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Proceeding of the below Conference Papers

03rd International Conference on Applied Science

05th International Conference on Multidisciplinary

03rd International Conference on Music, Drama, Visual & Performing Arts

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PREFACE

Global Academic Research Institute is proud to present GARI SUMMER MULTIDISCIPLINARY SYMPOSIUM 2022 which is a series of successful research symposium. The Inaugural Session and the Technical Sessions were conducted in Galle Face Hotel, Colombo, Sri Lanka. The conference was organized into different disciplines which empirical, conceptual and methodological papers were received from academics, practitioners and public policy makers were accepted paying austere attention to the academic standards of the papers. To maintain consistency, authors were prescribed to follow the academic writing format of the GARI Publishers. The reviewing process was apparently transparent where papers underwent a double blinded review process by eminent subject specialists in respective areas. Thus, refereed full papers selected to be presented at the conference were published here. We do not assume any responsibility for any errors or omissions in the research papers which rests solely with the authors.

Special thank goes to Key note addresses & Co-chairs made by Dr. Chandana Kasturi Arachchi (CIHE Campus, Colombo) Mr. R. Buddhika Ranaweera (Department of Drama, Oriental Ballet and Contemporary Dance, University of the Visual and Performing Arts) Dr. Mathi Kandiah (Dean, School of Science, BMS, Colombo) Dr. Kalaivani Vivehananthan (Head, Department of Basic Sciences, Faculty of Health Sciences, The Open University of Sri Lanka) Dr. Jayamali De Silva (Senior Lecturer, Department of Textile and Apparel Engineering, University of Moratuwa) Mr. Manoharan Kesavan (Lecturer, Department of Construction Technology, Faculty of Technology, Wayamba University of Sri Lanka) The organizing committee special Appreciation Online Research Publications Partner NLSL's National Digital Library and Repository in Sri Lanka, an International Academic Affiliation with Jagadguru Kripalu University - India, Department of Community Medicine, Mysore Medical College and Research Institute - India, International Federation for Fitness Health, Physical Education & Iron Games - Saudi Arabia, Australasian Institute of Ayurvedic Studies - Australia, Kathmandu School of Law – Nepal, Noble School of Business, India.

Journal Partner as GARI Publishers and GARI International Journal of Multidisciplinary Research, all other GARI affiliated academic partners, Further the support given by GARI Tours as Travel partner, Official Creative Partner Sameera Artco & MICE official Partner Sri Lanka Convention Bureau. The conference committee expresses deep gratitude to the panel of reviewers for the priceless service rendered. Finally, the committee extends sincere thanks to the presenters and participants for the valuable contribution and active participation.

Conference Committee
GMS 2022

About GARI

Global Academic Research Institute (GARI) is an International Scientific Research Conference Organizer in collaboration with International Universities & Institutions. GARI has brought together leading academic and industry experts from the global community who process diverse experience and expertise in verity of scholarly or scientific disciplines. We established on 2010 as independent service provider then wider range of experience GARI became a powerful arm of scientific research conference organizer in the industry.

GARI AFFILIATIONS

National Digital Library and Repository – Sri Lanka



The National Library is mainly research and a reference library and it is the main library and information Centre in Sri Lanka. It intends to provide library resources as well as information to all Sri Lankans through the National Library. Powers and responsibilities of the National Library were clearly spelled out for the first time and this was a fulfillment of a long-felt need. It has become a herculean task to organize and introduce this new institution to the country and to the general public.

Jagadguru Kripalu University - India



Jagadguru Shree Kripaluji Maharaj envisioned a university that not only provides quality education but also aims at all-round personality development of the students, turning them into leaders in their chosen fields. The faculty at JKU are experts in their respective fields, with an intense desire to teach and guide the students to success. Regular interactions with industry leaders and opportunities to be part of various conferences and seminars broaden the students' horizons.

Kathmandu School of Law – Nepal



Kathmandu School of Law, established in 2000 AD as an affiliate of Purbanchal University, is a community-based, non-profit academic institution that upholds its unrestrained commitment for a pragmatic, research-based and community responsive legal education in the country. It was conceptualized within the ambit of non-profit movement dedicated to serve the need of an academically sound and functionally feasible legal education in Nepal.

Australasian Institute of Ayurvedic Studies – Australia



The Australasian Institute of Ayurvedic Studies is synonymous with quality and authentic education in Ayurveda. The Institute was founded in 1999 in Auckland, New Zealand and is proud to be the only training Institute in Australasia offering recognized Ayurvedic qualifications in both Australia and New Zealand.

International Federation for Fitness Health, Physical Education & Iron Games - Saudi Arabia



IFFPHPEIG was established in year 1995. It is one of the largest upcoming federation around the world. The Federation was established by the Honorary President Dr. Kaukab Azeem

Noble School of Business - India



Noble Institution will be a learning community that is focused on developing youngsters who will become leaders in an era of global competitiveness and technological advancements.

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INSTRUCTIONAL LEADERSHIP OF PRINCIPALS AND PROFESSIONAL DEVELOPMENT OF TEACHERS: EXPERIENCES OF COLOMBO SCHOOLS

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ABSTRACT

Among the global trends in educational leadership and management that have emerged over the past thirty years, few have been more significant, widespread, or persistent than the focus on understanding linkages between school leadership and learning in the aspects of instructional leadership of the principal and the professional development of teachers in the schools. The primary aim of this study is to investigate the effects of instructional leadership of the principal on the professional development of teachers in the schools of the Colombo educational zone. According to the onion model, this study selected interpretive research philosophy. Accordingly, it was selected qualitative research methodology and inductive research approach. Moreover, interviews and a questionnaire survey were used to gather data from the participants selected by the purposive sampling technique. Then the data was analyzed by administering the narrative data analyzing method. This qualitative research selected seventeen principals and teachers as participants from the schools in the Colombo education zone to collect data. The specific objectives of this study are: to identify the nature of professional development programmes implemented in schools; to recognize the relationship between professional development programmes and the curriculum implementation in schools; to reorganize the perception of the teachers on the importance of professional development programmes, and to identify appropriate strategies to improve the instructional leadership of principals towards developing teachers in schools. Professional development is determined by the principals who develop the school learning climate. There is a significant positive relationship between the principals who develop the school learning climate and the teachers' professional development. There is a strong positive and statistically significant relationship between managing the instructional program and the teachers' professional development. There is a strong positive and statistically significant association between the school learning climate developed by principals and the teachers' professional development. It was revealed that the principals as instructional leaders are taking steps to manage the instructional process of their schools. It was realized that the principals have been making appropriate steps for the development of the learning climate in schools. The professional development of teachers is one of the responsibilities of the principals of schools. It seems that, as instructional leaders, the principals are made steps for organizing even school-based teacher development programmes also. It was discovered that the majority of instructional leaders, and principals have taken action for the professional development of teachers in their schools. As the instructional leaders, and chief executive officers of their schools the principals have a prime duty for the implementation of the school total curriculum. According to the respondents of this study, they have made steps to properly implement the total curriculum in their schools.

Keywords: Instructional leadership; Professional development; Principals; Teachers; Instructional process

TRENDS AND POTENTIAL OF ECO-TOURISM DEVELOPMENT IN UTTARAKHAND HIMALAYA

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ABSTRACT

This paper examines the trends and potential of eco-tourism development in the Uttarakhand Himalaya by analysing both the potential of eco-tourism development and eco-tourism resource base. Data were gathered from the Uttarakhand Forest Statistical Diary 2017-18 and the Uttarakhand Eco-Tourism Corporation, Dehradun, respectively. The trends of eco-tourists' inflow in NPs and WLSs and revenue earned from it were examined. The key results from the data analyses depict that the Uttarakhand Himalaya has plenty of eco-tourism resource bases – six national parks (5006.76 km²), seven wildlife sanctuaries (2683.73 km²), and four conservation reserves (212.54 km²) along with rich faunal, floral, and avifaunal diversity. These resource bases have significant potential for eco-tourism development. The trends of eco-tourists' inflow in the NPs and WLSs are increasing, mainly domestic tourists ($r^2 = 0.941$). However, in comparison to natural and pilgrimage tourism, eco-tourists' inflow is low. In terms of the annual growth rate of eco-tourists' inflow, it has been decreasing ($r^2 = 0.168$). The main reasons for decreasing growth rate of eco-tourists' inflow were remoteness, fragile landscape, rugged terrain, geo-hydrological hazards, lacking infrastructural facilities – transportation, accommodation, and institutional support in eco-tourism destinations. This study recommends policy measures for eco-tourism development in the Uttarakhand Himalaya through the creation of eco-tourism circles, development of eco-tourism parks, and providing adequate infrastructural facilities – transportation, accommodation, institutions, and communication.

Keywords: Eco-tourism, national parks, wildlife sanctuaries, trends, eco-tourists' inflow, Uttarakhand Himalaya

FACTORS INFLUENCING UNDERGRADUATES' ACADEMIC MOTIVATION IN PRIVATE TERTIARY EDUCATION IN SRI LANKA

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ABSTRACT

In Sri Lanka, the limited capacity of the state higher education system has created an insistent requirement for private sector contribution. There is a lack of research on the private higher education service category as there is a lack of regulation demanding to provide statistics to a central authority. This study examined the academic motivation of undergraduates from private higher education institutes to determine the factors which influence their academic motivation. The objectives of the study were to identify the level of motivation, identify the critical factors that affect academic motivation and identify the relationship between identified critical factors and academic motivation. The study concludes that self-efficacy is one of the most influential factors for academic motivation in undergraduates from private higher education institutes in Sri Lanka.

Keywords: Undergraduate, Academic, Motivation

SHAPE OF THE TEACHER'S AND LEARNER'S AUTONOMY IN THE APPLICATION OF SRI LANKAN ESL CURRICULUM

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ABSTRACT

The teacher's and student's roles are bordered with a certain fraction of autonomy. Autonomy of learning and teaching necessarily combines the teacher and student as the teacher's activity bears implications to the student's learning activity. It is necessary for the curriculum to subsume a formidable allocation of resources to facilitate liberal enactment of teaching and learning. Curriculum can vividly exploit space to contain restrictions helping the stakeholders achieve individual bands of autonomy. While research on autonomy is available in the global literature, local contribution to studies on teacher or learner autonomy in ESL curriculum needs to be amplified. This research on Sri Lankan state education expects to bridge this gap. The teacher and learner autonomy is deliberated by a degree of independence for decision-making as predicated by the Sri Lankan ESL curriculum irrespective of the possibility that students' liberty is skewed by the teacher's style of interaction. It aims to evaluate prevalence and determinants of autonomy and occurrence of teachers' influence in learners' autonomy. The sample included teacher-students following Diploma in TESL at the National Institute of Education and teachers and students from several schools. Adhering to a mixed-methods framework, an online survey and an in-depth interview were conducted. The dataset was measured for statistics and the qualitative data underwent Thematic Analysis. It was established that teachers in ESL curriculum, despite systematic restrictions, make salient alterations in the syllabus, demonstrating autonomy of decision-making. Students locate autonomy in the ESL classroom, accompanied by freedom to select.

Keywords: ESL Curriculum, Learner Autonomy, Sri Lankan State Education, Teacher Autonomy

WOMEN'S POLITICAL REPRESENTATION AND PARTICIPATION IN LOCAL POLITICS: A STUDY OF LOCAL GOVERNMENT INSTITUTIONS OF WESTERN PROVINCE IN SRI LANKA

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ABSTRACT

Political Participation is one of the key avenues to ensuring equal representation. Though women constitute about 52.1 percent, more than half the other country's population their representation is nearly fourth in local government institutions. Participation in politics is considered a factor that can affect democracy and advance gender equality. The main objective of this study is to explore the concept of political participation and representation of women in the context of the local government. The study was based on primary data which was collected through personal in-depth interviews and using 200 questionnaires. A mixed research method was used to analyze data. Method of observation was used to gather information ground reality of women's political participation and representation. The finding shows that as a result of the newly introduced quota system, the representation of women in local councils dramatically changed; however, women's participation has not drastically improved. To uplift women's participation three essential areas have been identified. These areas are voting policy marking and decision-making.

Keywords: Women, Participation, Local Government

INTRODUCTION

Women's political representation and participation have been researched for more than five decades. The devolution of governance has opened a new window of

opportunities to increase the participation of women. Women's representation in local government has drastically changed from 1.9 percent to almost 25 percent in the 2018 election. The increase in women's participation in local government institutions can be viewed as an opportunity to strengthen the political representation and participation of women. However, adequate research has not yet been conducted on whether there is any positive change in women's representation and participation of women in local government.

Political Representation and Participation

There is extensive literature that offers many different definitions of political representation. Within this literature, authors agree that political representation consists of the articulation and presentation of political agendas of given groups by various actors in decision-marking arenas and key social forums in democratic societies (Penock and Chapman, 1968). Participation is a wider concept including more sides of participation (Brynard, 1996). As per the literature, participation is contingent upon representation. Better political representation guarantees higher political participation. The higher numerical representation ensures more effective participation in local government institutes. Political participation has different connections and definitions. In this study, political participation refers to

the involvement in the democratic political process including voting, contacting public officials, campaigning, running for and holding office, protesting, and volunteering.

METHODOLOGY

A mixed research method was used in this study. The study used both primary and secondary data in analyzing the representation and participation of women in local councils. Primary data was collected through personal interviews and survey questionnaires. 20 in-depth interviews were conducted and 200

questionnaires were used to collect data on women's participation in local councils who contested and gained office. In addition, a method of observation was used to gather the ground reality of the two concepts. Secondary data used here was gathered through a literature survey of relevant books, academic journals, reports, and legal documents.

RESULTS & DISCUSSION

Table 01: Percentages of selected women representatives in selected Local Government institutes in Western Province in Sri Lanka

Local Government institutes & Districts	Municipal Councils		Urban Councils		Pradeshiya Sabhas	
	Institute name	Sample & Percentage	Institute name	Sample & Percentage	Institute name	Sample & Percentage
Colombo	Colombo	24 (12%)	Seethawakapura	10 (5%)	Seethawaka	10 (5%)
	Kaduvela	12 (6%)	Maharagama	21(10.5%)		
Gampaha	Gampaha	20 (10%)	Peliyagoda	10 (5%)	Biyagama	25(12.5%)
			Ja el	10 (5%)	Kelaniya	20 (10%)
Kalutara	-	-	Panadura	10 (5%)	Horana	10 (5%)
			Beruwala	08 (4%)	Kalutara	10 (5%)

Table 01 – Selected 14 Local Government Institutes (Municipal Councils – 03, Urban Councils – 06, Pradeshiya Sabhas – 05) in western (with the highest number of female representatives) Sri Lanka. Used questionnaires for (Non - Random Sample) of the 200 Female representatives. According to the data obtained, Participation in Politics – Connected to elections – engage in any other political work other than voting – 68%. About women taking part in other political work, connected to elections in their areas – satisfied – 12%, Not satisfied – 88%. Identified reasons for the factors, that make a representation of women least, in the political field, Women show fear to engage in political work at the regional level: because political victimization,

defamation, and violence in elections are common during the period of elections, Women engage in political work, in regional elections, and the family economy influences directly the present social environment. Their job is a hindrance to engaging in political activities, Holding the responsibilities as a housewife and a mother is a hindrance to engaging in political work. Due to the quota method, introduced to the local government elections system, the enthusiasm of women has increased to participate in the political work connected to elections (in 23% Percentage). But, it is not enough in local government system in Sri Lanka.

CONCLUSION

Women's equal political participation and representation in local politics are essential to improve local democracy. Representation of women in local government exceeds 25 percent (the average) as a result of the recently introduced quota. Even though implementing the quota system has strengthened women's participation has not drastically boosted it. To improve the participation of women, favorable political culture and social environment are required. At the same time, three essential areas have been identified to uplift women's participation. These are

voting, policy marking, and decision-making.

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USE OF CORPUS - BASED APPROACH TO CREATE A LIST OF KEYWORDS FOR TEACHING VOCABULARY TO AGRICULTURE UNDERGRADUATES IN SRI LANKAN STATE UNIVERSITIES

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ABSTRACT

Corpus based teaching has become a useful approach in second language teaching with the advancement of technology. However, teaching is one of the fields where technology has a little impact according to Breyer (2008). Corpus Linguistics is one of the technology - based tools which has not been adequately used or experimented yet, but could be very useful in second language teaching. However, in recent decades, the use of corpora in classrooms has started to progress. For decades, a number of studies have been conducted on the application of corpus linguistics approach in pedagogical aspect. However, a little research has been done on the use of corpus based approach in ESP classrooms up to date. There are hardly any researchers who have focussed on using corpus linguistic tools to create keywords lists which will be helpful for vocabulary teaching in the ESP classrooms, specifically in Sri Lankan State Universities, and that void is addressed through the current study. The research is a quantitative study which is done by using AntConc Corpus Linguistic Tools to create the list of keywords by using the main corpus of the study. CAU (Corpus for Agriculture Undergraduates) is the main corpus of the study and BE06 Corpus compiled by Paul Baker serves as the reference corpus of the study. The analysis section commences with an exploratory process of identifying themes in the main corpus of the study and then, the keywords were categorized into groups thematically. Finally, a brief description of how these keywords can be used in the ESP classrooms to teach and develop vocabulary lesson was also given. Although, using corpora in language teaching is challenging, it has a big potential in ESP classrooms. Accordingly, the study will open the door to the field of Corpus Linguistics in ESP classroom in Sri Lankan university context.

Keywords: CAU, Corpus Linguistics, ESP classroom, Pedagogical aspect

TO EXAMINE THE DRAWBACKS OF THE E-LEARNING PROCESS FOR EARLY CHILDHOOD EDUCATION

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ABSTRACT

This paper is to examine the drawbacks of e-learning for early childhood education. At this time in the Covid -19 theater, an e-learning platform is being used by schools and institutions. During this arena, e-learning is the key form of education for students. Teachers resulted in early childhood education which has caused issues to these early learners, and also teachers and parents. Lack of facilities Specially in rural areas, due to the disturbances in the environment and also the child is not in a position to switch on the video while learning, limited time to interact with the peer-groups and teachers, too much of time in front of the devices, online examinations are not very successful and cheating can be occurred, poor internet connection specially when it comes to sudden failures of the power, lack of access to digital devices also the parents do not have a proper knowledge of English to handle them ,due to low income of the parents they are unable to provide many devices for each child, health issues with related to online learning have increased in many numbers, less opportunity to do outdoor games, challenge to make the child learning with related to 5 senses, the child's thinking ability / creativity will be less, online learning straight away affects the child rather than the teacher or the parents.

Keyword: e-leaning, early childhood Education, covid19 education

AN EVALUATION ON THE STUDENT PERCEPTION ON VIRTUAL AND ON CAMPUS LEARNING ENVIRONMENTS

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ABSTRACT

Active learning is considered as one of the best modes of learning among all the teaching architectures. However, along with the pandemic outbreak, the education domain in the world was severely disrupted. This paved way to a paradigm shift in the education sector from on campus learning to virtual learning environments. Accordingly, this research was based on a purposive sample of 52 students at level 3 and 4 of a Sri Lankan University. The results shows both negative as well as positive consequences of virtual learning environments. Generally, accessibility and affordability issues have been identified as the main practical barrier of virtual learning along with other issues such as concentration issues at home. However, results depict online learning have enhanced the self-placed learning of the students which is identified as one of the vital elements of active learning. Although the student perception towards online learning is relatively low compared to on campus learning, it does not imply that online learning cannot create an active learning environment. The results show that the active learning environment in online learning is approximately 3-10% lower than the on campus active learning environment. Therefore, it can be suggested that using the mixed method of online and on campus learning, which is the most preferred mode of learning of the students will bring out the advantages of both modes while creating an effective active learning environment for the students. Further, the usage of above-mentioned strategies along with a mixed mode of learning will create a safer and an interesting active learning environment for the students that will eventually develop their knowledge.

