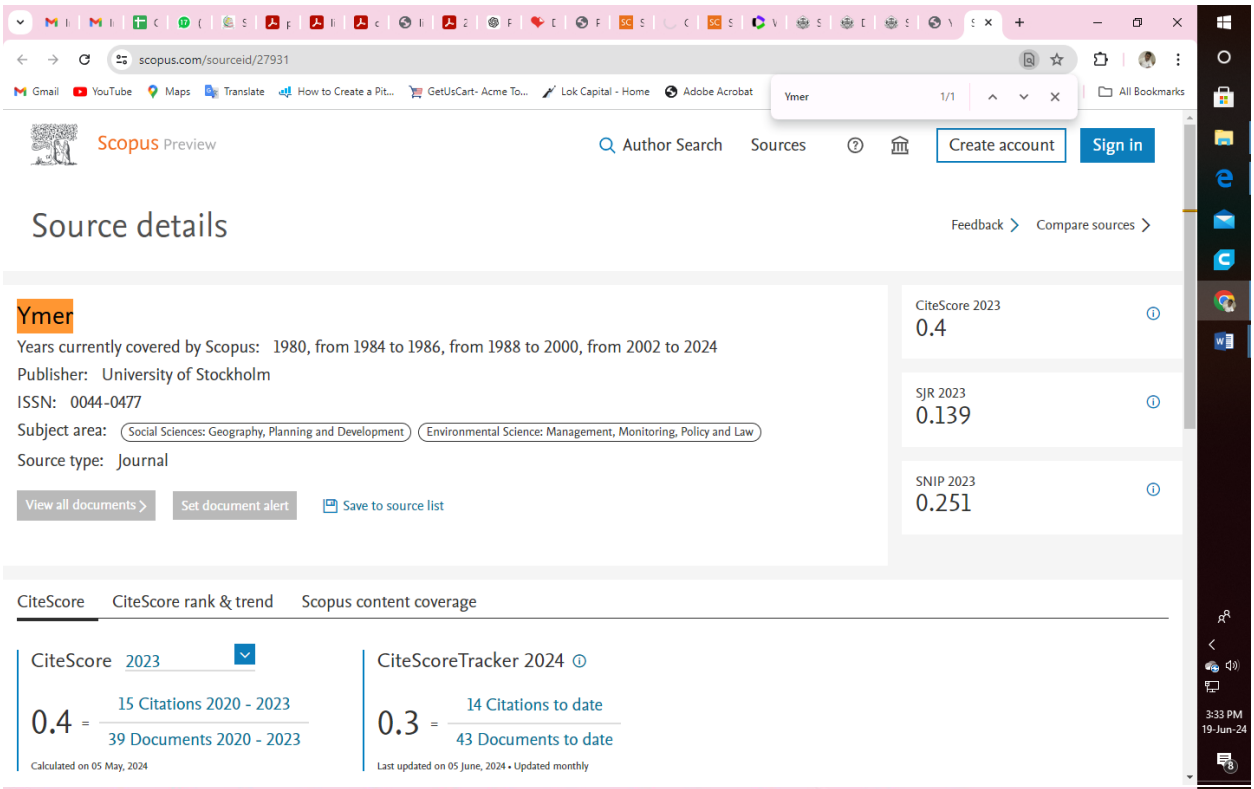
II. OBJECTIVE OF THE STUDY

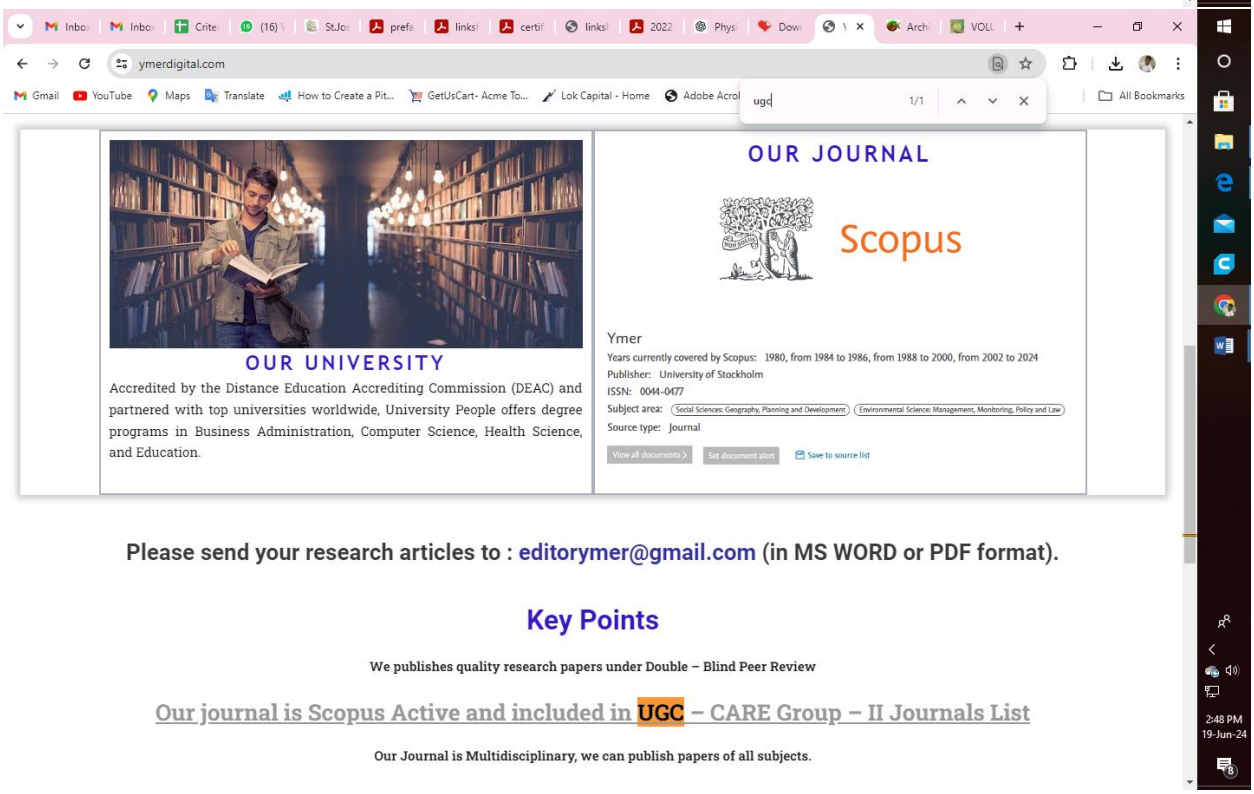
The objective of municipal and industrial waste water treatment is to extract pollutants, remove toxicants, Neutralize coarse particles kill pathogens so that quality of discharged water is improved to reach the permissible level of water to be discharged in to water bodies or for agricultural land. The total sewage water generated from the city, excluding the newly – added areas, is more than MLD. However only 20 MLD is treated at both the plants. The treated water is released to the nearby agricultural lands instead of diverting it in to water short city. Around 60 MLD of untreated sewage water from the pumping stations is frequently let in to Vaigai River, near by tanks and channels. Environmentalist warns that the untreated water opened in to the water bodies can affect people in the long term.

III. SEWAGE GENERATION IN MADURAI

Madurai is one of districts of Tamilnadu in India, Madurai District population in 2022 is 3,210,442 (Estimates as per aadhar uidai.gov.in Dec 2020 date). The district has an total area of 3710, 317.45 sqkm is urban and 3392 sqkm is rural. Out of total population of Madurai 3,372,460 in the distric, 1,846,801 are in urban area and 1,191,451 are in rural area.479851 households are in urban,315036 are in rural area 1485340literate people in urban 788,090 in rural area. Due to such drastic growth in urban population of Madurai the quality and strength of sewage has also increased with time.

It was found that currently 125 MLD of sewage is being generated in Madurai. The Madurai Corporation approved the establishment of a sewage treatment plant (STP) with two million litres per day capacity at vaigai river to treat sewage water carried by the Pandhalkudi channel before entering the river course .It was approved during the special council meeting chaired by corporation commission.





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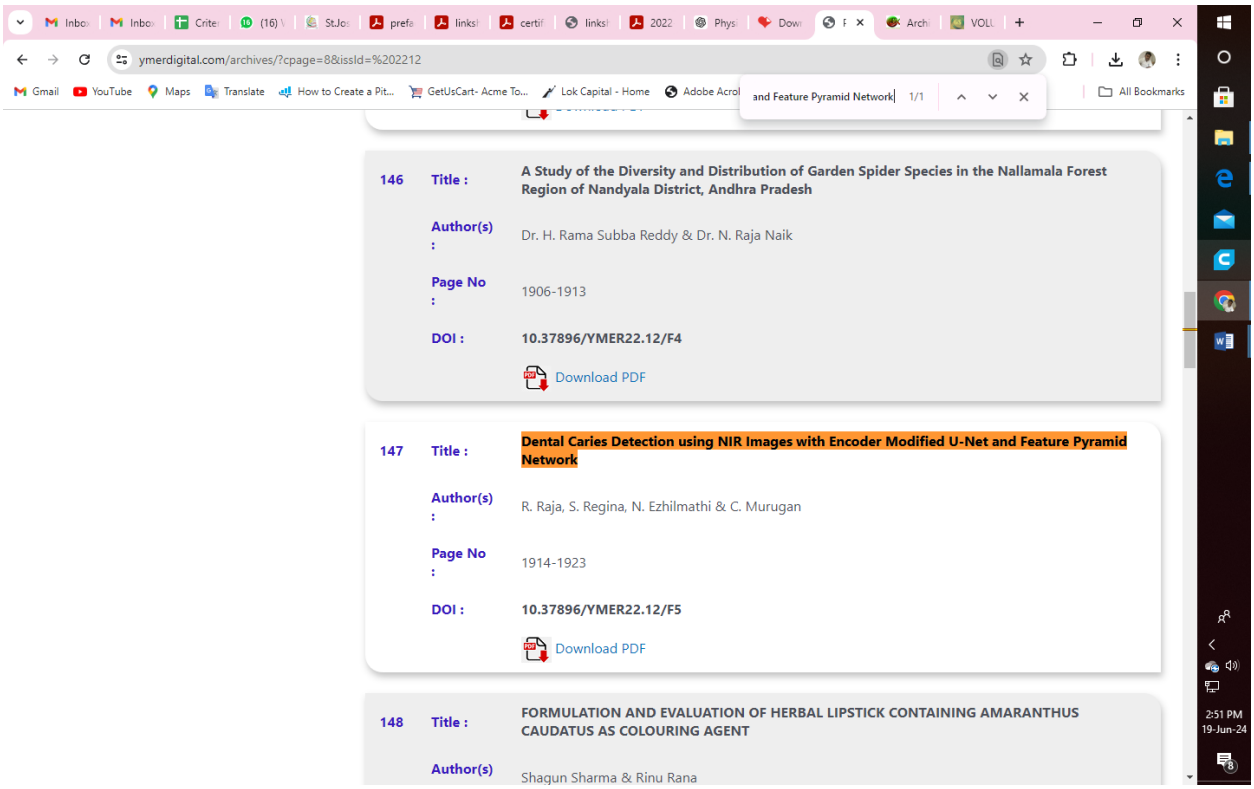

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Dental Caries Detection using NIR Images with Encoder Modified U-Net and Feature Pyramid Network