Keywords: Active learning, virtual learning, university education

WORLD HERITAGE TOURISM: A SPIRITUAL OUTLOOK

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ABSTRACT

There are various factors that are considered when nominating World Heritage Sites (cultural and natural). However, as to whether the heritage site emits positive or negative vibrations is not among the list of criteria. Research has shown that the spiritual positivity or negativity of a site/place has far-reaching effects on the environment and people. Using aura and energy scanners, the spiritual research team at the Maharshi University of Spirituality studied the subtle vibrations emitted by soil and water samples collected from over 150 heritage and tourist sites across the world. The aim was to assess the spiritual vibrations that these sites emitted. It was found that over 80% of the heritage and tourist sites emitted negative vibrations. Some sites which are renowned for their beauty emitted high levels of negative vibrations. The shape, the purpose of the site and the people that used it, all contributed to whether the site would emit positive or negative vibrations. On the other hand, samples from sites associated with the practice of Spirituality as per universal principles emitted positive vibrations. The study shows that the selection criteria for nominating heritage sites and promoting places of tourist attraction would be more holistic if they were to include the subtle vibrations associated with the site. Sites that emit high positive vibrations should be promoted over those that emit negative vibrations. This would qualitatively enhance the selection process of heritage sites.

Keywords: Subtle vibrations, Aura, Heritage sites, Environment, Tourism

THE STUDY OF THE FEASIBILITY OF USING DANCE STIMULANTS AS A EXERCISE METHOD FOR DEVELOPMENT OF ACTING

නළු කාර්යය වර්ධනයෙහිලා රංග අභ්‍යාසයක් ලෙස නර්තන උත්තේජක භාවිත කිරීමේ
ශක්‍යතාව පිළිබඳ අධ්‍යයනයක්

ඩී.එම්. දේවාංගනී රංගනා

ලලිතකලා අධ්‍යයන අංශය , කැළණිය විශ්වවිද්‍යාලය

නළුවා විසින් කිසියම් නාට්‍යයක පෙළ, එසේත් නැතිනම් නාට්‍යමය ජවනිකා ප්‍රේක්ෂකයා හමුවට ගෙන එනු ලබයි. ස්වකීය අභ්‍යන්තර ශක්තිය ප්‍රබල වූද, එය සාමාන්‍ය පුද්ගලයෙකුට වඩා වර්ධනය වූද, පුද්ගලයෙකු තම ශරීරය නිර්මාණාත්මක ප්‍රකාශනය සඳහා යොදා ගනු ලබයි. අභ්‍යන්තරිකව ගොඩනැගෙන එම ශක්තිය විසින් අන්‍යන්ගේ වර්තන අනුකරණය කොට, ආවේණික ඉරියව් පළකරමින් හැසිරීමට පුද්ගලයා පොළඹවනු ලබයි. නළු කාර්යය තුළින් ජනනය වන්නේ එකී නිර්මාණාත්මක පරිග්‍රහයේ දෘශ්‍යමය අත්දැකීමයි. ස්ටෑනිස්ලාව්ස්කිට අනුව නළුවකු වීමට ප්‍රතිභාව සහ නිර්මාණවේශය පමණක් ප්‍රමාණවත් නොවේ. රහපැම වෙනුවට නළුවා ස්වකීය අධ්‍යාපනය, පරිකල්පනය, පෞද්ගලික අත්දැකීම් හා ගවේෂණයන් තුළින් වර්තය ගොඩනැගීමට අවශ්‍යය අමුද්‍රව්‍ය සපයා ගත යුතුය. රංගනය ඉගැන්විය නොහැකිය. එය පුහුණු කල යුත්තකි. අවබෝධය සහ අභ්‍යාසය තුළින් නළුවා තමාට හිමි අවකාශය තුළ ජීවත් කරවීමට අවශ්‍ය මිනිස් ශක්තිය, බුද්ධිය හා පරිකල්පනය පුබුදුවා ගන්නා බව ඔහුගේ මතයයි. නළු කාර්යයෙන් ව්‍යුක්ත වූ චලනය මාධ්‍ය කොටගත් නර්තනය තුළ ශාරීරික හැඩතල , අංගහාර, චලන විධික්‍රම නිර්මාණය කර ගැනීමෙහිලා මෙන්ම අර්ථ නිරූපිත චලන සංවර්ධනයෙහිලා ගැණෙන අභ්‍යාස ක්‍රමයක් ලෙස නර්තන උත්තේජක හඳුන්වා දිය හැකිය. ස්වාභාවික චලන භාෂාව නර්තන ශිල්පීන් සඳහා පහසුවෙන් වාග් කෝෂයක් නිර්මාණය කරයි. නර්තකයින් මෙය නිර්මාණයට පදනමක් ලෙස භාවිතා කළද නිර්මාණයේ අවශ්‍යතාවය මත චලනයන්හි අන්තර්ගතය විශ්ලේෂණය කිරීමේ ක්‍රමයක අවශ්‍යතාවද ඉස්මතු කරන අතරම එහි ස්වාභාවික මානව රටා නර්තන රටා බවට පරිවර්තනය කිරීමද සිදුකරයි. නර්තන උත්තේජක ශ්‍රව්‍ය, දෘශ්‍ය, චලග්‍රහන, උපායශීලී සහ සංකල්පන වශයෙන් පස්වැදෑරුම් වෙයි. සංගීතය, ශබ්ද, සංවාද, ඇතුළත් ශ්‍රව්‍යමය සාධකද, පින්තූර, චිත්‍ර, මූර්ති , වස්තූන්, රටා ආදී දෘශ්‍ය සාධකද, ශාරීරික චලනයද, උපායශීලී පෙළඹවීම්ද, නිර්මාණාත්මක සංකල්පයන්ද මෙහිදී අභ්‍යාස සඳහා පාදක කරගත හැකි මූලාංගවේ. චලන සහ අර්ථ ජනනයට ඉවහල් වන මෙකී උත්තේජකයන් රංගකාර්යය නැතහොත් නළු කාර්යය සඳහා නළුවකුට ස්වකීය මනෝමූලික හැඟීම්, භාවයන්, ආංගික හා සාත්වික අභිනයන් මෙන්ම නිර්මාණාත්මක චිත්තනයන් හා රචනයන් පෝෂණය කරගැනීමෙහිලා භාවිත කිරීමට හැකිබව පෙන්වාදීම මෙහි අරමුණයි. නළු කාර්යය අවකාශය තුළ උත්තේජකයන්ගේ හැසරවීම, ශක්‍යතාවන් සහ ස්වභාවයන් පිළිබඳවද පුළුල් අධ්‍යයනයක් කිරීමටද මෙහිදී අපේක්ෂිතය.

ප්‍රමුඛ පද : නළුවා සහ රංග කාර්යය, චලන, නර්තන උත්තේජක

A STUDY ON THE CHARACTER OF BIKKHU IN SRI LANKAN TELEDRAMA

ශ්‍රී ලාංකික ටෙලිනාට්‍ය කලාවේ නිරූපිත භික්ෂුව පිළිබඳ අධ්‍යයනයක්

එම්.ජේ.එස්.ආර් හේමචන්ද්‍ර

මානව ශාස්ත්‍ර පීඨය ,කැලණිය විශ්වවිද්‍යාලය

මිහිඳු මහරහතන් වහන්සේගේ ආගමනයත් සමඟ වර්ථමානය දක්වා ලාංකික සිංහල ජන සමාජය තුළ විශේෂ සමාජ තලයක් නිරූපණය කරන ලද සමාජ ඒකකයක් ලෙස භික්ෂුව හැඳින්විය හැක. එය සිංහල ලාංකීය ඉතිහාසයේ වර්ග දෙදහස් ගණනක් ඇත ඉතිහාසය දෙස හැරී බැලූවිට පැහැදිලිව දෘෂ්‍ය වේ. ලාංකේය ගිහි ජන ජීවිතය හා බැඳුණු කුටුම්භ ජීවිතයේ දරු උපතක සිට මරණය දක්වාත් රාජ්‍ය පාලනයේ දී ත් භික්ෂුවගේ හා භික්ෂු සංස්කෘතිය ලාංකේය ජන ජීවිතය හා සම්බන්ධතාව බැඳී පවතින්නකි. සෝප් ඔපෙරාවෙන් බිහිවන ටෙලිනාට්‍ය කලාව විවිධ වූ සමාජ සංස්කෘතික අන්‍යතාවයකින් යුතුව නිර්මාණය විය. දිමුතු මුතු, පළිගු මැණිකේ සිට විවිධ ශානර වලට අයත් නිර්මාණයන් සහිතව ලාංකීය ටෙලිනාට්‍ය බිහිවන්නට විය සමාජ පරිණාමයන් වල ප්‍රතිපලයක් ලෙස ටෙලිනාට්‍ය සිය ප්‍රධාන අරමුණ වන සෘජුව කතාවක් කීම වෙනුවට සමාජ දේශපාලනික මැදිහත්වීම් සහිතව නිර්මාණ බිහිවිය. මුල් කාලීන ලාංකේය ටෙලිනාට්‍ය වල පටන්ම මෙම භික්ෂු චරිත කතාවේ ගලායෑමට විවිධ අයුරින් ගැලපෙන ආකාරයට භාවිතා කිරීමට නිර්මාණ කරුවන් උත්සහගෙන ඇත. විවේක ග්‍රාමීය ජන ජීවිතය තුළ ප්‍රධාන බලවේගයක් ලෙස, විවේක කතාවට පාදක වන මුඛ්‍ය චරිතයක් ලෙස ත් නැතිනම් නිර්මාණකරුවාගේ සමාජීය පණිවිඩය ටෙලිනාට්‍ය ඔස්සේ ප්‍රේක්ෂකයාට සම්ප කරවන වාහකය ලෙසද ටෙලිනාට්‍ය තුළ භික්ෂු චරිතය අපට දැකගත හැක. වර්ථමානය වන විට සාමාජීය වෙනස්වීම් වැඩිවෙත්ම භික්ෂු සංස්කෘතියද ඒ හා සමාන විපර්යාසයන්ට ලක්වේ. ඒම සමාජ වෙනස්වීම් ඔස්සේ තම මතය නිර්මාණය මගින් සමාජ ගත කරවන විට නිර්මාණකරුවන් බහුල ලෙස ග්‍රාමීය භික්ෂුවගේ චරිතය ටෙලිනාට්‍යයේ යෙදවීම ටෙලිනාට්‍යකරණයේ නව ප්‍රවණතාවයකි. වර්ථමානයේ ලංකාවේ බිහිවන ටෙලිනාට්‍ය තුළ නිරූපණය වන භික්ෂු චරිතය ඔස්සේ සැබෑ ග්‍රාමීය භික්ෂුවගේ සංස්කෘතික ජීවිතය නිරූපණය වේද යන්න අධ්‍යයනය කිරීම මෙම පර්යේෂණයේ අරමුණ වේ. ටෙලිනාට්‍ය අධ්‍යක්ෂකවරුන් තම නිර්මාණ තුළ භික්ෂු චරිතය නිරූපණයේදී කාලීන සමාජ තත්වයට අනුරූපව භික්ෂු චරිතය ගොඩනඟා තිබීම දැකගත හැකි විශේෂ කරුණකි. එහිදී වර්ථමානයේ සැබෑ ග්‍රාමීය භික්ෂුවගේ සංස්කෘතික ජීවිතය හා ටෙලිනාට්‍ය තුළින් නිරූපිත භික්ෂු චරිතය අතර ඇතිවී තිබෙන සමාජ සටහනයන් පිළිබඳ මෙහිදී අවධාරණය කිරීමට අපේක්ෂිතය.

සූච්ඡි පද ටෙලිනාට්‍ය, ග්‍රාමීය භික්ෂුව, භික්ෂු චරිතය

**AN INSIGHTFUL STUDY OF MODERN DRAMA FORMS AND BHARATA
MUNI'S EXPLANATION OF ABHINAYA AND NRITT, NRITTA, NĀṬYA
CONCEPTS**

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ABSTRACT

Eastern and Western theorists and creators have expressed different views on what drama is. But with the experimentation of new theatrical forms came new ideas of what theater was. Aristotle's "The poetics" and Bharata Muni's "The Nāṭyaśāstra", can be described as two books that contain ideas about Eastern and Western dramas. In the definition of drama in each of his works, Bharatamuni has distinguished three concepts of nritya, nritya, nāṭya based on the concept of gesture. In it, it is stated that there is no verbal gesture (vācika abhinaya) in nritya, nritya and the verbal gesture of drama(nāṭya) is absolutely present. Further, Bharatamuni commenting on this in "The Nāṭyaśāstra", says that great care should be given to the word and it is accepted as the body of the drama. Nonetheless, whether that idea is still acceptable in the context of modern drama productions has been disputed. For example, "non-verbal" theatre Productions have been created in the theater world. there is no verbal communication and there only use two or three gestures. Research Objective: The purpose of this research is to bring an academic opinion on whether the concept discussed by Bharata Muni about nāṭya through The Nāṭyaśāstra can be compared with modern drama forms.

Research Problem: Can Bharata Muni's four gestures and the concept of nritya, nritya, nāṭya be accepted in contemporary theatre?

Methodology: This research is done through the use of theoretical data and participative observations, and interviews on modern theater productions.

Key words: Drama, The Four Gestures, nritya - nritya - nāṭya , non- verbal Theatre

RECONTEXTUALIZING FORM OF DANCE IN POLONNARUWA ERA

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ABSTRACT

Dance is an anthropological aspect in all cultures in the world and it has been popular in the the developed or undeveloped human societies all over the world. Historical sources emphasize that Sri Lankans had very well developed a specific art of dance and we find more evidence since Anuradhapura era to Kandy era. As no one has carried out any study on this theme, it is impossible to have a comprehensive knowledge on the art of dance during the Polonnaru period, from 1017 – 1215. It is believed that dance was a ritualistic feature of this period and the style is similar to that of South Indian devadasi dance. Devadasis were dancing girls who used to be addressed as servants of God and they were symbols of communicating religious aspects in India. According to the historical sources of polonnaruwa era, there were dancing girls (Devadasis) who danced as a ritualistic feature. There are many archeological sources depicting dassiattam style which emphasizes the dasiattam above era. The main objective in this research article is to recontextualize the dance which established in Polonnaruwa period. Recontextualize dance as a cultural phenomenon which interrelate with cultural aspects which was recorded in the above era. Therefore, this research is processing on interdisciplinary methodology. Using comparative framework, it utilizes the basic concepts of choreography techniques such as Laban techniques, improvisation & site specific. Exploring the ancient dance forms, it is thereby expected to launch a memorable creation of the dance of Polonnaruwa era.

**CREATED PURPOSE OF "BHAERITHTHUNGA WANNAMA" TO ELIMINATE
MISCONCEPTION REGARDING TRADITIONAL DRUMMERS IN SRI LANKAN
SOCIETY**

**බෙර වාදන ශිල්පියා පිළිබඳව ශ්‍රී ලාංකේය ජන සමාජයෙහි පවතින ගර්භිත සමාජාකල්ප
ශෝධනය උදෙසා නිර්මිත "හේරිත්තුංග වන්තම"**

රත්නාමර ඩී.එල්.අයි.එස්

වාද්‍ය සංගීත අධ්‍යයනාංශය, නර්තන හා නාට්‍ය කලා පීඨය, සෞන්දර්ය කලා විශ්ව විද්‍යාලය, ශ්‍රී ලංකාව

ශ්‍රී ලාංකේය ආණ්ඩුක්‍රම විකාශනයෙහි බහුක්‍රම රාජාණ්ඩුක්‍රම වෙයි. රජු මූලික වූ පාලන තන්ත්‍රයෙහි රජුගේ පාලනයේ පහසුව තකා විවිධ වූ කුල ක්‍රමයන්ට වර්ගීකරණය විය. පූර්වජයන්ගේ ස්වයං අධ්‍යයනයන්හි ඵලයක් වශයෙන් බෙරය නම් වූ අවනද්ධා භාණ්ඩය නිර්මාණය වන්නට ඇත. රජු සතු සංකේතරූපී වස්තූන් අතරින් දළදාව සුවිශේෂී වෙයි. දන්ත ධාතූන් වහන්සේ විෂයෙහි ශබ්ද පූජා විධි පැවැත්වීමේ අරමුණෙන් සහ රජු පිත්තීමේ විනෝදාස්වාදක මාධ්‍යක් වශයෙන් ශ්‍රී ලාංකේය බෙරවාදන කලාව විකාශනය වන්නට විය. එකී කලාවෙහි පැවැත්ම උදෙසා වූ අනිවාර්ය සාධක බෙර වාදන ශිල්පියා සහ වාදන භාණ්ඩය වෙයි. එකී වාදන ශිල්පීන් බෙරව / නැකති" බෙරකාර සහ පණික්කි යන කුළයන්ගෙන් පැවතෙන අදාලව සාම්ප්‍රදායික ශිල්ප ඥානය ගෝල පරම්පරාව වෙත සංචාණනය කරමින් ශ්‍රී ලාංකේය සංස්කෘතියට ආවේණික වූ බෙර වාදන කලාවක ප්‍රමාණය උන්නතිය උදෙසා බෙර වාදන ශිල්පියාගේ දායකත්වය අතිමහත්ය.

නමුදු පැවති, පවතින සමාජ ක්‍රමයන්හි කුළහින සමාජ පිරිසක් වශයෙන් බෙර වාදන ශිල්පීන් හැඳින්වීම සහ කටයුතු කිරීම ජන සමාජයෙහි එකී වාදන පරම්පරා පරිහානියට පත් වීමට බලපා ඇත. නමුදු සමාජයෙහි පීඩක සමාජ කොටසක් වශයෙන් අප්‍රතහිත ඓතිහාසයෙන් යුතු ලාංකේය කලාවෙහි උන්නතිය උදෙසා කටයුතු කළ, කරුණු ලබන පිරිස් අද්‍යයනයෙහි ද තම මූලික පීඨනෝපායමාර්ගය හදුන්වනු ලබන බෙරකාර පණික්කියලාගේ, බෙරකාර නැකතියගේ ආදී වාසගම් සහ පටබැඳි නාමයන් භාවිත කරමින් කලා ක්ෂේත්‍රයෙහි උන්නතිය උදෙසා කටයුතු කරනු ලබයි.

ප්‍රාසංගික කලා ශිල්පීන් වශයෙන් ඉදිරිපත් කෙරෙන ඇතැම් කලාංගයන්ගෙන් සමාජයට බෙරවාදන ශිල්පියා ව උපහාසාත්මක චරිතයක් වශයෙන් චිත්තරූපයක් ගම්‍ය කිරීම නොසතුටට කරුණකි. උදාහරණයක් ලෙස අණබෙර කෝළම ආදී කෝළම් නාටක අවස්ථා ඉදිරිපත් කිරීමේදී බෙර වාදකයා යනු බේබදු,සල්ලාල දිවි පෙවකක් ගත කරනු ලබන පුද්ගලයෙකු බවට ආකල්පයක් සාමාන්‍ය ජනතාවට සම්ප්‍රේෂණය කරනු ලබන්නේ කලාකරුවා විසින්මය.