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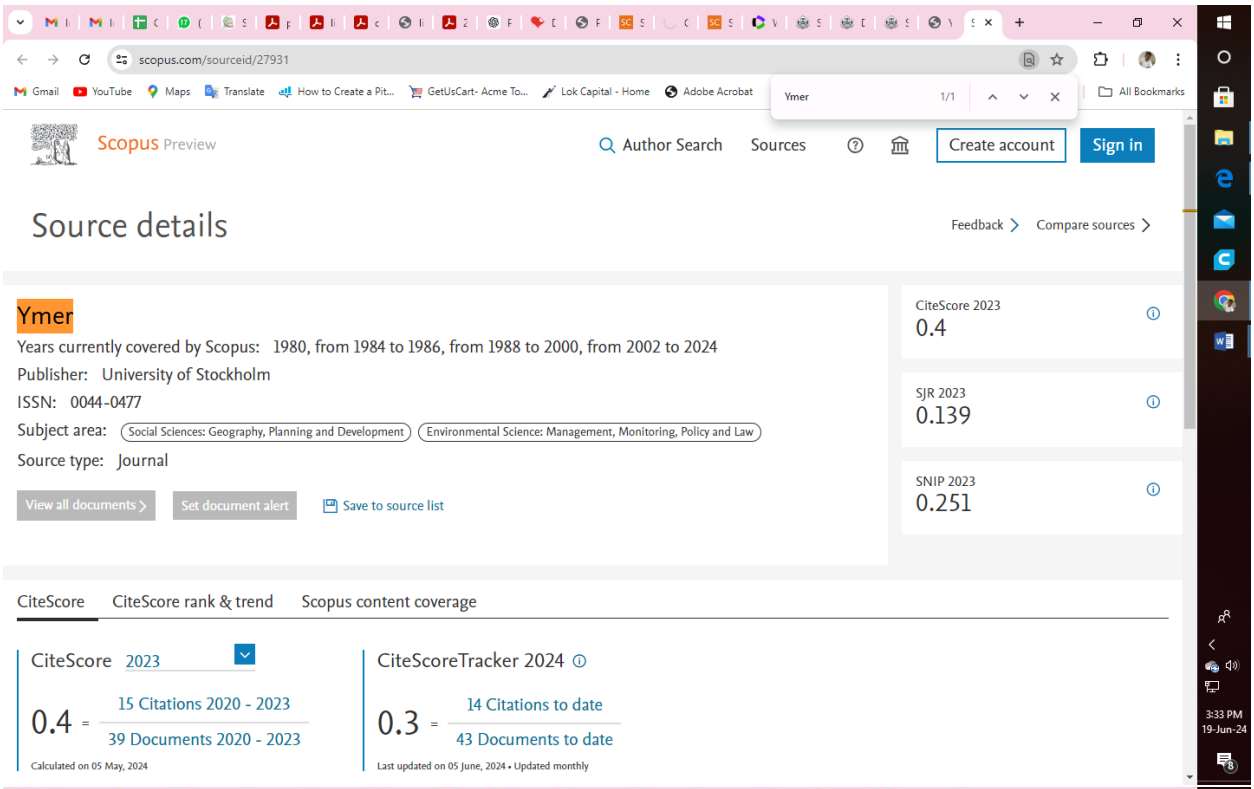
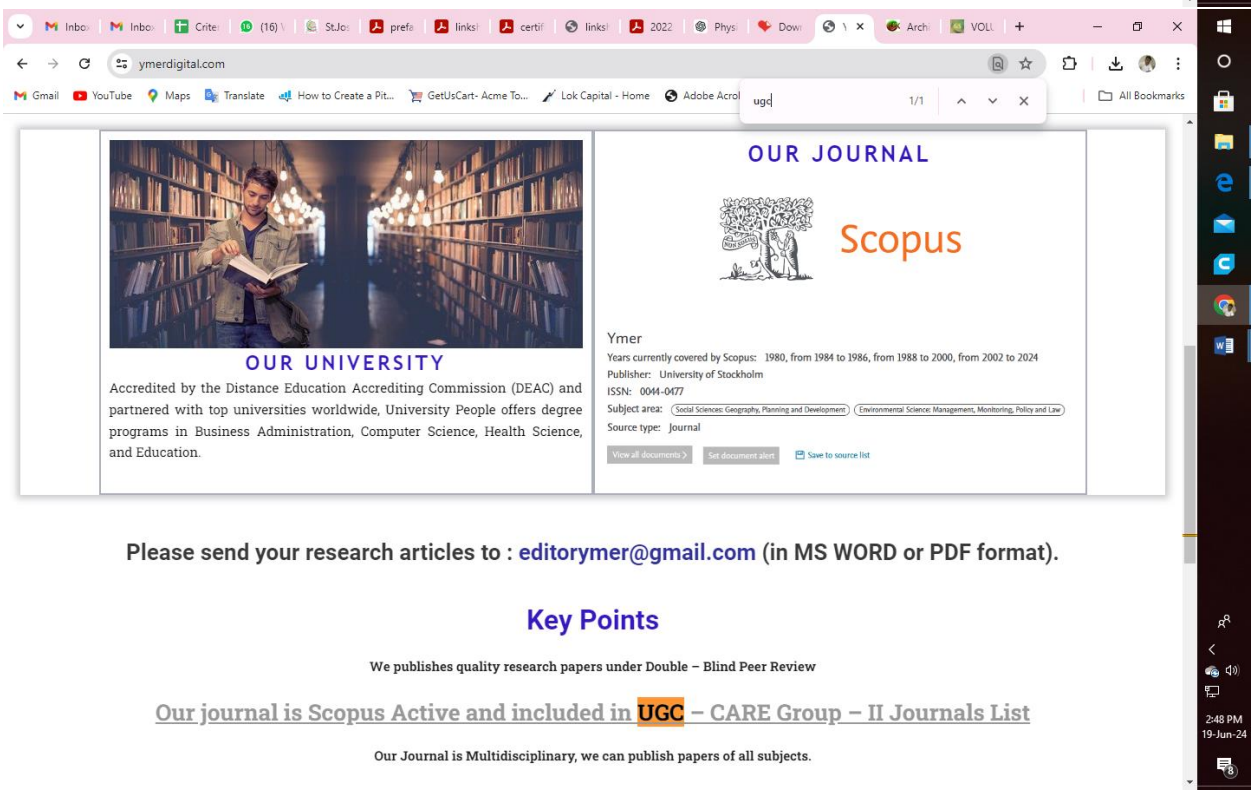
Abstract: Automated dental caries detection has garnered increased attention due to technological advancements in machine learning methods. This stands as a crucial concern in dentistry, particularly in the accurate identification of caries, as they can lead to severe health complications. This study endeavors to precisely segment and identify dental diseases. In this work, a pioneering technique employing the Encoder Modified U-Net in conjunction with the Feature Pyramid Network is proposed for segmentation purposes. The U-Net model is widely recognized and utilized in medical image segmentation due to its encoder-decoder architecture and skip-connection capability, allowing for the capture of multi-scale information in medical images. The initial stage of segmentation produces a preliminary result, which is utilized to extract the Region of Interest (ROI). This ROI is subsequently fed into the second stage of the U-Net model. Maintaining the original resolution as much as possible for the input image in the second stage significantly enhances the segmentation performance. This proposed model has been implemented using MATLAB and rigorously compared against existing algorithms in terms of accuracy, F-score, precision, and recall rates to validate its efficacy and performance.

Keywords: Dental Caries, Encoder, U-Net, Segmentation, MATLAB

1. Introduction

The system's design [1] incorporates intensity-modulated light and relies on detecting early-stage caries by analyzing the altered thermal-wave field. This change is a result of increased light absorption at sites affected by caries. Consequently, this altered thermal field is captured by an IR camera through the emission of infrared radiation. To ensure cost-effectiveness and clinical applicability, a low-cost LWIR (8-14 μm) camera has been seamlessly integrated into the thermophotonic imaging system. The IR camera utilized [2] an uncooled microbolometer LWIR detector. This choice is deliberate, as these detectors are highly suitable for implementation in clinically viable imaging systems. A straightforward approach utilizing laser-induced fluorescence spectrum with enhanced backscattering is proposed for the early detection of initial caries in





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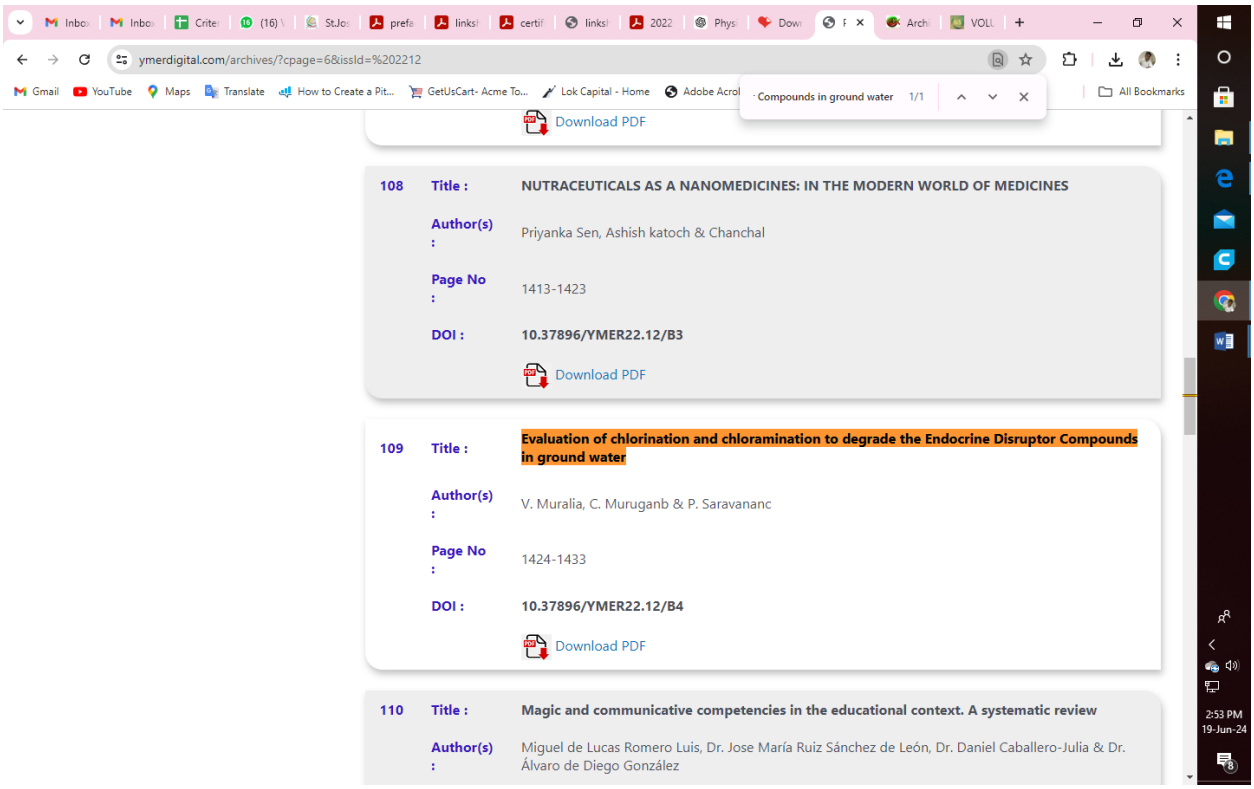