නමුදු කුඩා කළ සිටම තම පාරම්පරිකව පැවතා ශිල්ප ඥානය අවශෝෂණය කරගනිමින් ප්‍රායෝගිකව හා න්‍යායාත්මකව අභ්‍යාසයකරනයෙන් පරිනතව දේශීය කලා උරුම අනාගත පරම්පරාව වෙත සම්ප්‍රේෂනය කරනු ලබන, දැනේ කරගැටුම තල කලා කායික සහ මානසික වේදනා විද්‍යාරාගනිමින් සුජාතවත් වූ කලාංගයන් විකාශනය කරනු ලබන උත්තුංග කලා රස කාමී පිරිසට උපහාරයක් වශයෙන් මෙම "හේරිත්තුංග වන්තම" නිර්මාණය කරන්නට වූ අතර අද්‍යයනයේදී දේශීය නර්තන හා වාදන නිර්මාණකරනයේදී අප්‍රවලිත තිත් රූපයක් වන 123/1234/1234 මාත්‍රා 11 කුන් තිත්ව අයත් තාල රූපයකින් යුතුව අද්‍යයන කලා ක්ෂේත්‍රයෙහි නියැලෙන සහාද කලාකාමී සදහා පිරිස් සමග වූ සාකච්ඡාවක් හා මත විමසීමේ සමාජ විද්‍යා පර්යේෂණ ඵලයක් ලෙසත් ශ්‍රී ලාංකීය ජන සමාජයෙහි ගැබ්ව පවතින බෙර වාදන ශිල්පියා පිළිබඳව වන ගර්භිත සමාජාකල්පය ශෝධනය උදෙසා භාවිත කල හැකි උපදේශන මාධ්‍ය කලාංගයක් ලෙස "හේරිත්තුංග වන්තම" මෙලෙස නිර්මාණය වන්නට විය.

ප්‍රමුඛ පද,

බෙර වාදනය, වාද්‍ය භාණ්ඩය, හේරිත්තුංග වන්තම, බෙරවාදන ශිල්පියා.

THE STUDY ON IMPACT'S OF CONTEMPORARY "HINGLISH" LANGUAGE TOWARD DECLINE OF TRADITIONAL INDIAN STAGE PLAY

සාම්ප්‍රදායික ඉන්දියානු වේදිකා නාට්‍ය කලාවේ පිරිහීම සඳහා නූතන ඉන්දියානු හිංග්ලිෂ්
(Hinglish) භාෂා ප්‍රබෝධයේ බලපෑම පිළිබඳ අධ්‍යයනයක්

ඩී.එම්. දේවාංගනී රංගනා

ලලිතකලා අධ්‍යයන අංශය , කැලණිය විශ්වවිද්‍යාලය

ඉන්දියානු ජන නාටක ආභාෂයෙන් මූලාරම්භය සනිටුහන් කරනු ලබන ඉන්දියානු වේදිකා නාට්‍ය කලාව, රාමායණය මහාභාරතය මූලාශ්‍ර කරගත් කතාවස්තූන් නිර්මාණයන් සඳහා පාදකකොට ගනී. දකුණු ඉන්දියාව , උතුරු ඉන්දියාව ලෙස විවිධ ප්‍රාදේශීයකරණයන්ට භාජනය වන ඉන්දියානු නාට්‍ය කලාව හින්දි, තෙලිගු, දමිළ, කණ්ණඩ ආදී විවිධ භාෂා ප්‍රභේදයන් ගණනාවකින්ද විකාශනය වෙමින් පවතී. හින්දි සහ සංස්කෘත භාෂාවෙන් ඉපැරණි නාට්‍ය රචනා වුවද වර්තමානය වන විට සම්කාලීන කතා වස්තූන් පදනම් කරගත් ව්‍යවහාරික, ජනප්‍රිය භාෂාවෙන් නාට්‍ය කෘතීන් රචනා වීම ප්‍රචලිත වෙමින් පවතී. අංකුර නාට්‍යකරුවන් මෙන්ම, තරුණ නාට්‍යකරුවන් අතර මෙය වඩාත් ජනප්‍රිය ස්වරූපයක් ගනී. භාෂාව යනු සමාජ නිර්මිතයකි. එහිදී සමාජීය කාර්යයන්ට මුල්තැනක් හිමිවේ. භාෂාමය පද්ධතියක් නම් , අර්ථමය වෙනස්කම් මාලාවක් සමඟ බැඳුණු ශබ්දමය වෙනස්කම් මාලාවක් ලෙසද අර්ථ දැක්විය හැකිය. හින්දි යනු ඉන්දියාවෙහි නිල භාෂාව වන අතර වර්තමානය වන විට එහි ඉහත කී අර්ථමය හා ශබ්දමය වෙනස්කම් සිදුවෙමින් පවතී. ඉන්දියාව යටත්විජිතයක් වූදා සිට හින්දි සහ ඉංග්‍රීසි අතර පැවති අනියම් සම්බන්ධතාවය හේතුවෙන් හින්දි , ඉංග්‍රීසි සමඟ මිශ්‍ර වීමට පටන්ගත් අතර ඉන්දියානු සමාජය තුළ "හිංග්ලිෂ්" ලෙස මෙය ජනප්‍රිය විය. සාමාන්‍ය ව්‍යවහාරික ප්‍රභවයක් බවට පත්වූ "හිංග්ලිෂ් " සම්මත හින්දි භාෂාවට අභියෝගයක් වෙමින් ජනප්‍රිය භාෂාවක් ලෙස සිහුයෙන් පැතිර යයි. සාම්ප්‍රදායික හිංදි භාෂාව ඒ තුළ ගිලී පවතී. පුද්ගලාන්තර මෙන්ම ජන සන්නිවේදන විෂයෙහිද ප්‍රබල සාධකයක් බවට පත්වූ හිංග්ලිෂ් වත්මන් ඉන්දියානු වේදිකා නාට්‍ය විෂයෙහි කොතෙක් දුරට බලපෑම් සිදුකර ඇත්දැයි අවධාරණය කිරීම මෙම ලිපියේ අරමුණයි. එහි ප්‍රතිඵලයක් ලෙස අභියෝගයට ලක්වන සම්මත සාම්ප්‍රදායික හින්දි සහ සංස්කෘත භාෂාවෙන් රචනා වූ වේදික සාහිත්‍ය මූලාශ්‍ර, වේද ග්‍රන්ථ, වීර කාව්‍ය ආදී සාධකයන් පිළිබඳවද මෙහිදී අවධාරනය කිරීමට අපේක්ෂිතය. ඉන්දීය නාට්‍ය රචකයන්ගේ බොහෝ නාට්‍ය පිටපත් ඉංග්‍රීසි බසට පරිවර්තනය වී ඇති අතර ඒවා ඉංග්‍රීසි භාෂාවෙන්ම වේදිකා ගත කිරීමද බහුල ලෙස දක්නට ලැබේ. සම්පූර්ණයෙන් හින්දි භාෂාව නාට්‍ය කලාව තුළින් බැහැර කිරීම උචිත නොවන්නේ ඉන්දියානු සාමාජීය, සංස්කෘතික, දාර්ශනික සාධකයන්හි හරය ඒ තුළින් ගිලී යන බැවිනි. නූතන ප්‍රේක්ෂකාගාරය විසින් සම්මත භාෂාවන් ප්‍රතික්ෂේප කිරීමත් , නාට්‍ය නිෂ්පාදනයන්හි අර්ථ නිරූපනයන්ට මෙන්ම ගැඹුරු සාහිත්‍යමය විග්‍රහයන්ට එල්ල වී ඇති බලපෑමත් වැඩිදුරට මෙහිදී සාකච්ඡා කිරීමට අපේක්ෂිතය.

ප්‍රමුඛ පද : ඉන්දියානු නාට්‍ය කලාව, භාෂාව, හිංග්ලිෂ්

STRUCTURAL HANDLING OF MATERIAL MOVEMENTS AND STRUCTURIZATION IN A STAGE-PLAY: A STUDY

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ABSTRACT

The discussion about “material” has been a subject of complex discussions for some time. the contribution of human beings in the historical journey of the "material" is still debated today. Both idealists and materialists present different views on whether the matter is a separate state or a non-temporal state, and what is the quality of matter. On the stage, artists use materials that are sensitive to human beings to express their images. From the beginning of drama to contemporary futuristic drama, the use of material objects in a drama has tried to take a different shape. That is because of the complexity of the expressive quality within the material form. Based on this situation, there has been an appeal to the intelligence of the audience watching the play. The creative thinking of the audience is enhanced in contemporary plays due to the use of forms that are different from the shapes of the materials used on the stage. Structuralizing occurs when a person's mind is tempted to believe in a material model or behavior in a stage play. For example, when scenes of suicide are shown on television, the individual's mind is Structured to that method of suicide. the audience, the material used on the stage is structurally modeled as such within a few minutes, and plays are watched from.

Purpose of the research: To explore the impact of the use of the material in a stage play on the audience in contemporary stage plays.

Research Problem: What effect does the use of material models in contemporary theater have on theater audiences?

Research Methodology: This research is conducted through participant observation and interviews by studying the use of props and backdrops used in contemporary stage plays

Keywords: Material, Structure, and being Structurizing, Materialistic movement, Spectacle

HOW COLOUR AND DESIGN CAN AFFECT THE SPIRITUAL VIBRATIONS OF TEXTILES AND FASHION

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ABSTRACT

When people choose any colour or design, they rarely consider the spiritual effect and mainly let aesthetics guide their choices. A survey (1000 respondents) indicated that people have a strong preference for the colour black. Black was either first or second in their minds when it came to being identified with qualities such as confidence, intelligence and attractiveness. Having studied the subtle attributes of objects for over 4 decades, the Maharshi University of Spirituality has evidence to suggest that colours and design affect people at the spiritual level. Using aura and subtle-energy scanners along with the advanced sixth sense of its research team, it was found that colours and designs emit positive or negative vibrations. Among colours, black and among designs, anything that is complex to look at, are more likely to emit subtle negative vibrations. Such subtle vibrations will accordingly affect the wearer spiritually. Very often fashions and trends that gain immense popularity are spiritually negative in nature, thus adversely affecting the unsuspecting wearer. The materials used also have their own vibrations. For example, silk and cotton are found to have the purest subtle vibrations while manmade materials such as spandex and nylon are more likely to emit negative vibrations. Other factors such as the style of clothing also make a significant contribution. In addition to protecting one from the elements, clothes should also protect one spiritually. However, depending on how they are made, they can either leave the wearer spiritually vulnerable or spiritually protected.

Keywords: Colour, Colour science, Textiles, Fashion, Garments

A HEALTHY FORMAL WEAR COLLECTION WITH VIBRATION THERAPY FOR UPPER CLASS WORKING WOMEN

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ABSTRACT

Lower and upper back pain can be defined as the most generic cause of work-related disability. Stiffness and tension on muscles, bones, cartilages and nerves caused by sitting for longer hours has led to this issue. Stress, anxiety, depression, mental stress at work can be identified as risk factors. So, project-based research was carried out to address this issue through the field of fashion and product development. Initially, primary research was carried out in the mode of survey through a questionnaire targeting the working women within the context of Colombo and suburbs. It was found out that the majority of them within the age of 30-45 suffer from lower and upper back pain. Interviews were carried out with respective resource persons as physiotherapists and specialist doctors to identify and understand the targeted problem further. So, to address this issue a formal wear collection for women aged between 30-45 was created under the concept of “Happy Aura” inspired from “Cyrace Nigricans” Sea Slug by incorporating a specific vibration therapy mechanism. This project-based research has been strengthened by market research, trend research in order to identify a viable consumer segment and align with the latest fashion trends. A comprehensive design development process was carried out in order to achieve the target consumer requirements considering both technical and aesthetic aspects.

Keywords: Vibration therapy, Formal wear, Fashion

INTRODUCTION

Relationship between the lower and upper back pain and extended standing and sitting at work has been distinctly shown through various researches conducted. Lower back pain affects almost 80% of the population at some point in their lives (Zheng, Zhang, & Peng, 2018). According to (Tissot, Messing, & Stock, 2009) lower back pain is a main occupational health problem in many industrialized countries. Nowadays sedentary lifestyle has widely encountered and it has increased the time period which individuals remains in a seated position at work even during their leisure time. So, simultaneously it has increased the back pain in office workers. Lower back pain has a significant impact on individual workers and their families directly and indirectly. According to the (Yang & Haldeman, 2016) health care expenditure which is direct has been reported from ranging from 50 to 90.7 billion US dollars yearly in the US and it has become a major economic burden to society. In Sri Lankan context also, same issue was identified through a survey within the project. According to the survey conducted this issue is prominent in Sri Lankan working women. The combination of demanding targets with long working hours with vigorous demands of household chores

takes a toll on a woman's health. Ignoring the symptoms of back pain longer time has converted it to chronic back pain. Exercise therapy can be defined as the most used non-surgical intervention for back pain in practice. Currently, whole body vibration exercise (WBV) is becoming famous in providing relief for musculoskeletal pain (Zheng, Zhang, & Peng, 2018). In worldwide context some significant researches have carried out on fashion and vibration therapy as a solution for back pain. "Vibe-ing" is a selfcare tool that constructed using merino wool garment with pockets and circuits which makes the body feel, move and heel through vibration therapy. This has specifically targeted for osteoporosis patients. (Vibe-ing, 2013). Apart from that some intimates and back braces were developed to support the back while working. (What are the Benefits of Wearing a Back Brace?, 2019). In Sri Lankan context no specific studies were carried out on vibration therapy incorporating fashion and product development as a solution for the back pain. So, this design-based research will be a prominent study in vibration therapy and in the field of fashion as a solution to the back pain in working women in urban contexts of Sri Lanka.

METHODOLOGY

In Sri Lankan context majority of the working women suffer from back pain due to the sedentary postures that they are used to adhere within the working environments for longer hours. So, through this design-based project an approach was taken to give a solution for this issue by incorporating vibration therapy mechanism and the field of fashion and product development. Initially customer research was carried out using a structured questionnaire in the form of survey to understand the issue deeply and identify the requirements and needs of the customers. Then a structured interview

was carried out incorporating patients who are suffering from back pain due to the incorrect postures practiced in workplaces. Some interviews were done incorporating the physiotherapists and specialist physicians to get more information on the issue. Further studies were carried out on physiotherapy techniques and acupuncture points. In physiotherapy specific massage types use vibration therapy to heal and reduce the pains. Acupuncture is a form of treatment that involves inserting very thin needles through a person's skin at specific points on the body to various depths. Acupuncture will insert needles into a person's body to balance their energy. It has claimed that it can help boost well-being and may cure some illnesses. So, approach was taken incorporating these two techniques; physiotherapy and acupuncture. Then further researches were carried on different techniques used to create pressure on acupuncture points in physiotherapy. Through that research it was identified that vibration therapy is popular and effective in creating pressure for relief. So, it was decided to develop wearable garment for working women who are suffering from back pain using vibration therapy mechanism. As an inspiration "Cyrace Nigricans" Sea Slug was selected considering its movement and aesthetic aspects. Formal wear was selected as the clothing category to develop the collection under the concept of "Happy Aura".

RESULT

As the result a formal wear collection was created targeting women who suffer from back pain within the age of 30 to 45 in the context of Colombo and suburbs of Sri Lanka incorporating a vibration therapy mechanism to relief back pain that cause due to the sedentary positions within the work places for longer hours. Comprehensive experiments were done in

developing circuit structures and achieving aesthetic aspects of the garments.

The following shows the final outcome of the design-based research

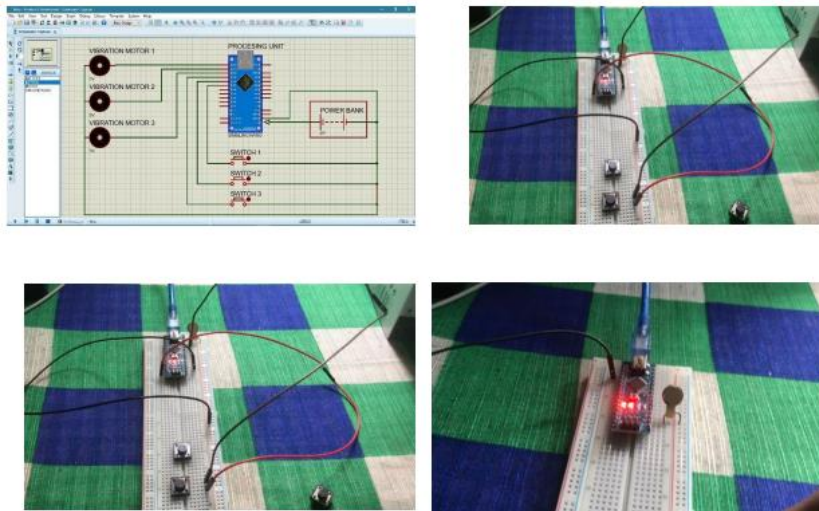


Figure 1 Vibration speed counting testing for a minute and voltage testing



Figure 2 Final Collection

DISCUSSION

When considering the back pain, in this project three specific areas of the back was considered to provide the therapy as upper back, lower back and neck. Acupuncture points on those areas which are safe to give therapy were identified and placing of the vibrating equipment was planned. Based on that decided the size and amount of pressure and time to provide the vibration. So, many experiments were conducted to get the right speed, frequency, hardness for a specific period of time based on the voltage provided. It was tried to get a vibration rhythm similar to the movement of the inspiration “Cyrae Nigricans” Sea Slug but was not quite successful with the time limitation. So, the vibrating equipment was developed three voltage smooth vibration frequency. Aesthetic design elements of the garments were inspired from the inspiration “Cyrae Nigricans” Sea Slug and considering the novel trends of fashion.

CONCLUSIONS

Sedentary posture within the work environment for longer hours has become a major reason for the back pain of working women of Sri Lanka. Through this project it was approached to give a solution to this issue through the field of fashion and product development. Based on a comprehensive research vibration therapy incorporated wearable collection was designed to relieve and heal the back pain considering the lower back, upper back and neck area of the human body. Time was a limitation in developing this project and some further developments could be done if not. As being one of the most initial studies of this nature in this context this design-based research can provide insights and directions for further improvements. And also, present research as a foundation, it is recommended for

subsequent and potential researchers to further explore the subject area.

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SUSTAINABLE READY TO WEAR COLLECTION FROM GARMENT WASTE FOR GENERATION Z

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ABSTRACT

Clothing is one of the good reasons to differentiate human beings from other animals. Therefore, fashion designers and the industry practitioners are having a responsibility and challenge to not to damage the global environment. The clothing that belongs to us is now converted into a creative value-added product by Re-cycling to find out a solution for the textile waste in the industry. In order to enhance this requirement, the researcher introduced Ready to Wear Collection using Industrial Cutpieces for the Winter Season which is targeted at the Gender-Neutral Customer Segment (Generation-z) in UK market under Stela McCartney brand. Zero waste concept enriched the collection and boro textile technique used to minimize the fabric waste by inspiring from the green living sustainable homes. With the Global Pandemic beginning in 2019, we lost the track of fashion trends worldwide. Therefore, researcher addressed for the textile waste problem and fulfilling the responsibility to revive the lost or missed fashions by regenerating a new trend with a new message.

Keywords – Sustainable fashion, zero waste, Generation Z

INTRODUCTION

The fashion industry is a 1.3 trillion-dollar worldwide sector that employs over 300 million people and is a major economic force and driver of global GDP. This industry competes in a cutthroat

market dominated by global corporations with renounced brands. In the context of fashion, the term "sustainability" most commonly refers to the environmental implications of garment creation (raw material creation, processing, and fabrication), use and care (usage), and disposal (end of use). When clothing is worn out, it reaches its end-of-life (EOL) and pollutes the environment. In 2020, Sustainable Fashion and Gender-Neutral Fashion gained a lot of traction, and the most exciting feature of today's age is how it allows you to choose garments that just fit your personality. Today's looser fits and genderless pieces communicate volumes, and they say a lot. The collapse and restructuring of what it means to be "masculine" vs "feminine" and "male" vs "female" may be the most visible. According to this, three main gender-neutral trends can identify. They are Redefine Size, Print it UP, and The Colour Pink. The launch of labels like "Gucci MX," Converse's genderless line Shape, and Beyonce's Ivy Park x Adidas collaboration of gender-neutral pieces, to mention a few, shows that both start-ups and established companies have been paying attention. The number of new unisex products available online has more than doubled in the last year, according to Fashion United. Gender-neutral clothing promotes not only one's flexible identity, but also environmentally friendly practices such as producing fewer items and keeping them in use for longer. With the environment-friendly sustainable

fashion, fashion design has a challenge not to damage the global environment. In the context of fashion, the term "sustainability" most commonly refers to the environmental implications of garment manufacturing (raw material creation, processing, and fabrication), use and care (usage), and disposal (end of use). When considering about clothing waste in the industry there are four main wastes. They are Consumer Use Waste, Post-consumer textile waste, Pre-consumer textiles waste, and Industrial textile waste. Popular parts of sustainable fashion can categorize as below.

Ethical Fashion: Production, working conditions, fair-trade

Slow Fashion: Sharing, Renting

Circular Fashion: Recycling, Upcycling, Thrifting

Conscious Fashion: Eco-friendly, green fashion

A famous fashion brand Stella McCartney also using four strategies based on sustainable fashion. They are Respect for Nature, Respect for People, Respect for Animals, and Circular Solutions. By considering different work done in the past related to gender neutral sustainable fashion, this research gave an aesthetic and fresh solution for garment waste for generation Z using different technique.

METHODOLOGY

The scope of the research focused on the "Zero Waste Futuristic Collection for the

Autumn Winter Season in Stella McCartney brand". It is introducing as a new arrival of MAKE IT WEARABLE by STELLA McCartney for the UK market. The selected customer segment is to the age group of 25- 35 (Generation-Z) young men and women in the UK market who love to be fashionable while being sustainable. Generation Z – is very radical and ready to accept new changes. The designs of the collection are Gender Neutral and sustainable which giving a solution for the challenge of not to damage for the environment. Accordingly, the collection for the gender-neutral Generation Z expect to communicate world need of ethical fashion and the awful damage that have caused by the irresponsibility of the mankind. The cut pieces as garment manufacturing waste helped to improve the collection which make use of the Boro-Textile concept. Boro is the end result of generations of repetitious Sashiko stitching. Since the green living is the next trend in the world the inspiration for this collection is sustainable homes.

RESULT

Every year, 350,000 tons of worn but still useable clothing, worth roughly £140 million, is dumped in the UK. 95% of landfills, 70% of world use 2nd hand clothing could be recycled. The fabric Off-cuts easily can be re-cycled and brought to a new fashion trend.

Table 1: Data Analysis of youth bought secondhand by Consumption

Description	Consumption as a percentage
• UK re-use	14
• Overseas re-use	34
• Recycling	14

In the UK market, there is seasonal growth every year and the drop were during the pandemic. But the UK market has a constant growth. Therefore, under Stella McCartney, Gender Neutral Fashion collection with Boro Japanese textile technique introduced to the UK market.

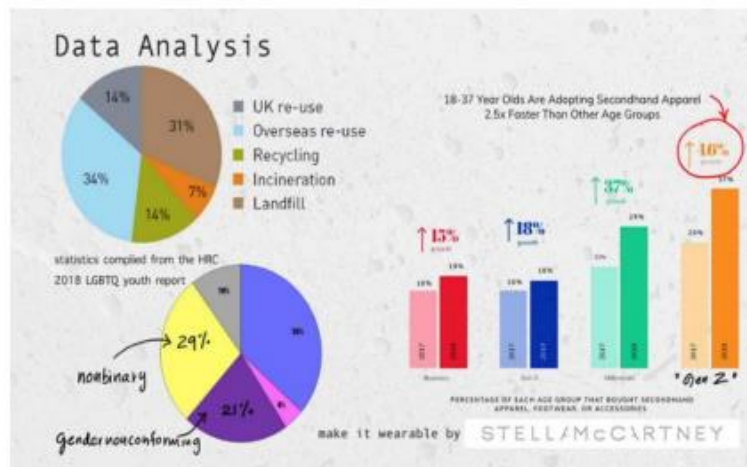


Figure 1: Data Analysis of youth bought secondhand

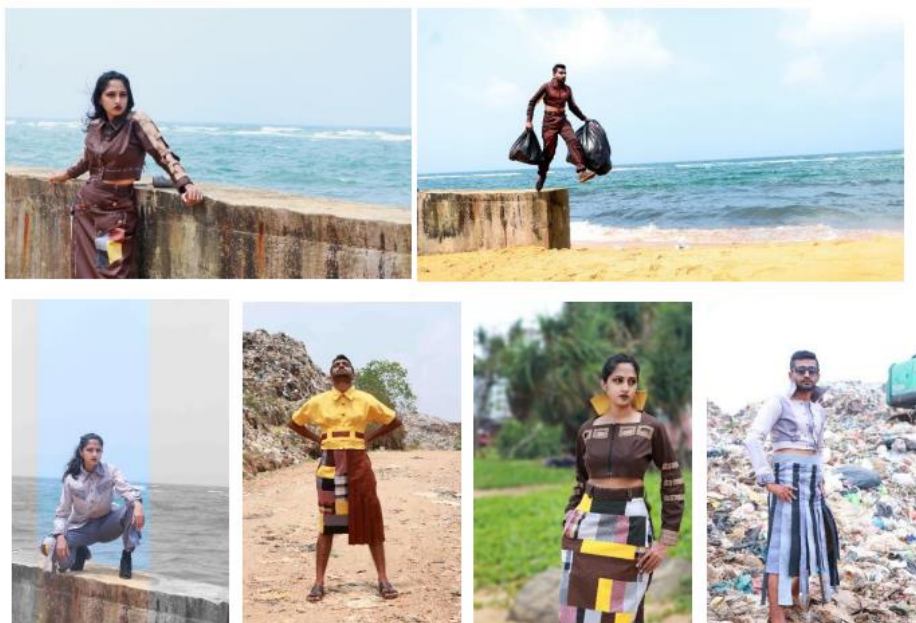


Figure 2: Final fashion collection photoshoot

DISCUSSION

To reduce the textile waste different techniques can be used. Under the selected brand Stella McCartney, the collection used offcuts and cut-pieces to give solution for this problem with aesthetic manner. Inspired from Green Living and Boro Textile Techniques are used to focus on minimizing waste. The concept of Zero waste is not only a timely concept and it used to develop this collection. It is an important concept when we finding



CONCLUSIONS

The fashion Industry consumes a large number of resources, where a major quantity goes to waste. Cut pieces are one of the areas to re-cycle and reduce this waste and could prevent major environmental pollution. It is our responsibility as individuals to take the maximum effort to minimize the textile waste to protect the mother earth because the fashion industry is the third-largest environmental polluter. Therefore, this collection addressing the requirement of minimize of textile waste with an aesthetic way. Fashion designers and textile manufactures can come up with innovative concepts and projects based on this zero-waste concept and boho textile technique used to focus on minimizing fabric waste. Considering the textile and

solutions for the waste of the world's clothing. Introduced Gender Neutral Fashion collection under Stella McCartney brand focusing the UK market and Generation-Z customer segment giving an attractive solution for the clothing waste in the industry. The main concept of this collection is minimalizing waste which leads to sustainable living. By developing various design ideas it was filtered and narrowed down to develop the final range which giving an aesthetic solution for the garment waste.

the fashion trade fashion designers and industry practitioners can bring the maximum effort to minimize the production waste in every step during the production process.

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YOUTH EMPOWERING STREET STYLE CASUAL WEAR COLLECTION 2022

SUPPORTING FOR GLOBAL CLIMATE STRIKE FOR ENVIRONMENT JUSTICE

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ABSTRACT

This research increases the serious issues about how young generation concerns about the environmental emergency towards earth. According to the market research Brazilian youth struggling with social barriers and they are unable to reach their goals as a youth. Mostly in the case of illegal loggings happening across the country. This collection is youth empowering street style casual wear collection for Generation Z who participating annual music festival Lollapalooza Sao Paulo, Brazil 2022. Collection done by 100% ethical textile printing method collaborating with sustainable fashion. Strategies of the collection concentrate on using ethical printing method and knotting details in garments on sustainable fabric materials to make attractive costumes for the targeted customer segmentation. The collection goes under American Eagle Outfitters brand as they now focus on sustainable fashion and AEO main customer groups are the youth market as their outfits are affordable for them and targets the age group between 16-25 represents Generation Z. Collection views clothing lines as a method of storytelling, making people more conscious about climate emergency towards us because the researcher believes the present action matters to the future.

Keywords - Climate change, Ethical printing, Sustainable fashion

INTRODUCTION

Global warming is a long-term disaster causing heating of Earth's climate system. According to reports from NASA atmosphere conditions change due to human activities such as fossil fuel burning, deforestation, increasing of greenhouse gases. However, the rainforest helps to sequester and store carbon while absorbing 2 billion tons of carbon dioxide to stabilize the climate system. But people are no longer taking any action to protect the rainforest which helps human lives survive themselves. As the most recent incident that happened to the ecosystem was Amazon fire (August 2019) that can be mentioned as a huge breakdown of ecosystems of the world and huge collapse to the future of the earth. Amazon is the world's largest rainforest which has rich biodiversity. Nowadays, Amazon rainforest emits more carbon than absorbing and that it is perilously close to a tipping point beyond which it cannot recover. According to the top 10 primary forest loss records for 2020, Brazil is number one in the ranks. As the world's largest rainforest and covering much of northwestern Brazil, their government did not pay significant consideration regarding the Amazon fire. Brazil president Jair Bolsonaro allowing the rate of deforestation to soar to a 12-year high. However, Brazilian young people stand their voices for Global Climate Strike while not being silenced anymore. They were joined by the global climate strike just after the cruel deforestation that has happened to the largest rainforest in the

world. Brazil Government, inattention on this issue for years and they failed to rescue the Amazon from deforestation. They highlighted problems happening across their country such as burning forests; people were dying and always suffering. There were 48 protests scheduled in Brazil. Therefore, they refuse unethical social performances trying to process their lives with organic and sustainable habits while achieving social responsibility on the environment. Global trend forecasters introduce sustainability trends, eco responsibility, climate change & resource security, demographic, and social change such trends shows that social change towards climate safe and security of environment. This can be accomplished with sustainable performance. Sustainability consists of 3 main areas. Such as, Planet: environment performance, people: social performances, profit: economic performances. Sustainability can be achieved through social performances as examples: sustainable lifestyle habits, sustainable events, eco fashion, upcycling, reduce & reuse. Global climate strike also an environment sustainable focused activity which achieving the same objective. These include social progress and equality, environmental protection, conservation of natural resources and stable economic growth. Everybody has the right to a healthy, clean, and safe environment to live. Sustainable fashion is bringing towards the fashion industry and the process of fashion to ecological integrity and social justice. It concerns more than addressing fashion textiles or products. Climate strike is a global strike against climate change and environment violence. This was held by students across the world in Western Europe, from the US to Brazil and Chile and from Australia to Iran, India, Sri Lanka, and Japan. The cause of the strike is political inaction in the context of global warming to achieve the goal of climate change mitigation. This event

pioneered by youth activist Swedish girl Grata Thunberg. She is 19yr old environmental activist who challenging world leaders about the climate emergency towards us and to take immediate actions for climate changes. This is an international movement of school children who take time off from their class and strike against climate change. The movement's purpose is to put moral pressure on policymakers, get them to listen to scientists, and then take decisive action to minimize global warming. they strike because they care about the environment and each other. they have faith in humanity's ability to adapt, avert the worst climatic disasters, and create a better future. The reason behind this crisis is people want to increase their powers in every way they can. As an example, when world powerful parties trying to obtain their wealth and power, increase their boundaries. they don't care about the violence that has happened to the ecosystems. This project raises the serious issues about how young generation concerns about the environmental emergency towards earth. According to the market research Brazilian youth struggling with social barriers and they are unable to reach their goals as a youth. Mostly in the case of illegal loggings happening across the country. Therefore, youth must be encouraged to fight for their rights to save their future in earth. To handle this crisis by turning into sustainable lifestyle and aware the society with developing clear idea about accepting sustainable performances. Lollapalooza, one of the world's largest music festivals, for its environmental and educational outreach programs. The event maintaining and managing the procedure of the event in a particular concern for environment, economic and social issues. Lollapalooza a music festival adds sustainability to the lineup. This festival ensures that a lollapalooza is an eco-friendly event and perform in sustainable. This collection is

youth empowering street style casual wear collection for Generation Z who participating annual music festival Lollapalooza Sao Paulo, Brazil 2022. This collection done by 100% ethical textile printing method collaborating with sustainable fashion. Designs of the collection concentrate on using ethical printing method and knotting details in garments on sustainable fabric materials to make attractive costumes for the targeted customer segmentation. The collection goes under American Eagle Outfitters brand as they now focus on sustainable fashion with the concept of “Treat our breath”. Brand’s main customer groups are the youth market as their outfits are affordable for them and targets the age group between 16-25 represents Generation Z. Collection views clothing lines as a method of storytelling, making people more conscious about climate emergency towards us because the researcher believes the present action matters to the future.

METHODOLOGY

The researcher addressed a serious issue about the environmental emergency towards earth. The introduced sustainable

fashion collection under American Eagle brand giving a strong message to the people who are more conscious about climate emergency. 100% ethical textile printing method enriched the concept of “Treat our breath” which was inspired by the importance of treating the breathable air and sustainable fabrics used to attract targeted customer segmentation which is Generation Z. This youth empowering street style casual wear collection designed to express their feelings for saving this earth by representing their selves as an environment warrior and to express their feelings to the society for save the ecosystem and keep present natural benefits remain the same for future.

RESULT

To address the problem of climate strike, youth empowering street style casual wear collection introduced with 100% ethical textile print methods with sustainable fabrics. The result of this collection is to make people aware of saving the planet earth for upcoming generation and ensure the present natural benefits remain the same for future generations.



Figure 1: Final Range Developments with ethical prints

DISCUSSION

The goal of the research is empower generation Z to express their feelings to the society for save the ecosystem and keep present natural benefits remain the same for future. So that the experiments were performed with identifying sustainable concepts. The data analyzed from different point of view on sustainable fashion and climate change awareness through a sustainable performing event. The significant research was based on the concept of “Treat our breath”. It was inspired by the importance of treating the breathable air which is given by natural resources and protecting them for the future. The young generation is the important population who suffers from social injustice nowadays. They are unable to reach their rights so have a better future on earth is one of the rights they are fighting to achieve by this climate strike. The collection introducing sustainable fashion trend to express their feelings for saving this earth by representing their selves as an environment warrior. The collection inspired by a sculpture “Children’s of the Earth” artwork by Brazilian artist Ernesto Neto, he made the artwork to reveal the idea of interconnection between humans and nature. Inspiring from the details derived the idea to make the textile printing as a surface decoration in the garment collection.

CONCLUSIONS

The youth empowering street style casual wear collection for Generation Z who participating annual music festival Lollapalooza Sao Paulo, Brazil 2022 done by 100% ethical textile printing method collaborating with sustainable fashion. The researcher concentrates on using ethical printing method and knotting details in garments on sustainable fabric

materials to make attractive costumes for the lollapalooza festival. The collection goes under American Eagle Outfitters brand as they now focus on sustainable fashion and AEO main customer groups are the youth market as their outfits are affordable for them. Collection targets the age group between 16-25 represents Generation Z. Collection’s clothing lines build up as a method of storytelling, making people more conscious about climate emergency towards us. Because the researcher believes the present action matters to the future.

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**FIBER COLOURED BY THE HERITAGE; AN OCCASIONAL WEAR
COLLECTION USING AYURVEDIC NATURALLY DYED TEXTILES AS A
SOLUTION FOR SKIN CONDITIONS CAUSED BY CHEMICALLY TREATED
TEXTILES**

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ABSTRACT

Modern clothing is often dyed with chemicals; those same compounds have been linked to adverse health effects. Since clothing is in close contact with skin most of the day, it's no surprise that our shirts, pants, and underpants can cause skin problems like contact dermatitis, eczema, allergies and even cancers with the long-time use. These toxic chemicals are often absorbed into the skin, especially when one's body is warm and skin pores have opened to allow perspiration. So, to approach this issue, a modern high end occasional wear collection was created under the concept of "Fiber coloured by the heritage" targeting women between the age of 30 to 45. The target customer was identified by using both primary and secondary research methods as those who live in the urban context of Sri Lanka with a high disposable income who are extroverts, influential and care a lot about health, appearance and most importantly "Ayurveda" and sustainability. Further, the research results show that there is a requirement for alternative dyeing methods for garments which are healthy and sustainable. In the project, a natural dyeing method based on eco printing/contact printing: a form of natural dyeing where the colours and shapes from plant material are transferred to a fabric via steaming or boiling was used as a solution for the identified issue. The process of natural dyeing is expensive,

labour intensive and time consuming yet a better initiative in developing healthy and sustainable garments for the betterment of humankind.

Keywords: Natural dyeing, Eco printing, Sustainability

INTRODUCTION

Nowadays people mostly talk about global warming, water/air/land pollution, eco-friendliness, sustainability, recycling; all causes earth to go into its doomsday and concepts to prevent them. All these awareness is to save earth for the next generations. But most of them have forgotten the health issues that cause the short life cycle of humans. Textile and fashion have a significant influence in creating health issues that affect the human life cycle. Clothing comes into prolonged contact with one's skin, the largest organ, and so toxic chemicals which are contained in the fabrics are often absorbed into the skin. This absorption of toxic chemicals has been a main cause of significant health effects like allergies, eczema, dermatitis and even cancers with long time use. These toxic chemicals include carcinogens, hormone disruptors, AZO dyes, Solvents, surfactants, phthalates, metals etc. Economically it is hard to ban these toxic chemicals that are used for fabrics and garments. Some research has been carried out worldwide

on natural dyeing methods as a substitute for toxic chemical dyeing of fabrics. (Tripathi, Yadav, & Padhyay, 2015) have discussed the importance of commercializing the natural dyeing process for the betterment of humans and the environment. It is important to select proper natural mordants and extraction with the proper applications of technology to make natural dyeing commercial (Prabhu & Bhute, 2012). According to (Alemayehu, 2014) natural dyes create very sophisticated and subdued shades compared to synthetic dyes and he has done studies on scientific techniques and procedures to create selective natural dyes. Many studies have been conducted on natural dyes based on their characterization, chemical analysis, extraction methods, mordanting methods, dyeing process variables, etc. But very limited studies were carried out on aesthetic properties and approaches on natural dyeing methods of fabrics and garments. In Sri Lankan context there are only very limited practice-based researches carried out on natural dyeing process and aesthetic approaches. And no significant study was carried out on natural dyeing and surface design development. So, this design-based research will add value to the fashion body of knowledge and will provide more and further research ideas on natural dyeing and natural surface design development methods.

METHODOLOGY

Allergic reactions or dermatological problems due to different types of clothing is a common concern. However, many may misdiagnose their skin problems and will not understand that the cause can actually be found in their clothes. Many toxic dyes which are included in garments, fabrics are water-soluble; sweat from the body can have the same effect, which leads to leaching out of the dye and

increasing the risk of developing critical skin conditions. The natural dyes cannot create exact similar colours to those made synthetically, but the benefits to health and the environment allow them to be a far better choice as they have a carbon-neutral footprint. So, this research is about finding an alternative healthy way of dyeing clothes, especially textile surface design development.