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Evaluation of chlorination and chloramination to degrade the Endocrine Disruptor Compounds in ground water

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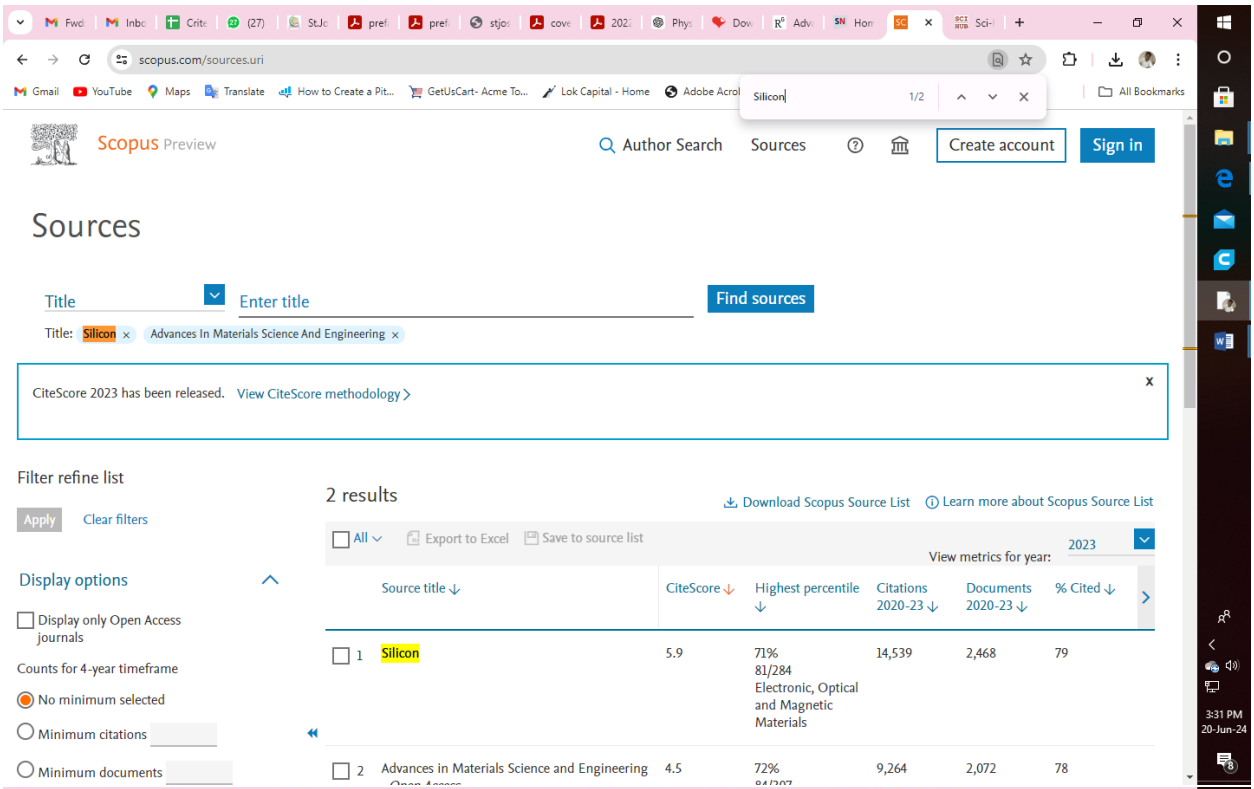
Abstract