Multiple researches were carried out within the project to get an approach to the final outcome. Customer research was carried out using both primary and secondary methods to identify the specific needs and requirements to cater through the project. A wellstructured questionnaire in the form of a survey was adhered to. Fabric research was carried out to identify the best possible fabrics for the natural dyeing process. The dyeing process was carried out in three stages: extraction of dye from the plant source, mordanting and dyeing. Then experimented on different moderating agents, and colour fixing agents and pretreated them to seek the best possible option for the natural dyeing process. Further different experiments were conducted for the maximum extraction of natural dye from the plant sources. Since the technique of contact printing /eco printing is novel to Sri Lanka comprehensive study was carried out using both primary and secondary resources. For thousands of years, people have been making their own dyes to colour yarn, fleece, clothing and household textiles. Carpet weavers throughout Turkey still use natural dyes to colour the wool spun into yarn and hand woven into the brilliantly patterned carpets that can be seen all over the world (Söylemezoğlu, 2006). In Sri Lankan culture Buddhist monks also use natural ways of dyeing their robes by using different tree leaves, roots, stems etc. Also, Sri Lankans have their own Ayurveda medical system. All the medicines used in Ayurvedic treatments are natural ingredients. Since

ancient times, they have used natural ingredients in beauty & cosmetic products. Therefore, it is obvious that using natural dyestuffs is a safe substitute for chemical dyestuff. In Sri Lanka people have less awareness about natural dyeing and its importance. So, it is important to introduce the concept of “Ayurvastra” healthy clothing.

A modern high end occasional wear collection was created under the concept of “Fiber coloured by the heritage” using natural dyeing process, specifically contact printing/eco printing as a surface design development; alternative to synthetic toxic dyes targeting women between the age of 30 to 45 who are in urban context of Sri Lanka.

RESULT

The following shows the final outcome of the design-based research.



Figure 1 Final Collection

DISCUSSION

Not all fabric can be easily dyed with natural materials. The best ones to use are those made from natural materials themselves. Cotton, silk, wool, and linen

absorb the dye best. Cotton is sturdy enough to withstand heat for a few hours, and retains the soft and fluffy feel holding dye well. Due to its absorbent nature, cotton holds dye very easily and can be made into a wide variety of colours &

breathable than synthetic fibres. Anyway, protein fibres are much easier to dye than cellulose fibres ex: Silk. Different experimentations were carried out on various moderating agents, and colour fixing agents and pretreated them to seek the best possible option for the natural dying process. Soy milk mordant and alum mordant gave the best results. Alum in Sinhala Ayurveda is known as “Seenakkaram” and non-toxic. Alum is faster in getting the required result while soy milk takes weeks to get the result. Soy milk works as a binder rather than a mordant. Further not all dyes need mordants to fix dye to the fabrics. Some dyes are able to fix the fabric strongly. The method which is discussed in this project can be suitable and convenient for the Sri Lankan market yet may not be suitable for contexts with different climates, humidity, temperature and so on. Natural dyes could fade when exposed to the sunlight specifically, the way of storage and exposure decide the durability of the naturally dyed clothes.

CONCLUSIONS

“Ayurveda” is an ancient medical treatise, summarizing the art of healing and prolonging life and is practiced in Sri Lanka for more than 5,000 years. It is regarded as an alternative form of medicine. Now the same “Ayurveda” is brought into “Ayurveda”, the medical dress. Its production does not add up to environmental pollution. It is now being used extensively for the treatment of a wide range of diseases such as diabetes, skin infections like eczema, body acne, hypertension, asthma, arthritis, rheumatism, etc. With people becoming more health-conscious all over the world, ‘Ayurveda’ fabrics have great scope in times to come. “Ayurveda” not only reinforces the importance of sustaining the

planet for future generations but also considers the well-being of current generations using age-old practices. “Ayurveda” can play an effective role in the revival and elevation of the market for eco-friendly fabrics. Thus, it may be taken as an emerging or new area of entrepreneurship and job opportunity for young people on the one hand and on the other contributes towards offering economic stability to the nation.

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A STUDY ON THE PREVALENCE OF EATING DISORDERS AMONG NATIONAL LEVEL FEMALE BOXING PLAYERS IN SRI LANKA

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ABSTRACT

According to the Diagnostic and Statistical Manual of Mental and Behavioral Disorders (DSM IV) eating disorders include Anorexia Nervosa (AN), Bulimia Nervosa (BN) and Eating Disorders Not Otherwise Specified (EDNOS). Athletes who take part in weight category sports often feel pressure to lose weight rapidly and they follow abnormal eating patterns to reduce their weight. Therefore, this study examined the prevalence of eating disorders among national level female boxing players. Subjects included were forty-five national level female boxing players in Sri Lanka, aged between 18 to 32 years. All the players were administered SCOFF questionnaire for screening and Eating Attitude Test (EAT- 26) to classify individuals at risk for eating disorders. Further female Athlete Screening Tool (FAST) questionnaire was used to identify the player's eating behaviors, physical activity level and personal beliefs regarding their eating habits. Body Mass Index (BMI) was taken as an anthropometric parameter of the players. Chi squared was used to find the relationship between eating disorders and the value of BMI. Results of SCOFF questionnaire showed > 2 marks by 53.34% and were screened as at risk. According to EAT- 26 and DSM VI criteria, 53.34% were found at risk and 46.66% were not. Among the risk players, 95.84% were Anorexia Nervosa 4.16% were Bulimia Nervosa. Considering the BMI level 26.66% players were within normal limit and 73.34% players were in the underweight, overweight and obese categories. Chi squared test results shows that there was a significant relationship between eating disorders and the value of BMI ($p < 0.05$). This study revealed that there was high prevalence of eating disorders among national level female boxing players and it is important to each national level sports team should have the access to the service of a qualified nutritionist / dietitian to get dietary advices for minimize the risk of eating disorders.

Key Words: Eating Disorders, Female Boxing Players, SCOFF

DETERMINATION OF THE ANTIBACTERIAL ACTIVITY OF AZADIRACHTA INDICA (NEEM) ON ESCHERICHIA COLI AND STAPHYLOCOCCUS AUREUS

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ABSTRACT

Bacteria are small unicellular organisms and can be found abundant in the world. Antibiotic resistance is caused when bacteria change the way they respond to the medicines. “Kohomba” or “Neem” leaves are considered antibacterial and fungicidal medicine that is widely used within Sri Lanka. Many parts of the Neem tree including the leaves, bark, fruit and flowers are used to cure various diseases. The main objective of this study was to determine the antibacterial activity of Azadirachta indica (Neem), on Escherichia coli and Staphylococcus aureus strains. Solvent extraction, Soxhlet extraction, Maceration, Supercritical fluid extraction and Microwave-assisted extraction are commonly used for Neem extraction. This study employed the solvent extraction method using three solvents: water, ethanol and hexane. The solvent extraction method was used as it is inexpensive, can collect pure extract, can produce large extract and is easy to use with less effort. The disc diffusion method was done to determine the antibiotic susceptibility of the plant extract. All three Neem leaf samples showed not susceptible to both bacteria as they showed no inhibition zones. This could be due to the extraction method or temperature, but the literature has shown strong evidence of antibacterial properties in Neem.

Keywords: Azadirachta indica (Neem), Solvent extraction, Escherichia coli, Staphylococcus aureus

ANTIMICROBIAL ACTIVITY OF FUNGAL CRUDE EXTRACTS FROM GENUS SONNERATIA IN NEGOMBO LAGOON, SRI LANKA

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ABSTRACT

Endophytic fungi play a key role in plant defense by secreting antimicrobial agents. The Sonneratiaceae family possesses many medicinal properties. *Sonneratia alba* (Yak Kirila) and *Sonneratia caseolaris* (Kirila) are found along the coast of the Negombo Lagoon, Sri Lanka. Endophytic fungi from the bark and leaf of these two different mangrove species were successfully isolated. Fungal colonies were identified based on colony morphology after they were grown on Potato Dextrose Agar medium. A total of three fungal strains *Penicillium Viticola*, *Aspergillus Niger* and *Aspergillus Alternaria* were identified from the leaf and bark. Antibacterial properties of *S. alba* and *S. caseolaris* bark and leaf extracts were screened against gram-positive and gram-negative bacterial strains, *Staphylococcus aureus* and *Escherichia coli* using well diffusion method. After the incubation period, the minimum inhibition zone was measured, and confirmation was carried out with minimal inhibitory concentration (MIC) and minimum bacterial concentration (MBC) methods. Mangrove species of *S. Caseolaris* and *S. alba* showed antimicrobial properties against *S. aureus* and *E. coli*. According to the observations, *Aspergillus Niger* has shown high inhibitory activity (15 mm) against *S. aureus*, whereas *Aspergillus Altenaria* showed the lowest inhibitory activity (10 mm) against *Escherichia Coli*. The study provides evidence that both *S. alba* and *S. caseolaris* barks and leaves as potential sources of bioactive compounds with antimicrobial properties.

Keywords: mangroves, antimicrobial activity, *Sonneratia alba*, *Sonneratia caseolaris*

A QUESTIONNAIRE BASED SURVEY WITH PHYSICIANS FOR EFFECTIVENESS AND TOLERABILITY OF SECNIDAZOLE IN PERIODONTITIS AT SRI LANKA

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ABSTRACT

Background: Periodontitis is a chronic inflammatory disease affecting supportive gingival tissue. Since most of periodontal infections causes orofacial infections, the prescribing of antimicrobials by physician has become important in dental practice. Antimicrobials are the mainstay of the treatment of periodontitis. Objective: To conduct questionnaire-based survey among physicians in Sri Lanka for the effectiveness and tolerability of Secnidazole in periodontitis. Materials and Methods: A prospective observational study conducted for six months with physicians based at Sri Lanka. A questionnaire was prepared in consultation with key opinion leaders, including ten questions which focused on effectiveness and tolerability of 2gm Secnidazole in patients with periodontitis. Physicians voluntary consent was taken in person for their participation in the survey. Results: A total of forty-one responses were received from physicians, it was observed that 90.2% physicians prescribed antibacterial followed by antiprotozoal in dental infections. Most common symptom for the prescription of Secnidazole was periodontal pus 53.7% accompanied by inflammatory symptoms 46.3%, and bleeding gums. Secnidazole 2gm single dose was preferred by 87.8% physicians for its convenient dosing over the metronidazole, tinidazole and ornidazole. Physicians found Secnidazole was good to excellent for effectiveness in 97.6% and tolerability in 97.6% for periodontitis. Conclusion: Secnidazole 2gm single dose was found effective and tolerable in the treatment of periodontitis. It is preferred over the other nitroimidazole drugs like metronidazole, tinidazole and ornidazole for its convenient dosing. From the survey it is observed that, physicians were in favor of Secnidazole for treatment of periodontitis.

Keywords: Secnidazole, Periodontitis, Survey, Effectiveness, Tolerability

SITE-SPECIFIC DOCKING AGAINST HIV- RT PROTEIN USING AUTODOCK

4.2.6

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ABSTRACT

HIV is one of the most austere and deadly infectious viruses with disastrous concerns. Moreover, it is a significant global public health concern with rising rates of morbidity and mortality despite antiretroviral medication availability. However, the majority of anti-HIV-1 medications specifically target reverse transcriptase (RT) to prevent the synthesis of cDNA and the subsequent chain of events that lead to retroviral replication. In this study, site-specific protein-ligand docking was performed in virtual box 6.1 using Autodock 4.2.6 to determine phytochemicals that can target the HIV-RT protein (PDB ID:1REV). A clinical trial drug (delavirdine) was provided as the standard, and 25 phytochemicals were chosen. Furthermore, the genetic algorithm runs were set to 150 and when the docking grid box was generated the x, y, and z values were 11.96, -21.505, and 25.36. BIOVIA DS and chimera were used to determine the docking poses and interactions. Effective phytochemicals were analyzed based on binding energy (BE) and inhibition constant (Ki), lupeol (BE: -11.15 kcal/mol, Ki:6.67nM), masllic acid (BE: -11.15 kcal/mol, Ki:6.71nM), withaferin A (BE: -11.15 kcal/mol, Ki:6.70nM) and lupatic acid (BE: -10.59kcal/mol, Ki:17.20nM) respectively. Redocking (0.000Å) was conducted to validate the docking protocol. The common amino acid interactions were observed in LYS 101, LEU 100 and PRO 95 using BIOVIA. Lupeol disported the most effective phytochemical for treating HIV-1 during the ADMET lab 2.0. Lupeol is expected to have a good bioavailability because of its high cell permeability, absorption of Caco2 and compliance with the Lipinski rule.

Keywords: HIV– reverse transcriptase, 1REV, phytochemicals

PREVENTION OF OSTEOPOROSIS THROUGH AYURVEDA

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ABSTRACT

Osteoporosis is a 'silent disease', which related fractures or degenerative changes of bones may results in weaken bones to the points where they break easily and leads to bed ridden or sorrowful death. The disease is characterized by low bone mass, deterioration of bone tissue, disruption of bone microarchitecture and big spaces in the bone structure. According to Ayurveda Asthi dhathu is responsible for this condition. The formation and nutrition available to each tissue to form its components in a regular and healthy way depends on how best the previous tissue is nourished from the essence of nutrition provided from the gut. Ayurveda recommends holistic treatment for osteoporosis which involves avoiding factors that lead to the vitiation of vata dosha that ultimately lead to worsening of the condition. Antartparimarjana (Oral internalmedicine) Bahirparimarjana (External therapeutic methods) ,Shodana (Purification), rejuvenate treatments and palliative treatments can do for prevention as well as cure the disease according to Ayurveda samhitas. Basti Karma is the introduction of liquid-based Ayurvedic medication, such as herbal oils or decoctions, through the patient's colon. This balances out the vata dosha, which is predominantly located in the colon and bones. In this manner, there are some specific basti therapies which enable bone strength. For instance, Nirhua basti and Anuvāsana basti provide such benefits. Similarly, treatments such as Abhyāṅga, pichu, Kati Basti and dhara karma can increase the strength and range of body joint movements. Additionally, Ayurveda recommends a combination of healthy diet (pathyaahar) and lifestyle changes (pathyavihar), yoga vyayama and meditation in order to manage osteoporosis effectively.

Key words: Asthi dhathu, Antartparimarjana chikithsa, Bahirparimarjana chikithsa,Vasti karma

IDENTIFICATION OF E. COLI IN DRINKING WATER SOURCES AROUND BADULLA MUNICIPAL COUNCIL AREA AND DETECTION OF ANTIBIOTIC RESISTANCE GENES

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ABSTRACT

At present, drinking water contamination with pathogenic bacteria through waste products such as human and animal feces has become a major issue in the world. *Escherichia coli* (*E. coli*) bacterial species plays a key role as a fecal contamination indicator, which has both harmful and harmless acts towards human. Harmless strains produce vitamin K2 inside the gut, while harmful strains cause diarrhea and even Uterine Tract Infections (UTI). More importantly, some of the strains develop resistance for antibiotics due to prolong exposure. Specially, gut residing *E. coli* strains. Then treatment with common antibiotics become hopeless and that has threatened the health care globally. It is possible for other pathogenic bacteria including *E. coli* species to acquire these antibiotic resistance genes through horizontal gene transfer. Currently, non-clinical environments such as common aquatic resources have been recognized as a significant factor in dissemination of antibiotic resistance genes. In this study, water samples were collected from the water sources around Badulla Municipal Council, UVA province, Sri Lanka. At the first stage both biochemical and molecular analysis were performed to detect *E. coli*. Followed by, Antibiotic Susceptibility Testing (ABST) for the most probable *E. coli* samples to observe their antibiotic resistance against Tetracycline, Sulfonamide and Gentamicin. The tetracycline resistance strains were tested for the presence of Tet A and Tet C resistance genes by Polymerase Chain Reaction (PCR). Tet A gene was detected in five drinking water samples including common wells and a domestic tank.

Keywords: Drinking water, *E. coli*, Antibiotic Susceptibility Testing, Antibiotic resistance, Polymerase Chain Reaction (PCR), Tet A gene

DETERMINATION OF ANTIBACTERIAL ACTIVITY OF GINGER (ZINGIBER OFFICINALE) EXTRACT AGAINST ESCHERICHIA COLI AND STAPHYLOCOCCUS AUREUS

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ABSTRACT

The discovery of new antibiotics and semi-synthetic derivatives are the major global concern due to rise of antibiotic resistance to drug resistant pathogens that have acquired resistance mechanisms. Natural bioactive components from medicinal plants show antibacterial effect on bacteria. Rhizome of the *Zingiber officinale* (ginger) is on the most widely consumed natural product worldwide. The extracts of *Zingiber officinale* were obtained using maceration method using 50% ethanol and distilled water. The ginger extracts subjected to antibacterial activity against *Escherichia coli* and *Staphylococcus aureus* by disk diffusion method. The results showed significant antibacterial activity against *Staphylococcus aureus* compared to *Escherichia coli* with 50% ethanol extract whereas the distilled water extract greater inhibitory effect on *Escherichia coli* than on *Staphylococcus aureus*. This study indicated that the *Zingiber officinale* extracts have potential antibacterial effect against the two bacterial strains. *Zingiber officinale* could be studied for bioactive components and introduced as antibiotic medication for inhibiting bacterial development and as a potential replacement for synthetic bactericides.

Keywords: *Zingiber officinale*, Ginger extracts, Antibacterial activity, *Escherichia coli*, *Staphylococcus aureus*

EFFECTIVENESS AND TOLERABILITY OF SECNIDAZOLE IN TREATMENT OF PROTOZOAL INFECTIONS: A QUESTIONNAIRE-BASED SURVEY IN SRI LANKA

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ABSTRACT

Background: Protozoan infections are health concern in tropical country like Sri Lanka. It contributes significantly to morbidity and mortality. Objectives: To evaluate use of single dose of secnidazole 2gm among the physicians for effectiveness and tolerability in protozoal infections. Materials and methods: A prospective, observational, cross-sectional study conducted in Sri Lanka for six months with general physician, obstetrician and gynecologist. A well-defined questionnaire was prepared based on clinical symptoms, effectiveness, tolerability, and resistance pattern. Physician's consent was obtained. Results: In survey 98.25% were general practitioners, followed by obstetrician-gynecologist. In their practice 94.7% physicians prescribed anti-bacterial. All physician prescribed secnidazole for amoebiasis, giardiasis, trichomoniasis and bacterial vaginosis. Secnidazole was prescribed by physicians for symptoms like vaginal pain (64.9%), diarrhea (54.4%), vaginal discharge (35.1%) and abdominal cramps (35.1%). Secnidazole was prescribed most commonly in 93.0% adults. Physicians preferred 2gm secnidazole over metronidazole in amoebiasis (86%), trichomoniasis (31.6%) and giardiasis (24.6%) due to effectiveness (91.2%) accompanied by tolerability (26.3%), less complication (29.8%) and cost effective (22.8%). Secnidazole was preferred over paromomycin in amebiasis (57.9%) and giardiasis (40.4%) due to effectiveness (91.2%) followed by less complications (19.3%), tolerability (5.3%) and cost effective. In metronidazole resistant amoebiasis, (82.5%) Physicians preferred secnidazole. Secnidazole was good to excellent in efficacy (86%) as well as in tolerability in amoebiasis, giardiasis, trichomoniasis and bacterial vaginosis. Conclusions: Single dose secnidazole 2gm was effective and tolerable in various protozoal infections. It is preferred over metronidazole and paromomycin due to better efficacy and tolerability. Secnidazole could be the alternative option for treatment of various protozoal infections.

Keyword: Secnidazole, Protozoal, Survey, Effectiveness, Tolerability

SITE SPECIFIC DOCKING FOR THE IDENTIFICATION OF EFFECTIVE PHYTOCHEMICALS AND THEIR BINDING SITES AGAINST SARS-COV-2

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ABSTRACT

Coronavirus disease 2019 (COVID-19), induced SARS-CoV-2, has produced an unparalleled global health emergency and continues to endanger society. Across the last two years, scientists from all over the world have worked tirelessly to improve our understanding of coronavirus biology. Alternative solutions are clearly needed since medication refinement and vaccination advancement necessitate significant time commitments. Based on the computer compatibility (Processor: 11th Gen Intel(R) Core (TM) i5-1135G7 @ 2.40GHz 2.42 GHz), Autodock suite 4.2.6 was utilized for site-specific docking. More importance has been made in recent years on discovering plant-derived chemicals that can be employed as effective therapeutics. Therefore, phytochemicals retrieved from NCBI PubChem were investigated and assessed their potential against the main protease of SARS-CoV-2 (PDB ID: 6LU7) which was downloaded from RCSB PDB. Clofazimine, an FDA authorized drug only for use in treatment of leprosy and a clinical trial drug for Covid-19 was provided as the standard. Best phytochemicals were retrieved centered on their binding energy (BE) and inhibition constant (Ki). BIOVIA Discovery Studio was employed to visualize best docking postures and interactions. Redocking (BE: -10.81 kcal/mol) was performed to validate docking methodology. Consequently, the most promising phytochemicals were identified as Ergosterol peroxide (BE: -10.00, Ki: 47.10), Robustaflavone (BE: -9.81, Ki: 64.21), Campesterol (BE: -9.18, Ki: 187.04), Nelfinavir (BE: -8.93, Ki: 286.28), Rutin (BE: -8.84, Ki: 329.68) and Oleonolic acid (BE: -8.66, Ki: 451.45) kcal/mol and nM respectively. Absorption, distribution, metabolism, excretion, and toxicity (ADMET) properties were also investigated via ADMETlab 2.0. Ergosterol peroxide was picked as the best candidate since it did not violate the Lipinski rule and adhered to ADMET properties.

Key words: Covid-19, Site-specific, Autodock suit 4.2.6, Phytochemicals, ADMETlab 2.0

A NOVEL BLOOD-FEEDING DEVICE IN REARING OF AEDES AEGYPTI FOR TRANSGENIC STUDIES IN SRI LANKA

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ABSTRACT

Dengue is a mosquito-borne viral disease mainly transmitted by *Aedes aegypti*. In the absence of effective drugs or vaccines, the disease control is primarily reliant on mosquito vector control strategies. With the failure of conventional vector control strategies, new strategies involving transgenic mosquitoes are being developed, which specifically require maintenance of mosquito colonies in the laboratories. Blood feeding of mosquitoes is a fundamental part of routine colony maintenance of *Ae. aegypti* since they require blood meal for their egg maturity. Here we report the development of a simplified and cost-effective artificial membrane-feeding device out of affordable materials of disposable plastic cup, Styrofoam and parafilm to facilitate the *Ae. aegypti* artificial blood feeding. The effectiveness of the device was compared with that of a commercially available blood feeding device (Hemotek) by assessing the blood feeding rate, fecundity and hatchability. Similar blood feeding rates were found on both commercially available device and new blood feeding device (94.33 ± 1.59 and 91.83 ± 1.59 respectively; $p > 0.05$) as well as comparable fecundity between two methods (22.03 ± 1.48 and 20.79 ± 0.71 respectively; $p > 0.05$). Furthermore, there was no statistically significant difference in hatchability between the two methods (93.82 ± 1.43 and 91.99 ± 1.36 respectively; $p > 0.05$). The results indicate this simple and efficient blood feeding device can be used for routine colonization of laboratory strains of *Ae. aegypti*.

Keywords: Dengue, *Aedes aegypti*, Mosquito, Blood-feeding

DETERMINATION OF ANTIBACTERIAL ACTIVITY OF ZINGIBER OFFICINALE ON ESCHERICHIA COLI AND STAPHYLOCOCCUS AUREUS

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ABSTRACT

The rapid emergence of antibacterial resistance is a global health threat as bacteria have developed resistance to antibiotics that were previously used to treat pathogenic infections by modifying their metabolic processes, cellular structure, and genetic material. The effectiveness of crude extracts from medicinal plants against drug-resistant bacteria have been studied and proven. Ginger (*Zingiber Officinale*) is a well-known spice and herb used in traditional medicine and food preparation. In this study, *Zingiber Officinale* was shade dried, powdered, and filtered by maceration extraction method to obtain the ginger crude extract, ginger extract diluted in 50% ethanol and ginger extract diluted in distilled water. The disk diffusion method was used to determine the antibacterial activity of the ginger extracts against two different bacterial species which are *Escherichia coli* and *Staphylococcus aureus*. Results exhibited higher antibacterial activity with ginger extract diluted with 50% ethanol compared to the ginger crude extract and ginger extract diluted with distilled water. Moreover, ginger crude extract showed less antibacterial effect than the other two ginger extracts. In comparison to *Escherichia coli*, *Staphylococcus aureus* was ineffective to ginger extracts. From this study, it is clearly observed that the ginger crude extract, ginger extract diluted with 50% ethanol and ginger extract diluted with distilled water have antibacterial activity against *Escherichia coli*. Bioactive compounds in *Zingiber Officinale* could be as a promising platform for designing and developing the antibacterial medicines and also in food preservation.

Keywords: Antibacterial activity, *Zingiber officinale*, *Staphylococcus aureus* and *Escherichia coli*

A REVIEW ON THE POTENTIAL OF HERBAL TEA IN THE MANAGEMENT OF TYPE 2 DIABETES MELLITUS

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ABSTRACT

Diabetes is a metabolic disease that can cause significant morbidity, mortality, and long-term consequences. Available treatment options, which are mostly based on treating hyperglycemia with insulin and other pharmacological agents, are ineffective and can even cause undesired side effects. According to scientific research, bioactive substances from teas and other plant-based foods, which are proven sources of natural antioxidants, may be an appealing option for preferentially treating and managing type 2 diabetes mellitus, and so have major therapeutic implications. The main objective of this review is to investigate the potential of herbal tea in the management of type 2 diabetes mellitus. Sub objective of the study is to find out how effective different types of herbal tea are in the management of type 2 diabetes mellitus. This systematic review aimed to evaluate evidence using keyword search in recognized electronic databases from 2010–2021. Studies were selected for relevance, then reviewed with extracted data for outcome measures. A total of one hundred and thirty-one publications were identified and only eleven studies met the inclusion criteria. All the studies with clinical studies and the participation of type 2 diabetic patients and type 2 diabetic animal models were included. The systematic review will confirm the potential of herbal tea in the management of type 2 diabetes mellitus.

Keywords: Herbal Tea, Type 2 Diabetes, Hyperglycemia

INTRODUCTION

Diabetes mellitus is one of the most prevalent worldwide illnesses that causes major morbidity, mortality, and long-term sequelae, including retinopathy, nephropathy, peripheral damage, and cardiovascular disease (Ajuwon et al., 2018). Insulin non-dependent diabetes mellitus is known as Type 2 Diabetes Mellitus (T2DM), which is characterized by a transient loss of cell mass (β cell) caused by a genetic predisposition (Verma et al., 2018). It occurs primarily in obese people and is linked to high cholesterol and blood pressure levels. The aim of T2DM treatment is to reduce insulin resistance while increasing insulin secretion. Ineffectual and potentially harmful adverse effects might be caused by the available treatments, which are primarily focused on managing hyperglycaemia via the administration of insulin and other pharmacologic medications (Zhang et al., 2019). In recent years, herbal treatments have gained popularity among the general population since they are seen to be effective, devoid of side effects, and complimentary to conventional western medicine.

According to scientific studies, bioactive substances found in herbal teas and other plant-based meals may be an intriguing choice for selectively managing and controlling T2DM (Chandrasekara & Shahidi, 2018). This review investigates the potential of herbal tea in the management of T2DM focusing on how effective different types of herbal tea is in the management of T2DM. Herbal teas are

usually a mixture of multiple ingredients, more accurately known as “tisanes”. Tisanes are combinations of dried leaves, roots, barks, seeds, fruits, nuts, flowers, or other botanical elements that have unique flavors and health benefits (Kabilan et al., 2019). These herbal teas are completely caffeine-free and are not made from any leaves of the *Camellia sinensis* plant. There are many different herbs that can be used for making herbal tea, each with a different use and purpose.

METHODOLOGY

Data extraction was conducted from the electronic bibliographic databases used with keyword searches on PubMed, Medline, ELSVIER, Google scholar, ResearchGate, Hindawi, Sage pub, ScienceDirect, SpringerLink, and AgeLine. Searches were limited to articles published from 2010–2021. The PICO (populations, interventions, comparators, outcomes) method was used as the approach to identify studies that met inclusion and exclusion criteria (National

Collaboration Centre for Methods and Tools, 2017). The population of interest was T2DM patients and animal models.

Exclusion criteria as follows, studies that were not published in English language, studies without full text, studies without clinical studies and studies with duplicates. Studies which uses in vitro techniques were excluded. All the studies with clinical studies and the participation of T2DM patients and animal models were included. Moreover, only published studies were used to maintain quality and transparency. Article titles and abstracts were reviewed for suitability, with the exclusion of duplicates, literature reviews, case studies, and commentaries.

RESULTS

The characteristics of the included studies are summarized in Table 1 according to the potential of herbal tea in the management of T2DM using clinically based research.

Table 01 - Characteristics of the included studies

Source	Approach	Sample size & characteristics	type, & trials	Study location, year	Type of herbal tea	Results
Ajuwon et al., 2018	Animal models	Animal using rats	trials	South Africa 2015	Rooibos	Rooibos extract reduced the increases in fasting blood glucose levels in type 2 diabetic models rats.

Azimi et al, 2016	Clinical study	Human trials 208 patients Aged $\geq$ 30 years	Iran 2013	Cinnamon, cardamom, saffron, ginger	Saffron and ginger consumption reduced soluble intercellular adhesion molecule-1 concentrations, and ginger consumption influenced systolic blood pressure. Cinnamon consumption had an effect on weight, while cardamom and ginger consumption had an effect on waist circumference in patient with T2DM.
Mozaffari-Khosravi et al., (2013)	Clinical study	Human trials 100 patients Aged range 30-60 years	Iran 2013	Sour tea	Study revealed that T2DM individuals who drink three glasses of sour tea daily for 4 weeks show significant decreased diabetes (281.4 ± 38.3 mg/dl in the control group, 341.8 ± 54.8 mg/dl in the tea-treated group).
Rafrat et al., 2015	Clinical study	Human trials 64 patients (32 control) Aged range 30-60 years	Iran 2013	Chamomile tea	Short-term intake of chamomile tea has beneficial effects on glycaemic control and serum lipid profile in T2DM patients. Significantly decreased concentration of HbA1c ($p = 0.03$), serum insulin levels ($p < 0.001$), homeostatic model assessment for insulin resistance ($p < 0.001$).
Kishi et al., 2010	Animal models using oral glucose tolerance tests	Animal trials using 15 rats (9 Male SDT rats, 6 male SD rats)	Japan 2010	Perilla (Shiso) tea	It is possible that habitual shiso tea consumption reduces the incidence of T2DM. Also shiso tea might affect the clearance of glucose from the blood.
Jayawardena et al., 2015	Clinical study	Human trials 51 patients Age range 40-65 years	Sri Lanka 2015	Salacia reticulata (Kothala Himbutu tea)	Kothala Himbutu tea to conventional diabetes treatment produced significant falls in haemoglobin A1C or glycated haemoglobin test (HbA1C) levels ($HbA1C \% = 6.8 \pm S.D. 0.9$).

Mahmoud et al., 2016	Clinical study	Human trials 50 patients	Kuwait 2016	Diabetic Tea	The study found that this tea protects against diabetes complications in the long term. Ingestion of this tea suppressed CD4+ T cell expression of IL-1β and IL-8 (p<0.05) and up-regulated the expression of IL-10 and the Treg/IL-17 ratio (p<0.05).
Shokri et al., 2015	Animal models	Animal trials using 50 Wistar rats - Diabetic mice with Streptozotocin (STZ)	Iran 2106	Cinnamon with green tea	This study has shown that cinnamon and green tea reduced blood glucose levels in diabetic animals. The tea at doses of 50, 100 and 200 mg/kg reduced blood sugar.
Ghaneim et al., 2016	Animal models	Animal trials using 30 male Sprague Dawley rats - Diabetic rats with Streptozotocin (STZ)	Egypt 2016	Herbal tea from <i>Balanites aegyptiaca</i> fruits	The blood glucose level was significantly ($P<0.01$) higher in diabetic control rats than in normal control rats. <i>B. aegyptiaca</i> tea with concentration of 1.0 g/100 ml has achieved the main decline in the level of blood sugar compared to other tea solutions (0.25 and 0.5 g/100 ml). The most efficient concentration was 1.0 g/100 ml.
Wang et al., 2013	Animal models	Animal trials using 140 SD male rats	China 2013	<i>Cyclocarya paliurus</i> hypoglycemic tea	The study revealed that cyclocaryapaliurus ethanol and aqueous extract exhibited the similar antihyperglycemic effects in type 2 diabetic rats, and there were no significant differences between these two extracts. Both ethanol and aqueous extract inhibited the increase of blood glucose level at 60 and 120 min after glucose loading.

Sathiya bama & Muthunitha, 2021	Clinical study	Human trials 60 patients (30 control) Age above 40 years	India 2021	Ginger tea	The study revealed that there was significant improvement in the post test level of blood glucose in the experimental group which clearly infers that ginger tea on blood glucose level was found to be effective in reducing the level of blood glucose. The pretest mean score of blood glucose in the experimental group was 165.70 with standard deviation 19.54 and the post-test mean score of was 127.67 with standard deviation 14.55.
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DISCUSSION

A total of eleven previous clinical-based research studies were used with eleven different herbal teas to test their effectiveness in treating T2DM. Six of these eleven studies were performed on T2DM patients, and five studies were conducted on T2DM animal models. When comparing herbal tea to the more popular forms of tea (black tea, oolong tea, green tea, and white tea), herbal tea frequently has greater benefits in the management and cure of chronic illnesses such as T2DM (Ajuwon et al., 2018).

According to a research conducted by Zhang et al. (2019), with the aim of examining whether glucose management in people with T2DM is improved by drinking herbal tea, indicates that intake of herbal tea has a beneficial effect on glucose management in individuals with type 2 diabetes. When Ajuwon et al. (2018) looked at fermentation process rooibos extract, they discovered that it had a beneficial effect on glucose metabolism in type 2 diabetes. Cinnamon supplementation can lower blood glucose levels while leaving other glycemic and anthropometric markers unchanged (Namazi et al., 2019). In a recent study

demonstrated that Chamomile tea consumption significantly reduced insulin suggesting that improved insulin sensitivity may also lead to decreased blood glucose levels (Weidner et al., 2013). On the other hand, multiple studies have recently found that the occurrence of T2DM is linked to inflammatory activity in adipose tissue. This shows that the anti-inflammatory activity of shiso tea polyphenols reduces adipocyte inflammation and prevents the onset of diabetes (Kishi et al., 2010). The findings show that combining Kothala Himbutu tea with traditional diabetes treatment results in substantial reductions in HbA1C levels. The study found that Kothala Himbutu tea is an effective and safe treatment for T2DM (Jayawardena et al., 2015). Diabetea tea is a blend of powders from numerous medicinal plants that have traditionally been used as beverages in several Asian nations for diabetes and other ailments. Each herbal component of the diabetea tea mix mediates numerous anti-inflammatories and antihyperglycemic activities and increase synergistic reinforcement to optimal glucose metabolism (Mahmoud et al., 2016). According to recent research, in diabetic rats, *B. aegyptiaca* increased antioxidant enzyme activity and lowered

lipid oxidation. Furthermore, herbal tea made from *B. aegyptiaca* fruits has hypoglycemic, anti-hyperlipidemic properties and it ameliorated liver and kidney function associated with T2DM (Ghanem et al., 2016). Another research was conducted in India, when looking at the results of this study, there was a substantial improvement in blood glucose levels, implying that ginger tea on blood glucose levels was found to be helpful in lowering blood glucose levels among individuals with diabetes over 40 years old in the experimental group (Sathiyabama & Muthunitha, 2021).

CONCLUSION

Herbal tea is a popular beverage consumed in many nations and is a significant resource that requires in-depth study. It is developed from years of experience in the struggle against disease by ancestral people. Herbal teas, in general, are safe, effective, and taste good. When compared to typical forms of tea (black tea, oolong tea, green tea, and white tea), herbal teas often have higher benefits in the prevention and management of chronic diseases like T2DM. Indeed, the question of whether herbal medicine and tea have adjuvant therapeutic benefits for T2DM has been a hot topic of widespread concern. Herbal teas are rich sources of natural bioactive compounds, according to this systematic review, with unquestionable evidence of significant antidiabetic benefits from clinical trials. As a result, consuming them may lower the risk of T2DM and associated complications. However, it is unclear if herbal tea can combine the benefits of herbal medicine and tea to play an ideal role in the treatment of T2DM.

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ANTIMICROBIAL ACTIVITY OF CRUDE EXTRACTS FROM ENDOPHYTIC FUNGI ISOLATED FROM *NYPA FRUTICANS* AND *BRUGUIERA GYMNORRHIZA*

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ABSTRACT

Antimicrobial activity is a significant characteristic of the medical field that kills microorganisms or stops their growth to provide adequate protection against microorganisms and biological fluids. Recently, the increased drug abuse and rapid development of microbial resistance leading to search effective, cheap, safe and available therapeutics from numerous herbs for their antimicrobial effect. Mangroves are explored from ancient times as folklore medicine against different microbial infections. Several studies showed that endophytic fungi are one of the main sources of producing new antibiotics. This research shows the antimicrobial activity of crude extracts from endophytic fungi isolated from mangrove species against pathogens. This research shows the antimicrobial activities of endophytic fungal crude extracts isolated from leaves, husk and stem of *Nypa fruticans* and leaves, stem, roots of *Bruguiera gymnorhiza* taken from Ja-Ela canal and Negombo lagoons in Sri Lanka. The antimicrobial activity of these plant extracts was evaluated with minimal inhibitory concentration (MIC) values. The five endophytic fungi; *Penicillium notatum*, *Penicillium viticola*, *Aspergillus niger*, *Aspergillus flavus* and *Aspergillus terreus* exhibited positive antimicrobial activities against *Escherichia coli* and *Staphylococcus aureus*. *Aspergillus flavus* in *Nypa fruticans* husk showed the highest inhibition against *E. coli* which was 20.2 mm while *Penicillium notatum* in *Nypa fruticans* leaves showed it against *S. aureus* with a value of 22.5 mm. This study

provides evidence that the *Nypa fruticans* and *Bruguiera gymnorhiza* exhibited good antimicrobial activity that contribute to the discovery and innovation of new therapeutics.

Keywords: Antimicrobial activity, Microbial resistance, Minimum Inhibitory Concentration

INTRODUCTION

Scientists across the world are searching for living resources of lead compounds for the development of novel drugs to combat multidrug-resistant pathogens. The antimicrobial activity differs from geographical location, plant parts used, extraction method and protocols employed. This review will highlight the antimicrobial effect of endophytic fungi isolated from two mangrove species: *Nypa fruticans* and *Bruguiera gymnorhiza*. Mangroves are a taxonomically varied group of trees, shrubs, and fern species originated on tropical beaches in salty peaty soil and sheltered lagoons (Saenger, 2002). In Sri Lanka, mangroves can be found on the island along the coastal belt covering the areas around northern, eastern, southern, western and north-western coasts (Ranawana, 2017).