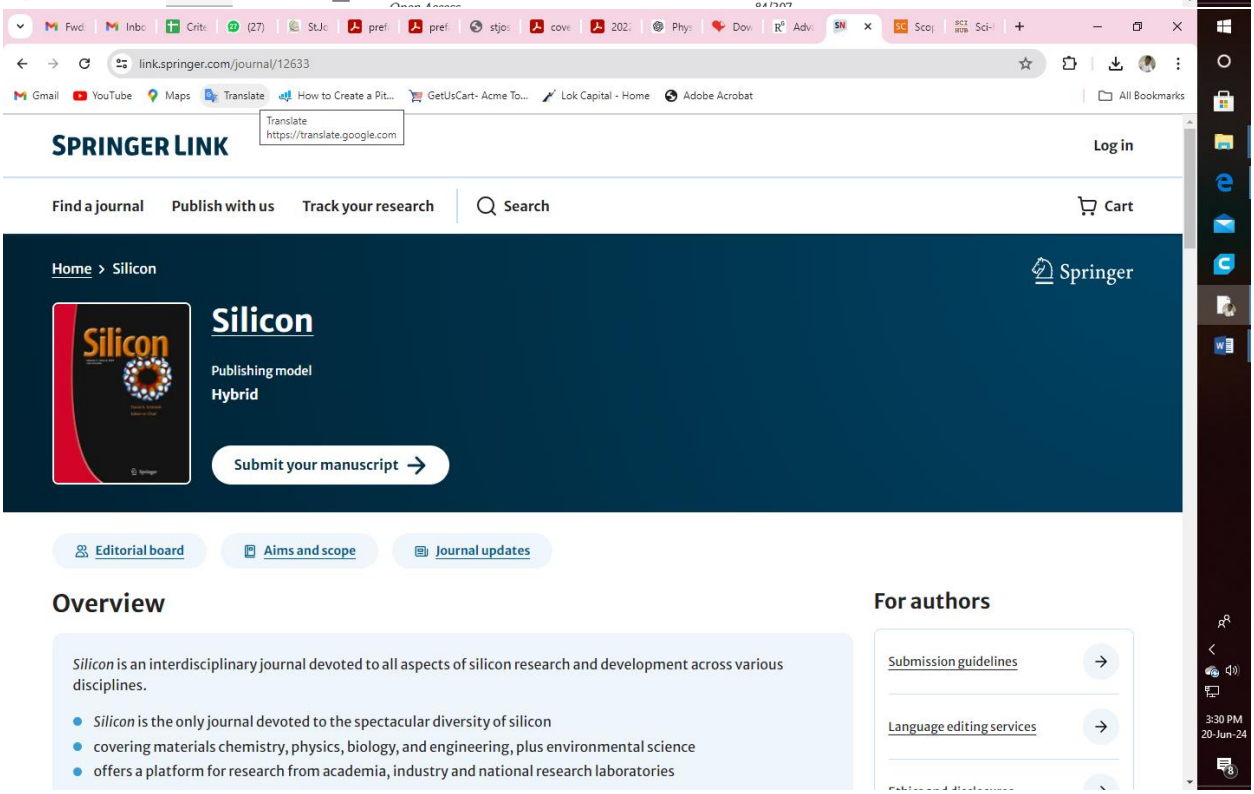
Emerging public health concerns relating to the epigenetic effects of Endocrine Disruptor Compounds (EDCs), along with the reconceptualization of dose response curves, provides a compelling rationale for addressing estrogenically active contaminants in drinking water. These environmental health concerns are now known to have long lasting impacts, especially on fetal development. For this ground water research, the estrogenic EDCs are identified and the treatment processes, Chlorination and Chloramination are done. The quantification of EDCs present in sample/treated sample were done by Liquid Chromatography/Mass Spectrometry in tandem mass spectrometry. The EDC found in the sample was Ethinylestradiol (EE2). By comparing the reduction in EE2 present in the treated sample implied that the effective treatment process is Chlorination. Thus, the conclusion made from this research is that Chlorination is the process that is more capable of reducing EE2 present in the sample that the Chloramination process.