Nypa plants (*Nypa fruticans* Wurmb) (Figure 1) can only be found in a few river mouths in the Southern and Western provinces of Sri Lanka. Based on previous research, the ethanolic extract of mature *Nypa* leaves that has been formulated into

soap shows antibacterial action against *Staphylococcus aureus*. Secondary metabolites such as tannins, terpenoids,



Figure 1: General morphology of *Nypa fruticans* tree and the parts; (A) leaves , (B) husk and (C) stem (Chomicki et al., 2014)

Previous studies suggest *Bruguiera gymnorrhiza* may have antibacterial, antifungal, and antioxidant properties. This study aimed to explore the potential

Endophytic fungi in mangrove are unique plant endosymbionts that display a different environment and taxonomic affiliation (Kumaresan et al., 2021). Antimicrobial properties of this mangrove species can develop to produce antibiotics that kill or slow the spread of pathogenic microbes. These properties derived from natural sources can be further modified chemically and minimize their toxicity and enhance the activity to manufacture antimicrobial drugs (National Research Council (US), 1980). Bioactive compounds of these herbs are used as a starting point for antibiotic synthesis to treat diseases. Currently, antimicrobials use in medicines, to treat wound infections related to bacteria, agriculture, pharmaceuticals, to produce volatile organic compounds biodegradation and as natural preservatives for food spoilage (Atef et al., 2019). Thus, the main purpose of this project is to test the antimicrobial activity of crude extracts from endophytic fungi isolated from *Nypa fruticans* and *Bruguiera gymnorrhiza* against *Escherichia coli* and *Staphylococcus aureus* and to offer appropriate and efficient

alkaloids, and flavonoids found in *Nipah* (*Nypa fruticans*) have been examined in vitro for antibacterial activities.

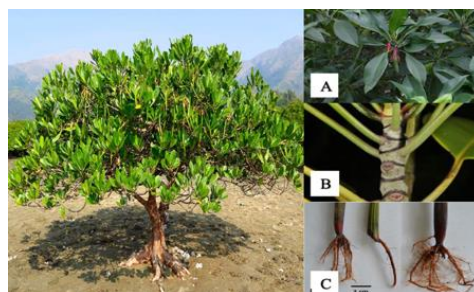


Figure 2: General morphology of *Bruguiera gymnorrhiza* tree and parts; leaves (A), stem (B) and root (C) (Kusmana et al., 2017)

antimicrobial drugs from its antimicrobial agents.

METHODOLOGY

The *Nypa fruticans* plant parts and *Bruguiera gymnorrhiza* plant parts were collected from Ja-Ela lagoon and Negombo lagoon. All the plant parts were then sterilized and stored in a refrigerator. Then these plant samples were cut into small segments and cultured in potato dextrose medium for 3-4 days. After 4 days of incubation fungal colonies were observed. Then the fungal colonies were identified under a microscope. A colony of each fungus type was sub-cultured and pure colonies were identified. With the crude extraction Antimicrobial Susceptibility Test (ABST), Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC) was determined. Then the observed data values were analysed by Microsoft Excel 2018.

RESULTS

Results identification of the microscopic view of endophytic fungi in mangrove samples

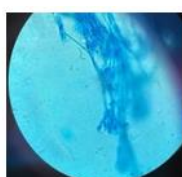


Figure 3: *Penicillium notatum* in *Nypa fruticans* leaf

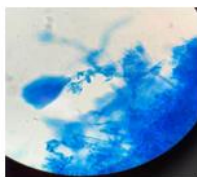


Figure 4: *Penicillium notatum* in *Nypa fruticans* stem

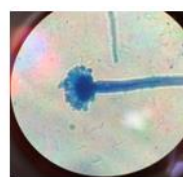


Figure 5: *Aspergillus flavus* in *Nypa fruticans* husk

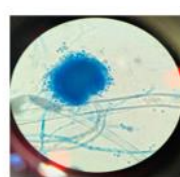


Figure 6: *Aspergillus niger* in *Nypa fruticans* husk



Figure 7: *Penicillium notatum* in *Bruguiera gymnorrhiza* Ja-ela cancell leaf

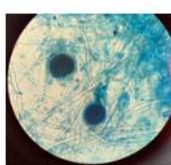


Figure 8: *Aspergillus niger* in *Bruguiera gymnorrhiza* Ja-ela cancell leaf

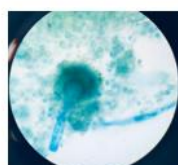


Figure 9: *Aspergillus terreus* in *Bruguiera gymnorrhiza* Ja-ela cancell stem.

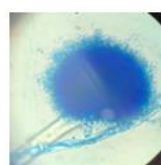


Figure 10: *Aspergillus niger* in stem of *Bruguiera gymnorrhiza* Ja-ela cancell

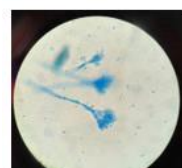


Figure 11: *Penicillium notatum* in stem of *Bruguiera gymnorrhiza* Ja-ela cancell

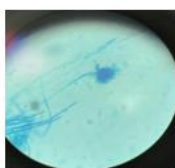


Figure 12: *Aspergillus terreus* in stem of *Bruguiera gymnorrhiza* Ja-ela cancell



Figure 13: *Aspergillus niger* in root of *Bruguiera gymnorrhiza* Ja-ela cancell



Figure 14: *Penicillium viticola* in root of *Bruguiera gymnorrhiza* Ja-ela cancell

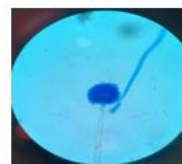


Figure 15: *Aspergillus niger* in leaf of *Bruguiera gymnorrhiza* Negombo lagoon

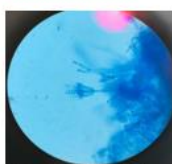


Figure 16: *Penicillium notatum* in stem of *Bruguiera gymnorrhiza* Negombo lagoon

Antibiotic Sensitivity Test (ABST) Results

Table 1: The inhibitory activity of the extracts against *E. coli* and *S. aureus* (S1; *Penicillium notatum* in *Nypa fruticans* leaf, S2; *Penicillium notatum* in *Nypa fruticans* stem, S3; *Aspergillus flavus* in *Nypa fruticans* husk, S4; *Aspergillus niger* in *Nypa fruticans* husk, S5; *Penicillium notatum* in Ja-ela cancell *Bruguiera gymnorrhiza* leaf, S6; *Aspergillus niger* in Ja-ela cancell *Bruguiera gymnorrhiza* leaf, S7; *Aspergillus terreus* in Ja-ela cancell *Bruguiera gymnorrhiza* stem, S8; *Aspergillus niger* in Ja-ela cancell *Bruguiera gymnorrhiza* stem, S9; *Penicillium notatum* in Ja-ela cancell *Bruguiera gymnorrhiza* stem, S10; *Aspergillus niger* in Ja-ela cancell *Bruguiera gymnorrhiza* root, S11; *Penicillium viticola* in Ja-ela cancell *Bruguiera gymnorrhiza* root, S12; *Aspergillus niger* in Negombo lagoon *Bruguiera gymnorrhiza* leaf, S13; *Penicillium notatum* in Negombo lagoon *Bruguiera gymnorrhiza* stem)

Mangrove Extract				Inhibition zone (cm)					
Plant species	Well number	Plant part	Endophytic fungi	<i>E. coli</i>			<i>S. aureus</i>		
				1 st trial	2 nd trial	Av g.	1 st trial	2 nd trial	Av g.
<i>Nypa fruticans</i>	S ₁	Leaf	<i>Penicillium notatum</i>	2.0	1.9	1.95	2.1	2.4	2.25
	S ₂	Stem	<i>Penicillium notatum</i>	1.2	-	1.2	1.3	1.3	1.3
	S ₃	Husk	<i>Aspergillus flavus</i>	1.95	2.1	2.02	1.6	1.5	1.55
	S ₄		<i>Aspergillus niger</i>	1.9	1.0	1.95	1.0	0.9	0.95
Ja-ela cannel <i>Bruguiera gymnorrhiza</i>	S ₅	Leaf	<i>Penicillium notatum</i>	1.6	-	1.6	2.2	2.3	2.25
	S ₆		<i>Aspergillus niger</i>	1.8	1.3	1.55	1.6	1.6	1.6
	S ₇	Stem	<i>Aspergillus terreus</i>	-	1.2	1.2	2.1	-	2.1
	S ₈		<i>Aspergillus niger</i>	1.2	1.3	1.25	-	1.7	1.7
	S ₉		<i>Penicillium notatum</i>	-	-	-	1.0	0.9	0.95
	S ₁₀	Root	<i>Aspergillus niger</i>	-	0.5	0.5	1.2	1.2	1.2
	S ₁₁		<i>Penicillium viticola</i>	1.7	-	1.7	2.3	2.5	2.4
Negombo lagoon <i>Bruguiera gymnorrhiza</i>	S ₁₂	Leaf	<i>Aspergillus niger</i>	1.6	1.6	1.6	2.0	1.8	1.9
	S ₁₃	Stem	<i>Penicillium notatum</i>	-	1.1	1.1	1.0	0.9	0.95

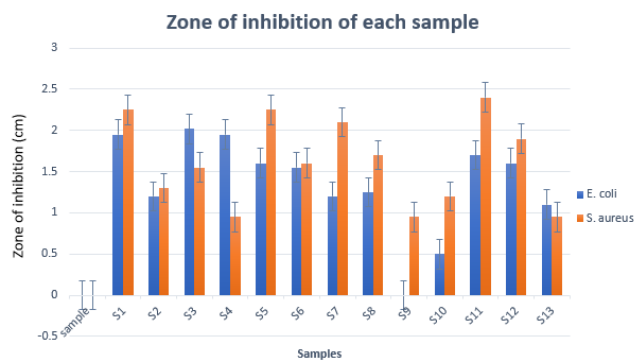


Figure 17: Comparative chart on zone of inhibition of the samples against *E.coli* and *S. aureus* with error bars

DISCUSSION

The results obtained in fungal isolation plates shows a long period (9-10 days) to grow endophytic fungi in mangrove leaves than husks, roots and stem. The research conducted by Koivusaari et al., 2019 demonstrated that altered leaf chemistry can affect to the delay of endophytic growth and leaves originating from the aquatic environment impairs the growth process than in terrestrial ecosystem. Nair and Padmavathi, 2014 found that matured leaves had greater number of endophytic colonization than those in the young leaves and their occurrence in leaves increased during rainy season (Nair and Padmavathi, 2014) (Koivusaari et al., 2019). In this research, mangrove plants are specifically taken due to its different environmental condition from common terrestrial (Li et al., 2019). This research investigated a total of two mangrove species collected from two different locations and five endophytic. This study shows that all the extracts obtained from the leaves, stem, root and husk parts of *Nypa fruticans* and *Bruguiera gymnorrhiza* have antimicrobial properties. The antibacterial activity of mangroves may be influenced by some factors such as the difference in geographical area, the season of sample collection, different growth stages of plant and experimental methods (Sahoo et al., 2012). Due to that *Bruguiera gymnorrhiza* was taken from two different locations: Jaela canal and Negombo lagoon to observe the difference. Most of the research articles confirmed that the extraction solvent in the preparation of samples has a significant role with the antimicrobial activity (Sreeram and Arunprasath, 2020). This research involves simple extraction methods with low production costs which used agar well

diffusion techniques with micro-dilution assay (MIC and MBC) against gram positive bacteria (*Staphylococcus aureus*) and gram-negative bacteria (*Escherichia coli*). The highest zone of inhibition observed in this experiment was *Nypa fruticans* husk against *E. coli*. *Staphylococcus* isolates exhibited good resistance against *Penicillium notatum*, *Penicillium viticola*, *Aspergillus terreus*, *Aspergillus niger* and *Aspergillus flavus*.

Further, this result collaborates with Lotikar and Samant, 2015 which states that the inhibitory activity observed for gram positive bacteria is much higher compared to gram negative bacteria. Most gram-positive bacteria are surrounded with a peptidoglycan cell wall. This structure mechanically strong and appear to offer little resistance to the diffusion of small molecules such as antibiotics (Atef et al., 2019). In minimum inhibitory concentration determination for *E. coli* and *S. aureus* dilution series, the final tubes with no visible turbidity were the last three tubes. So, the MBC was performed by using each of those last three tubes. In MBC, failure of the organism to grow on the plate within 24 hours period indicate low CFU values.

CONCLUSION

Antibiotic resistance is becoming more common due to indiscriminate. So, it is important to discover antimicrobials to combat resistant strains with different chemical compositions and novel mechanisms of action.

The research reviewed *Nypa fruticans* and *Bruguiera gymnorrhiza* as promising herbal plants with wide range of antimicrobial activities which could be utilized in the manufacture of mangrove based pharmaceutical products in near

future because of its effectiveness and safety.

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LITERATURE REVIEW OF MUD THERAPY AND NATURE CURE TECHNIQUES

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ABSTRACT

Ayurveda emphasizes that the panchamahabhutas which are named as Apo (Water) Tejo (Fire), Vayo (Air), Patavi (Earth) and Akash (Space) are the universal basic creative materiality. According to Ayurveda our body is also made up of panchamahabhuta. The diseases are manifesting due to the imbalance of our dosic condition which results, defaults of consuming unwholesome foods and habits. Intrinsic healing power of Nature cure techniques to prevent and cure the diseases of human being by using of natural substances available in nature is the science of nature cure. So this self-healing system is very simple, cost effective and fruitful of recovering diseases. Hydrotherapy, Heliotherapy, Pranayama, Mud therapy and fasting represents as some aliments of the nature cure. Among these, mud therapy is one of the most effective method and beneficial therapeutic method for detoxifying, reducing inflammatory action, improving blood circulation, giving cooling effect to the body, healing of wound, enhancing lymphatic flow and cleansing the skin. The use of mud therapy as cosmetic, therapeutic, nutritional and basic health care purposes origins from ancient Egypt, Mesopotamian and Roman times and has been recorded before 2500 BC. Even though mud therapy is an ancient therapeutic validity it is still been used on incurable diseases as miracles where even modern medicine find it difficult to cure. The objectives of a systemic review of mud therapy and nature cure techniques are based on its antiquity, clinical effectiveness, rejuvenating qualities and safety.

Key words: Panchamahabhuta, Mud therapy, nature-cure techniques, antiquity, rejuvenation

OILS USED FOR TREATMENT IN SRI LANKAN TRADITIONAL TAMIL MEDICINE – A REVIEW

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ABSTRACT

Oils are used for food preparation and pharmaceutical manufacturing. Different oil formulations are frequently used in traditional medical systems, particularly Tamil medicine, to treat diseases. Sri Lanka has a great assortment of Tamil medical literature. Hence, our review aimed to study the types of oils utilized in Sri Lankan traditional Tamil medical literature (STTML) to prepare the therapeutic oils with treatments. Combining the terms traditional medicine, Siddha medicine, and oils were used to conduct a literature survey utilizing the electronic databases. In addition, data was gathered from printed STTML. Nine STTML and 20 journals were selected. The literature documents 423 types of therapeutic oil for 57 types of diseases. Eleven types of oil are used to prepare these 423 types of therapeutic oils. Of these 423 oils, adult and pediatric diseases were treated with 389 and 34 oils, respectively. Gingelly oil was used to prepare 72.58% (307 types) of therapeutic oils, followed by neem (26.48%) and castor oil (24.59%). Mustard, Pongamia, Tamanu oil, etc., were used to prepare < 7%. The majority (23.88%) of these oils were used to treat otolaryngology, brain, and dental diseases ($p < 0.001$), followed by rheumatic diseases (21.04%) and skin diseases (20.09%). In addition, the gingelly oil is mainly used to prepare therapeutic oils for internal (10.40%), external (47.51%), or combined (19.95%) treatments, followed by castor (8.27%) and neem oil (16.78%), which are used internally and externally respectively. Gingelly oil is commonly used in the Sri Lankan traditional medical system to prepare and treat diseases for all ages.

Key words: Oils, Sri Lanka, Traditional medicine

SITE-SPECIFIC DOCKING AGAINST HEPATITIS B PROTEIN USING AUTODOCK 4.2.6.

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ABSTRACT

The hepatitis B virus (HBV) is one of the major causes of liver diseases. There are several interventions to manage the condition, but no effective cure. In silico screening is an excellent tool to discover novel drug candidates to treat HBV. In this study site-specific protein-ligand docking was performed using Autodock 4.2.6. to determine phytochemicals that can target the hepatitis B core (HBc) protein (PDB ID:5WRE). Ten phytochemicals (sanggenol O, helioxanthin, curcumin, nirtetralin, neolancerin, dehydrozingerone, LPRP-ET-97543, myricetin-3-o-rhamnoside, quercetin-3-o-rhamnoside and kaempferol) were selected and a clinical trial drug (NVR-3-778) was used as a standard. When docking a grid box was created, where its xyz-dimensions were 60 each, grid spacing was 0.5 and genetic algorithm runs was set to 50. Re-docking was conducted to validate the procedure. The ligands were evaluated based on their binding energies (BE) and inhibitory constants (Ki). The best-docked poses and amino acid interactions were visualized using BIOVIA Discovery Studio. Moreover, SwissADME was used to analyze the pharmacokinetic properties. The best-docked phytochemicals were sanggenol O, helioxanthin and LPRP-ET-97543 as they had the lowest BE's of -9.73kcal/mol, -8.67kcal/mol and -8.18kcal/mol respectively while their Ki's were 0.07416 μ M, 0.43846 μ M and 1.01 μ M, respectively. The re-docked BE was -10.19kcal/mol. The common amino acids interactions observed were TYR118, VAL124, LEU140 and PHE110. Furthermore, these phytochemicals conformed to Lipinski's criteria and showed high gastrointestinal absorption indicating that they have a good bioavailability. In conclusion these three phytochemicals displayed stable BE's, potent Ki's and conformed to Lipinski's criteria suggesting that they are suitable ligands for therapeutic use.

Key words: Hepatitis B core (HBc) protein, Site-specific docking, Binding energy (BE), Inhibitory constant (Ki), Lipinski's criteria

**OBSERVATION OF ANTIOXIDANT, ANTIMICROBIAL AND
PHOTOCATALYTIC PROPERTIES OF GREEN SYNTHESIZED SILVER
NANOPARTICLES PRODUCED USING EXTRACTS OF COCOS NUCIFERA
LEAVES**

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ABSTRACT

Antioxidant based research has been on the forefront recently, due to its effects in cancer and aging processes. Silver nanoparticles produced by the green synthesis pathway, has shown to have antioxidant, antimicrobial and photocatalytic properties, enabling them to be used in various medical and industrial applications. In this project, silver nanoparticles were synthesized using coconut leaf extracts of 6 varieties of coconut; ran thambili, porapol, tall typica, gon thambili, green dwarf and bodiri. The nanoparticles were visualized using the UV spectrophotometer in all varieties, where peaks were observed between the wavelengths of 400 nm to 480 nm, optimized at 90°C for 30 mins. A brown colouration observed in the solution caused by the surface plasmon resonance phenomenon indicated the successful synthesis. The synthesized nanoparticles were then assessed for their antioxidant properties using the assays, total flavonoid content (TFC), total phenolic content (TPC), total antioxidant content (TAC) and DPPH scavenging assay. Results prove that nanoparticles have a higher antioxidant content compared to their respective water extracts. The photocatalytic activity of 266 ppm and 4000 ppm ran thambili nanoparticle was observed against malachite green dye, under UV and sunlight. The dye was observed to degrade with 266 ppm within 60 mins under UV without catalyst and with 4000 ppm within 120 mins. under sunlight in the presence of catalyst NaBH₄. Their antimicrobial activity was observed against Escherichia coli and Staphylococcus aureus. However, no significant difference was observed between the respective water extracts and the nanoparticles. Furthermore, all nanoparticles were identified to be semi-conductors. Thus, it can be observed that the produced nanoparticles have various medical and industrial applications.