1. Introduction

Endocrine disruptors are introduced to the environment through many venues. Once these contaminants are in the environment, they are difficult to detect and often impossible to avoid. Since endocrine disruptors are active at very low levels, the amounts found in the environment are often deemed harmless yet have potential implications to the functioning of the body's endocrine system [1].

The endocrine system is very complex and has many pathways that can be disrupted internally (endogenously) and externally (exogenously). Complex systems are characterized by such interactions that lead to the emergence of new relationships at different levels of chemical organization [2].





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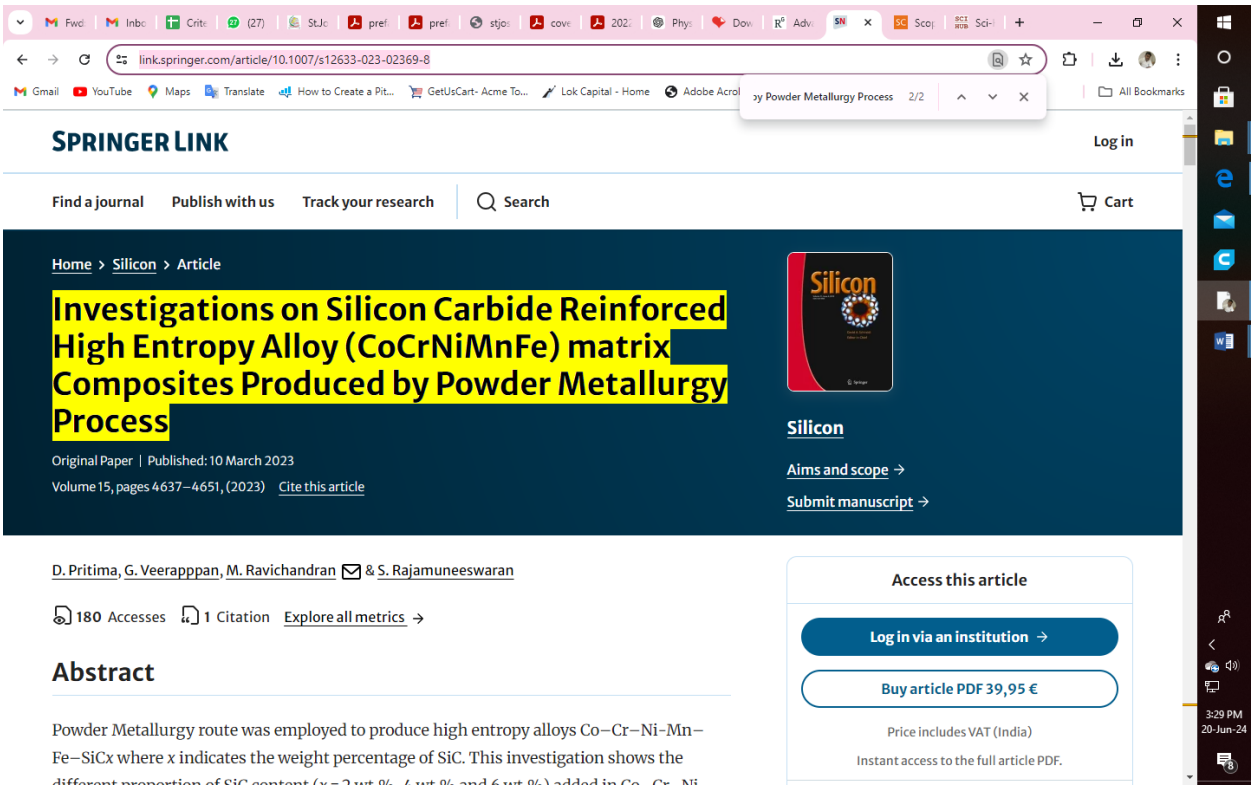

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