Keywords: Nanoparticles, antioxidants, coconut leaves, green synthesis

EXTRACTION OF ESSENTIAL OILS FROM CLOVE BUD (SYZYGIUM AROMATICUM), AND CEYLON CINNAMON (CINNAMOMUM ZEYLANICUM), AND THE DETERMINATION OF THEIR ANTIBACTERIAL ACTIVITY ON STAPHYLOCOCCUS AUREUS AND ESCHERICHIA COLI

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ABSTRACT

In recent times, bacteria have been shown to display acquired resistance against antibiotics that were previously effective in treating pathogenic infections caused by such bacteria, by altering their metabolic processes, cellular structure and genetic material. In a bid to combat this drug resistance, the use of natural sources of antibacterial agents have been explored, and essential oils of herbs and spices offer a potential outlook. Clove bud (*Syzygium aromaticum*), and Ceylon Cinnamon (*Cinnamomum zeylanicum*) are spices that are commonly used in Sri Lankan households, especially in the preparation of food. The objective of this study was determining the antibacterial activity of these essential oils individually, and in combination with antibiotics, against *Staphylococcus aureus* and *Escherichia coli*, two commonly found species of bacteria which have also been found to show antibiotic resistance. The spices were dried and processed to obtain a fine powder, followed by hydrodistillation to obtain the essential oil. The antibacterial activity of the essential oil alone, and in combination with Ciprofloxacin and Chloramphenicol were determined using the disc diffusion. The effect of storage on the antibacterial activity of the essential oils were also determined by storing extracted oils for 7 days. Results showed clove bud and cinnamon essential oils to possess antibacterial activities alone, as well as in combination with the tested antibiotics. Results also showed an overall reduction in the antibacterial activity of the 7 day-stored essential oil than the fresh essential oil sample.

Keywords: Antibacterial activity, *Cinnamomum zeylanicum*, *Escherichia coli*, *Staphylococcus aureus*, *Syzygium aromaticum*

GREEN SYNTHESIS OF SILVER NANOPARTICLES USING SIX VARIETIES OF HIBISCUS ROSA-SINENSIS LEAF EXTRACTS: EVALUATION OF ANTIOXIDANT ACTIVITY, ANTIBACTERIAL ACTIVITY AND PHOTOCATALYTIC PROPERTIES

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ABSTRACT

The production of nanomaterials through nanotechnology have aided in the advancement of healthcare and therapy. Silver nanoparticles (AgNPs) are being employed in a variety of fields, due to its distinctive physical and chemical characteristics. The present study endeavour the green synthesis of AgNPs from the medicinally significant 'Hibiscus rosa sinensis' leaves to determine its antioxidant, antimicrobial and photocatalytic properties. 1mL of water extract was mixed with 9mL of silver nitrate and was optimized at 90oC for 60 minutes to gain nanoparticles. The colour change from colourless to brown and the absorption peak obtained between 400-480nm using UV-Vis spectrophotometer, indicated the formation of AgNPs. The occurrence of the peak is due to the phenomenon Surface Plasmon Resonance effect. The synthesized yellow AgNPs was characterized using Scanning Electron Microscopy and it was observed that yellow AgNPs were spherical in shape and 40nm in size. Synthesized AgNPs showed higher antioxidant activity by showing a significant correlation between the Total Flavonoid Content, Total Phenolic Content and Total Antioxidant Content assays conducted. The antimicrobial activity of water extracts and AgNPs were investigated against Escherichia coli and Staphylococcus aureus and results depicted a clearly noticeable inhibition zone. Photocatalytic activity of Yellow AgNPs were measured using Methyl Orange. 267ppm yellow sample exhibited higher degradation by completely degrading within 60 minutes whereas, the 4000ppm yellow sample required 90 minutes. The results imply that hibiscus has the potential to develop new medicines that help to lessen various free radical induced diseases due to its high antioxidant and antimicrobial activity.

Keywords: Nanotechnology, Silver nanoparticles, Hibiscus rosa sinensis

PROTEIN-LIGAND DOCKING STUDIES TO DISCOVER PHYTOCHEMICALS TO TREAT ISCHEMIC STROKE USING AUTODOCK AND VINA

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ABSTRACT

Globally, Ischemic stroke is an onerous disease which is the foremost reason for permanent disabilities and second leading cause of morbidity. Prevailing current treatments are restricted to anti-platelet therapy and thrombolytic agent which may pave a way to haemorrhagic condition. Antagonism for PAF-R and S1R has become a novel therapeutic strategy for ischemic stroke. In this study, phytochemicals retrieved from NCBI PubChem were computationally docked with Autodock 4.2.6, and vina through preparation of protein and ligands to be utilized as antagonist candidates. Blind docking and site-specific docking were carried out in Autodock by generating *.gpf and *.dpf files. In vina, *.BAT file was created to execute docking for phytochemicals in a single config.txt file. Based on binding energy, Inhibition constant and binding affinity, the phytocompounds were short-listed and further filtered based on ADMET properties including the Lipinski's Rule of Five which were verified by ADMETlab 2.0 webtool. Validation was executed with the redocking value of -9.9 kcal/mol. Interactions between receptor and the ligands were observed in BIOVIA DS and Ligplot+. Blazeispirol X and Puberulin showed the higher docking score in Autodock (-11.76 and -11.2 kcal/mol) vina (-12.1 and -11.7 kcal/mol) and lower inhibition constant (6.60 and 8.33 nM) than the other phytochemicals and accepted the Lipinski's Rule, BBB penetration and Caco-2 permeability. The following amino acid residues were identified as common in binding pocket: PHE 174, PHE 97, LEU 279 and TRP 73. Future research can be performed based on this study to uncover key phytochemicals to treat ischemic stroke. (250 words)

Keyword: Docking, PAF-R, S1R, *.BAT, Lipinski's Rule

**IDENTIFICATION OF ENDOPHYTIC FUNGI ISOLATED FROM TRUE
MANGROVE SPECIES: *RHIZOPHORA MUCRONATA*, *RHIZOPHORA MANGLE*
AND *SONNERATIA CASEOLARIS* IN SRI LANKA**

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ABSTRACT

Mangroves are high salt-tolerant woody shrubs and trees grow in water-logged soils of estuaries, sheltered lagoons and bays in tropical zones worldwide. Endophytic fungi in different mangrove species which produce bioactive metabolites were identified in previous studies. The focus of this research is to discover the endophytic fungi that are present in the leaf, bark, and root tissues of *Rhizophora mangle*, *Rhizophora mucronata* and *Sonneratia caseolaris* in Sri Lankan lagoons. The samples were collected from Negombo lagoon and Bolgoda lake. The samples were inoculated and subcultured on potato dextrose agar medium, and the identification of endophytes was conducted by morphological and microscopical analysis methods. In this study, four isolated species of fungal endophytes obtained from nine mangrove samples. *Aspergillus niger* was isolated from the leaf, bark, and root tissues of *Rhizophora mangle*, and *Rhizoctonia solani* was obtained from the bark, leaf, and root tissues of *Sonneratia caseolaris*. *Aspergillus niger* was discovered in the bark tissues, and *Aspergillus ochraceus* was isolated from *Rhizophora mucronata*'s root tissues. From the leaf tissues of the *Rhizophora mucronata*, *Penicillium chrysogenum* was isolated. Compared to the *Sonneratia caseolaris*, *Rhizophora* spp. produced a greater number of significant endophytic fungal species. *Rhizoctonia solani* isolated from *Sonneratia caseolaris* was identified as pathogenic fungi species for the mangrove plants. Therefore, true mangroves are identified as a source of significant fungal endophytes. Using molecular and microbiological analysis techniques, this research could be expanded to investigate the antimicrobial, anti-cancer, and antioxidant effects of fungal metabolites.

Key words: Endophytes, *Rhizophora* spp, *Sonneratia caseolaris*

IDENTIFICATION OF EFFECTIVE PHYTOCHEMICALS AGAINST NON-SMALL LUNG CANCER RECEPTOR USING AUTODOCK 4.2.6 SITE-SPECIFIC TECHNIQUE

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ABSTRACT

Lung cancer is a disease in which malignant cells develop in the tissues of the lungs, with an estimated 2 million diagnoses in 2020. Currently, no available drug can cure lung cancer, with no adverse side effects. This study was performed, to establish phytochemicals that can target the EGFR receptor tyrosine kinase domain with 4-anilinoquinazoline inhibitor erlotinib (PDB ID: 1M17), which was retrieved from RCSB PDB. 3D structures of 15 phytochemicals, were then retrieved using PubChem. ADMETlab 2.0 was also used to apply Lipinski's rule of five to examine the drug-likeness property. Receptor-Ligand specific-docking was performed using Autodock 4.2.6. The grid box parameters were set by choosing the active amino acid residues in the binding pocket retrieved using CASTp (ASP783, ASN784, GLN958, ARG962, MET963, HIS964, LEU977, MET978, ASP979, GLU980, ASP982, MET983, ASP984, and VAL986) of the receptor and the center grid box values; X (20.663), Y (0 4.2060), and Z (56.92). BIOVIA DS and chimera were used to determine the interactions and docking poses. Furthermore, validation was performed by redocking and obtaining a BE value of -6.15 kcal/mol. The effectiveness of the phytochemicals was gleaned from binding energy (BE) and inhibition constant (Ki). The best phytochemical of the 15 observed in this study was Ursolic acid based on BE, Ki, drug-likeness, and other scores (BE: -12.56 kcal/mol, Ki: 620.13 pM). Other prospective phytochemicals are Phytosterols (BE: -9.87 kcal/mol), Nimbolide (BE: -7.95 kcal/mol), and Sparstononin-B (BE: -7.01 kcal/mol). Thus, these phytochemicals could be used to develop anti-cancer drugs, without any detrimental effects. (250 words)

Keywords: Lung Cancer, tyrosine kinase domain with 4-anilinoquinazoline inhibitor erlotinib, Anti-cancer, Site-specific, Docking, Ursolic acid, EGFR

SEVERITY OF CONSEQUENCES RELATED TO DRUG ABUSE AMONG INDIVIDUALS ENROLLED IN RESIDENTIAL REHABILITATION, IN SRI LANKA

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ABSTRACT

Substance abuse is a significant problem and a major public health challenge worldwide. It creates physical, mental, social, and economic consequences that affect individuals, families, and the community. Detection of the severity of consequences related drug abuse is needed in diagnosis and treatment of individuals with substance use disorder (SUD). The study aimed to determine the severity of consequences related drug abuse among individuals who enrolled in residential rehabilitation. A descriptive cross-sectional study was conducted among 283 individuals who enrolled in six selected residential rehabilitation centers in Sri Lanka. The severity of consequences related drug abuse was measured using the Drug Abuse Screening Test (DAST-10). The level severity was classed as no problems reported (0), low level (1-2), moderate level (3-5), substantial level (6-8), severe level (9-10) based on the DAST 10 score. Descriptive statistics and Pearson correlation were performed using IBM SPSS version 26. Ethical approval was obtained from the Ethics Review Committee of the KIU (KIU_ERC_20_49). The mean age of the study participants was 29±7 years. The majority (98.9%, n=280) were males and 54.8% (n=155) were educated up to ordinary level. The mean duration of drug use was 7±6 years. All the participants were poly drug users and heroin (77.4%, n=219), amphetamine (14.8%, n=42) and cannabis (8.8%, n=25) were the commonly used substances. The mean DAST-10 score was 7.0±1.5 (range 1-10). Most of the participants (67.1%, n=190) reported a substantial level of severity of consequences while others reported low (0.7%, n=2), moderate (13.8%, n=39), and severe (18.4%, n=52) levels respectively. Considerable number of individuals faced severe consequences related drug abuse which require intensive assessment and long-term continuum of care.

Key words: Residential treatment, Substance use disorder, DAST-10

SEIR MODEL FOR COVID 19 DYNAMICS IN SRI LANKA

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ABSTRACT

The novel corona virus infection is an ongoing threat to most of the countries in the world. We still have significant gaps in our understanding of Covid-19 epidemiology, transmission dynamics, investigation techniques and management, despite the fact that the outbreak is an unprecedented worldwide hazard. But there is currently enough knowledge about the epidemic process to allow for the development of mathematical forecasting models. Our study dealt with mathematical modeling, model verification and numerical simulation for Covid-19 dynamics in Sri Lanka. Model verification was performed to calibrate system parameters. Parameter estimation was done by least squares minimization method in Python and graphs were plotted using MATLAB. The model's capacity to predict infectious evolution is demonstrated by the results. Here we used 2 models to study dynamics of Covid-19 outbreak in Sri Lanka based on efficiency of controlling the spread of infectious disease in 2nd and 3rd waves of Covid-19 outbreak. The findings highlight the importance of governmental and individual initiatives in limiting the frequency and duration of pandemic-related critical circumstances. And two of the models have predicted peak points for infected population close to actual points.

Keywords: Covid 19, mathematical modeling, SEIR model, epidemiology

ASSOCIATION BETWEEN FORMAL SECTOR EMPLOYMENT AND POVERTY LEVEL OF A FAMILY

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ABSTRACT

Poverty reduction is a crucial challenge faced by many countries in the world including Sri Lanka. Since the employment of a person significantly affects the reduction of poverty, this research tries to identify the dependence of the sector of the employment of a family member to reduce the poverty of the family. The employment is separated into formal sector and informal sector using the definitions given by Department of Census and Statistics (DCS) in Sri Lanka. The households which are sampled by “household income and expenditure survey” and “labour force survey” by DCS are used for the research considering families as observation units excluding boarders and servants. Each observation unit is weighted using sampling weights and remedies are used to balance the data. Poverty level is predicted using “Binary Logistic Regression with Lasso”, “Random Forest”, “Bagging” and “Boosting” methods. Out of these methods “Random Forest” is identified as the best classification method based on the accuracy. Odds ratios are used to identify the associations between sector of the employment and the poverty level. It resulted that the odds of a family being poor is decreased by 13% for an additional member involvement to the formal sector employment. Moreover, that the odds of a family being poor is increased by 23% for an additional member involvement to the informal sector employment compared to the formal sector. The methods Random Forest, Bagging and Boosting resulted the number of the informal sector workers in a family is more important than the number of formal sector workers in a family when predicting the poverty level based on the mean decrease in Gini Index. Among all the factors used district of the residence, per capita income, count of single members in a family, count of members whose education level is under Ordinary level, number of unemployed members and count of members with lower ability in Sinhala and Tamil languages are highlighted as the most important factors in predicting the poverty level of a family.

Keywords: Formal Sector, Poverty, Random Fores

REGRESSION-BASED MODELING OF THE RELATIONSHIP BETWEEN WEATHER AND TEA PRODUCTION IN SRI LANKA

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ABSTRACT

The research shows the implementation of regression-based tea-weather prediction model for the tea production of Sri Lanka with weather parameters such as rainfall, minimum temperature, maximum temperature, humidity, average wind speed, cloud cover and average sunshine hours. The eight agro climate geographical regions of the UVA province, which contribute to the more productive contribution of tea production. This research and the consequence of weather parameters on the tea production was explored with Random Forest algorithm with variable effect by correlation in the middle of the climate parameters were determined. The results indicate that the Humidity, Rainfall, Maximum Temperature and Cloud cover throughout the tea plantation period are the most significant weather parameters. Furthermore, regression analysis implementations were applied for the Random Forest (RF), Linear Regression (LR), Support Vector Machine (SVM) and Multiple Linear Regression (MLR). According to results, RF is the most accurate and dependable model of the prediction of tea production in the country. UVA province prediction model accuracy (R square score) is 88.58% of the eight agro climate districts of the UVA province and region-wise prediction. Further RF, MLR and SVM, Machine Learning implementation already trained and validated for the same dataset. Although the results indicated that other model's low percentage in comparison to the RF model. The research regression analysis already applied for RF and LR for the region-wise of the UVA province Sri Lanka. The final output of the research can be applied to the tea- weather prediction model of the tea growing areas.

Key words: Agro climate, Regression model, Random Forest, Tea production, Teaweather

FACTORS AFFECTING THE PREVALENCE OF THALASSEMIA DISEASE IN SRI LANKA: WITH SPECIAL REFERENCE TO KURUNEGALA DISTRICT

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ABSTRACT

Thalassemia is a genetic disease that causes abnormal hemoglobin. According to records, thalassemia disease affects millions of people worldwide including Sri Lanka. A recent island-wide survey revealed that there are approximately 2000 patients with thalassemia in Sri Lanka and it is estimated that nearly 80 new patients are born each year. The highest frequency has been found in Kurunegala district. Therefore, this study is mainly focused to investigate the factors that affect the prevalence of thalassemia in Kurunegala district in Sri Lanka. A sample was drawn using the convenience sampling method. The study was conducted using a quantitative approach and a questionnaire survey. Descriptive statistics and binary logistic regression were used to achieve the objectives. According to the descriptive statistics, the consanguinity rate among the parents of patients with thalassemia was 15%, compared with the general population rate of 7%. Awareness of thalassemia was only indicated by 31% of the parents of patients with thalassemia. Binary logistic regression has found that the parental consanguineous marriages, the parents' awareness of thalassemia and the premarital screening are significant factors for having thalassemia disease. Further, this study suggested that the most effective way of eliminating the disease is creating public awareness through effective methods of education, emphasizing that it is a preventable disease by introducing screening programs for carrier detection at a national level. These findings should alert the authorities to take serious preventive measures to address the issue.

Keywords: consanguinity, genetic disease, thalassemia

PROTEIN-LIGAND DOCKING TO IDENTIFY POTENTIAL PHYTOCHEMICALS AGAINST BREAST CANCER PROTEIN RECEPTOR USING AUTODOCK

Humaid Luthufi, Heshani Mudalige, Ominda perera

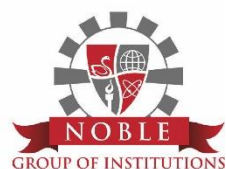
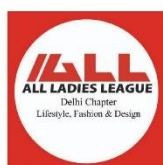
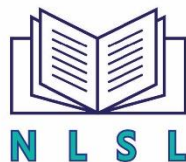
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ABSTRACT

Breast cancer is the most common cancer diagnosed among women worldwide with more than 2 million new cases estimated in 2021. Both hormone-dependent and hormone-independent breast cancers have a strong relationship with the estrogen receptor α (ER α). This study has been performed based on current therapy to target the hormone receptor ER α using phytochemicals. The 3D structure of ER α (PDB ID: 3ERT) was retrieved from Protein Data Bank and docked with 3D structures of phytochemicals retrieved from PubChem. Drug-likeness property was analyzed by applying the Lipinski's rule of five using ADMETlab 2.0. Receptor-Ligand site-specific docking was performed using Autodock 4.2.6. In site-specific docking, grid box parameters were set by targeting the common active amino acid residues in the binding pocket retrieved using CASTp (LEU346, ARG394, ALA350, LEU384, LEU387, PHE404, ILE424, HIS524) of the receptor with center grid box value; X= 31.371, Y= -1.046, Z=20.174 and spacing= 0.375Å. Docking poses and interactions were generated using UCSF Chimera and BIOVIA DS respectively. Then validation was carried out by performing redocking and obtained a value of -10.17 kcal/mol. This study based on binding energy, docking energy, drug likeness and other scores confirm that Daidzein has the best binding energy of -8.58kcal/mol and inhibition constant of 0.509uM out of the 20 phytochemicals used in this study. Other potential lead phytochemicals such as glycitein, genisten, curcumin, bergamottin, kaempferol and lignans (-8.55, -8.51, -8.48, -8.28, -8.04, -8.03 kcal/mol respectively) can be used to develop anti-therapeutic drugs for the treatment of breast cancer with lesser adverse effects.

Keyword: ER α , Site-specific, Lipinski's rule, Daidzein

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06 th International Conference on Peace and Conflict Management		
12 th International Conference on Health and Medicine	Colombo, Sri Lanka	16 th - 17 th December 2022
06 th International Conference on Sociology & Law		
10 th International Conference on Ayurveda, Traditional Medicine, Siddha, Unani and Medicinal Plants		
06 th International Conference on Community Medicine and Public Health	Warsaw, Poland	03 rd - 04 th February 2023
14 th International Conference on Social Science and Humanities	Cluj-Napoca, Romania	08 th - 09 th February 2023
06 th International Conference on Engineering, Science and Technology	Sofia, Bulgaria	14 th - 15 th February 2023
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